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GIORNALE ITALIANO DI MEDICINA RIABILITATIVA

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Indice

ORAL PRESENTATIONS

1 **PREVALENZA E FATTORI PREDITTIVI DI DISABILITÀ NELLA FASE ACUTA POST-CHIRURGIA MAMMARIA**
E. Andrenelli, M. Capecci, M. Marchegiani, F. Fiori, L. Di Biagio, F. Grassi, MG Ceravolo

3 **SELECTIVE REHABILITATIVE PROTOCOL RELATED TO GRAFT CHOICE FOR ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION**
M. Bacchini, C. Rovacchi, M. Rossi

6 **STABILIZZAZIONE SPINALE CON DUE BIOFEEDBACK: UN NUOVO TRATTAMENTO RIABILITATIVO NELLA LOMBALGIA**
G. Brugnoni

8 **CONGENITAL MUSCULAR TORTICOLLIS: A DESCRIPTIVE ANALYSIS**
A. Campolargo, E. Gomes

10 **L'INDAGINE RADIOGRAFICA NEI TRAUMI LIEVI DEL RACHIDE CERVICALE: REVISIONE DELLA LETTERATURA E PROSPETTIVE DI VALUTAZIONE IN PRONTO SOCCORSO**
M. Cerrato, C. Gaido, I. Carnino, A.M. Federico, G. Gays, A. Vannicola, E. La Marmora, A. Bistolfi, M.V. Actis, G. Massazza

12 **TREADMILL ANTIGRAVITAZIONALE E PAZIENTI ANZIANI CON FRATTURA DI FEMORE: PERCORSI RIABILITATIVI A CONFRONTO**
T.M.J. Colafelice, O. Toscano, N. Lioi, G. Vastola, P. Fiore, F. Marrazzo, V. Santarsiere, S. Larocca

15 **LA VALUTAZIONE POSTURALE NELLE PAZIENTI CON LINFEDEMA DELL'ARTO SUPERIORE DOPO INTERVENTO PER NEOPLASIA MAMMARIA CON SVUOTAMENTO ASCELLARE**
F. Coppadoro, F. Beacco, A. Bertrand

17 **WHICH EFFECTS ON SPASTICITY AFTER FES GAIT TRAINING IN SPINAL CORD INJURY PERSONS?**
G. De Maio, C. Pinzini, A. Baldissera, E. Bizzarini, B. Mastromarino, C. Moschioni, C. Malisan, S. Specogna, A. Zampa

20 **MUSICTHERAPY IN AQUATIC ENVIRONMENT AND PAEDIATRIC REHABILITATION**
A. De Serio

22 **OBSERVATIONS ABOUT A MUSICTHERAPY TREATMENT FOR A GROUP OF PATIENTS IN VEGETATIVE STATE**
A. De Serio, D. Forenza

25 **CORRELATION OF URETHRAL PRESSURE PROFILOMETRY WITH CLINICAL MEASURES OF URINARY INCONTINENCE SEVERITY AND PELVIC FLOOR MUSCLE PERFORMANCES IN WOMEN WITH NON NEUROGENIC URINARY INCONTINENCE**
C. Delneri, L. Iona, T. Giorgini, A. Zampa, T. Tesan, P. Di Benedetto

27 **SECONDARY AND TERTIARY PREVENTION IN THE MANAGEMENT OF PATIENTS WITH STROKE AFTER DISCHARGE FROM INTENSIVE REHABILITATION: SCIENTIFIC EVIDENCE AND EPIDEMIOLOGICAL STATISTICAL ANALYSIS OF OUR EXPERIENCE**
D. Ferrucci, A. Corbisiero, D. Sicari, A. Forte, L. Di Lorenzo, C. Foti

30 **DYNAMIC ANTI-EQUINUS ORTHOSIS (A.DYN.O.) IN IDIOPATHIC TOE-WALKERS**
G. Di Rosa, F. Mattogno, R.Rosellini, E. Di Stanislao

32 **REVISIONE DELLA LETTERATURA SUL TRATTAMENTO CRUENTO, CONSERVATIVO E RIABILITATIVO NELLE LESIONI DEL TENDINE D'ACHILLE**
A.M. Federico, A. Vannicola, I. Carnino, C. Gaido, G. Gays, M. Cerrato, E. La Marmora, L. Morino, R. Cerlon, S. Ferrero, A. Bistolfi, M.V. Actisì, G. Massazza

34 **CORRELATIONS BETWEEN CHIARI II MALFORMATION AND BRAINSTEM AUDITORY EVOKED POTENTIALS (BAEPS) IN INFANTS WITH MYELOMENINGOCELE**
L. Foggia, M. Colucci, O. D'adddio, M. R. Bisogno, F. Crispino, R. Gigante

36 **LINFEDEMA POST MASTECTOMIA, IL RUOLO DEL BRACCIALE ELASTOCOMPRESSIVO IN ASSOCIAZIONE AL TRATTAMENTO DECONGESTIONANTE COMPLESSO**
A. Giovagnoli, R. Tominz, G. Pasqua, M. Savron, E. Fragiacomo

38 **EFFECTIVENESS OF SHOCK WAVE THERAPY IN THE TREATMENT OF CHRONIC TENDINOPATHIES AND LONG BONE NON-UNIONS**
E. Ilieva

41 **SINERGISMO D'AZIONE TRA PROTOCOLLO RIABILITATIVO ED ANTI-TNFα VERSUS TERAPIA BIOLOGICA**
L. Lauricella, D. Scaturro, C. Asaro, G. Letizia Mauro

44 **NEOPLASTIC SPINAL CORD INJURY: WHERE DOES REHABILITATION STAND?**
I. Lucas, M. Torres, P. Margalho, J. Laíns

46 **PERSONA CON DISABILITÀ: UN PROGETTO RIABILITATIVO INCOMPIUTO?**
N. Mastrapasqua, V. M. De Tommasi, M.C. Labartino, L. Bruno

48 **PROGRAMMA DI ADDESTRAMENTO PER LA PERSONA MIELOLESA E IL CAREGIVER**
E. Castagna, V. Mazzucchelli, G. Fizzotti, S. Cremascoli, C. Pistarini

50 **CLINICAL AND INSTRUMENTAL ANALYSIS OF A CASE OF SUSPECT IDIOPATHIC PISA SYNDROME**
O. Mercante, S. Fioretti, G. Ghetti, E. Maranesi, C. Gagliardi

53 **INTER-OPERATOR REPEATABILITY OF THE MANUAL ASSESSMENT OF CERVICAL ROM IN NEWBORN INFANTS WITH MYOGENIC TORTICOLLIS AND POSITIONAL PLAGIOCEPHALY. A CASE CONTROL STUDY**
M. Murgia, R. Basile, E. Bellina, M. Paoloni, M. Favaretti, B. Hodo, V. Santilli

56 **ASSESSMENT OF THE MODIFICATION OF SCOLIOTIC CURVES IN BENDING, PRONE AND EXTENTION POSTURES THROUGH SCOLIOMETER (84 CASES)**
S. Orzes, G. Dalla Corte, F. Lunghi, M. Ambrosone, P. Ranaudo, R.A. Sergi

60 **COGNITIVE FUNCTIONS AND PRESBYPHAGIA**
M. Megna, T. Carbonara, A. Dellomonaco, M. Scaramuzzi, A. Parente, V. Lavermicocca, M. Notarnicola, T. Chiarelli, P. Fiore

63 **SCREENING OF SPINAL DEFORMITIES IN THE PUBLIC SCHOOLS OF FLORENCE ON 4361 CHILDREN**
A. Petrocelli, E. Pratelli, V. Petrai, L. Apicella, M. Morris, T. Palermo, L. De Natale, P. Pasquetti

65 **EVALUATION SCALES AND MEASURES IN CANCER REHABILITATION**
M. Pinto, F. Gimigliano, G. Iolascon

67 **SJÖGREN-LARSSON SYNDROME: A CASE REPORT**
N. Pinto, F. Cymbron, S. Pimentel, A. I. Silva, M. J. Festas, F. Parada

69 **TRATTAMENTO INFILTRATIVO E RIABILITATIVO NELLA COXARTROSI: RISULTATI A LUNGO TERMINE**
M.F. Pisano, D. Scaturro, M.L. Deluca, A. Filippi, G. Leone, A. Sanfilippo, G. Letizia Mauro

72 **COMPARISON OF EFFICIENCY BETWEEN HIGH INTENSITY LASER THERAPY (HILT) AND INTERFERENTIAL CURRENT (IC) IN PATIENTS WITH KNEE OSTEOARTHRITIS**
N. Štiglić-Rogoznica, D. Stamenković, V. Grubišić-Karavanić E. Radović, M. Rogoznica, T. Schnurrer-Luke Vrbanić

75 **THE ELECTRONICALLY CONTROLLED DYNAMIC BACKREST TO CONTAIN CHILDREN WITH DYSTONIC CEREBRAL PALSY: AN INNOVATION IN THE SEATING SYSTEMS.**
A. Pisano, M. Sabbadini, G. Rosellini, F. Mattogno

77 **TRIGEMINAL NEURALGIA - CLINICAL SERIES**
R. Sales Marques, F. Monteiro, M. Costa, R. Lopes, J. Costa, E. Afonso

79 **NEUROREHABILITATION IN MULTIPLE SCLEROSIS**
R. Sales Marques, F. Monteiro, M. Costa, R. Lopes, J. Costa, E. Afonso

81 **L'IMPORTANZA DELLO SCREENING PRECOCE E DEL TRATTAMENTO PERSONALIZZATO: UNO STUDIO SULLA RELAZIONE TRA DEPRESSIONE, FATICA E DISTURBI COGNITIVI NELLA SCLEROSI MULTIPLA**
C. Stea, A. Giovagnoli G. Guarino, E. Fragiacomo

83 **EFFETTI DEL TRAINING DI BILANCIAMENTO POSTURALE CON PEDANA OSCILLANTE A PERNO CENTRALE IN BAMBINI CON DANNO ACQUISITO DEL SNC. STUDIO PRELIMINARE**
M. Stortini, A. Pasquale, P. Giannarelli, G. Rosellini, L. Lucibello, F. Mattogno, E. Castelli

86 **NORMOCALCEMIC PRIMARY HYPERPARATHYROIDISM IN REHABILITATION UNIT**
G. Taveggia, F. Vavassori, I. Ragusa

88 **POST-ACUTE INTENSIVE STROKE REHABILITATION: CLINICAL COMPLEXITY AND OUTCOME EVALUATION WITH PROCESS-OUTCOME MARKERS**
F. Ventura, A. Aiello, M. Cella

90 **ROBOT-ASSISTED PRACTICE OF GAIT AND STAIR CLIMBING IN NON-AMBULATORY STROKE PATIENTS**
A. Waldner, C. Tomelleri, S. Hesse

92 **FURLONG HIP ARTHROPLASTY: FUNCTIONAL 7-YEAR FOLLOW-UP**
A. Zambito, C. Dall'oca, E. La Marchina, D. Bianchini, L. Roncari, A. Berizzi, R. Aldegheri

95 **INFLUENCE OF A SHORT PREOPERATIVE EXERCISE PROGRAM ON PATIENT'S OUTCOME AND LENGTH OF STAY AFTER HIP ARTHROPLASTY. DO WE NEED A DIFFERENT ORGANIZATIONAL MODEL?**
A. Zancan, M. Lacqua, C. Villani, D. Sparpaglione, E. Morisani M. Scotti, B. Bigatti, G. Lorber, G. Bronzini, B. Crosignani, I. Springhetti

98 **APPLICATION OF ROBOTICS IN DAILY CLINICAL PRACTICE**
D. Zutter, M. Urban

POSTERS

99 **DEVELOPMENTAL WRITING DISORDERS: UNDERSTANDING TO REHABILITATE**
M. Bejor, S. de Vincenzi, E. De Bernardi, R.Togni, I.M.C. Baschenis, S. Battezzato, M. Chiappedi

101 **ANALYSIS OF OUR EXPERIENCE IN PATIENTS FROM THE IUC IN A COMA, VEGETATIVE STATE OR MINIMALLY CONSCIOUS STATE**
G. Franzone, V. Guglielmi, M. D'Amico, D. Ammaturo, F. Trisi, T. Di Blasio, D. Sabatini

102 **FUNCTIONAL UPPER LIMB IMPROVEMENT IN LONG-TERM SPASTIC HEMIPARESIS WITH MULTIDISCIPLINAR TREATMENT**
M. AVELLANET, M.P. ALMIRON, M.L. TUTTE, B. ZEBALLOS.

105 **SELECTIVE RISK FACTORS EVALUATION FOR THE DEVELOPMENT OF CEREBRAL PALSY IN PRETERM INFANTS IN SERBIA**
Z. Jelic, I. Petronic, N. Cerovac, D. Nikolic, J. Ljubic

107 **NEUROPSYCHOLOGICAL TREATMENT IN SEVERE CASE OF COGNITIVE IMPAIRMENT IN CEREBRAL HEMORRHAGE**
M. Scapin, R. Frigo, M. Bertan, E. Italia, M. Zerilli

108 **LE VIBRAZIONI MUSCOLARI SELETTIVE NEL TRATTAMENTO DELLE PATOLOGIE NEUROMUSCOLARI**
F. PAGELLA, G. CHIAPPANO, G. REGGIANI, D. DI BIASE, D. GIUFFRÈ, C.M. TRAVERSO, D. LAGORIO

110 **OPIOIDS IN THE FUNCTIONAL REHABILITATION AFTER KNEE REPLACEMENT: OUR EXPERIENCE WITH PROLONGED-RELEASE OXYCODONE/NALOXONE**
A. Pezzoli, M.C. Marazzi, D. Mazzoleni, A. Ponzoni, L. Smirni, D. Malgrati

112 **OBSERVATIONAL STUDY ON THE THERAPY WITH INTRA-ARTICULAR HYALURONIC ACID AND RHEABILITATION TREATMENT OF COXARTHROSIS**
F. Giannetto, G. Scavo, A. Casa

113 **TECNICHE MANIPOLATIVE ORIGINALI**
R. Gatto, M.L. Tenaglia, I. Parola

115 **LA PRATICA DI AMMINISTRATORE DI SOSTEGNO: ESPERIENZA DEL CENTRO DI RIABILITAZIONE TERRANUOVA**
D. Corsi, D. Anelli, S. Canova, C. Cioni, G. Del Cucina, E. Sarcone, A. Zito

118 **PLAGIOCEPHALY: MOST FREQUENT CLINICAL PICTURES (103 CASES); INDICATIONS FOR PREVENTION AND TREATMENT**
S. Orzes, A. Vergerio, E. Rasori, F. Centa, D. Arquilla, F. Rizzo, R.A. Sergi, E. Viva

124 **1 RIB: DYSFUNCTION WITH EXPIRATION LIMITATION (305 CASES). RELATION WITH THE "SHOULDER PAIN" (127 CASES)**
S. Orzes, M. Ambrosone, R.A. Sergi, P. Ranaudo

128 **VIRTUAL REALITY AS A COGNITIVE REHABILITATION FOR ATTENTION DEFICITS IN POST-ISCHEMIC STROKE**
M. Corsano, A. Serafini, E. Mancino, S. Ruvolo, F. Zulli, R. Lardani

130 **INFLUENCE OF HALLUX VALGUS MANAGEMENT ON QUALITY OF LIFE**
M. Leigheb, A. Baricich, F. Grassi

135 **EVALUATION OF PROBLEMS AND NEEDS OF SEVERE BRAIN INJURED PATIENTS' FAMILIES: A STUDY CARRIED OUT IN THE NORTH OF ITALY**
A. Quarenghi, G. Salvi, M.G. Inzaghi, L. Manzoni, L. Smirni, M. Simonini

137 **IL RUOLO DELLA CIMT NELLA RIABILITAZIONE DELLE CEREBRO LESIONI ACQUISITE**
A. Quarenghi, G. Salvi, M.G. Inzaghi, L. Manzoni, L. Smirni, M. Simonini.

139 **BMD OF SPINE IN PATIENTS WITH FEMORAL NECK FRACTURE**
S. Jandric, Ž. Jovičic, R. Sukalo, S. Mijalkovic, V. Radjevic

141 **REPETITIVE TRANSCRANIAL STIMULATION FOR SPASTICITY TREATMENT OF MULTIPLE SCLEROSIS PATIENTS. PRELIMINARY DATA**
S. Lión Vázquez, L. Rodríguez Sánchez, B. Rodríguez Acevedo, M. Collazo Diéguez, C. Diéguez Varela, S. José Ribeiro, Midaglia L, Fraga Bau A

143 **FACIOSCAPULOHUMERAL DYSTROPHY. A FOUR CASE REVIEW**
S. Lión Vázquez, L. Rodríguez Sánchez, E. Del Corral Amorena M.T. Jorge Mora, M. Vázquez Gómez, A. Lozano Obispo, A. Maneiro Maneiro

145 **EARLY POSTOPERATIVE REHABILITATION AFTER RADICAL CYSTECTOMY FOR INVASIVE BLADDER CARCINOMA**
Đurašić Lj, Radovanović T, Zarić N,Đorđević V, Basarić D, Rajević S, Grajić M

147 **VALUTAZIONE DI SCREENING DELL'OSTEOPOROSI IN UNA POPOLAZIONE DI PAZIENTI RICOVERATI IN RIABILITAZIONE INTENSIVA**
P. Giacchetti, A. Fie', F. D'Ambrosio, C. Gagliardi, O. Mercante

151 **MULTI-FACETED BENEFITS OF REHABILITATION IN ADULTS AFFECTED BY SEVERE HAEMOPHILIA: A CASE REPORT**
C. Brucato, A. Vetro, M. Di Gesù, F. Mantia, F. Arcuri, R. Mantia

154 **READING AND WRITING SKILLS IN CROSSED APHASIA: A SINGLE-CASE STUDY**
E. Ripamonti, S.Aggujaro,P.Colognesi, F. Molteni

156 **GRUPPI DI NEUROPSICOMOTRICITÀ DELL'ETÀ EVOLUTIVA IN CORSO DI RIABILITAZIONE INDIVIDUALE: UN'ESPERIENZA DI INTERVENTO INTEGRATO PRESSO LA U.I.L.D.M. SEZIONE LAZIALE**
V. Saraceni, L. Tranquillo, G. Cogliati Dezza

159 **CENTRE OF EXCELLENCE IN HEALTH PROMOTION AND REHABILITATION: AN INTERDISCIPLINARY CO-WORK IN BALNEOLOGY IN ESTONIA**
Übner, Monika, Pärnu College, University of Tartu, Pärnu, Estonia

161 **APHASIA AFTER ACUTE STROKE: INCIDENCE, CHARACTERISTICS AND THERAPY**
MC Lata Caneda, P Felpete López, R Martín Mourelle, R Meijide Failde[3]

163 **DISTRIBUTION OF RISK FACTORS AND GENDER IN PATIENTS THAT ARE REFERRED TO A REHABILITATION FACILITY IN SUBACUTE PHASE OF STROKE FROM SERBIA**
Marica Gavrilovic, Ljubica Konstantinovic, Sindi Mitrovic, Aleksandra Dragin, Aleksandra Jeremic, Biljana Stojanovic

165 **A 2-MONTH-OLD GIRL WITH BILATERAL PERISYLVIAN SYNDROME AND ARTHROGRYPOSIS MULTIPLEX**
M. Vázquez Guimaraens, S. Castiella Muruzábal, P. Felpete López A. M. Balado López, A. I. Arias Pardo, M. Alonso Bidegain.

166 **FUNCTIONAL OUTCOME OF INPATIENT REHABILITATION IN PERSONS WITH BRAIN TUMOURS**
S. Toste, A. Camelo

168 **EPIDEMIOLOGICAL PROFILE OF AMPUTEE IN REHABILITATION: A REPORT OF 86 CASES**
H. Migaou, M. Sghir, S. Boudokhane, H. Lajili, A. Jellad, Z. Ben Salah Frih

170 **MULTIMODAL ANALGESIA AND REHABILITATION PROTOCOL IN TOTAL KNEE REPLACEMENT: A PILOT STUDY**
A. Baricich, M. Invernizzi, P. Castelli, S.M. Rondini, M. Leigheb, C. Cisari

172 **LIMITI E MODALITÀ DEL CONSENSO INFORMATO PER LE METODICHE INVASIVE IN MEDICINA RIABILITATIVA ALLA LUCE DELL'ATTUALE LEGISLAZIONE**
D. Ferrucci, A. Corbisiero, D. Sicari, A. Forte, L. Di Lorenzo, C. Foti

175 **FUNCTIONING AND DISABILITY IN POST-MASTECTOMY PATIENTS**
R. Sales Marques, F. Monteiro, M. Costa, R. Lopes, J. Costa, J. Capela, E. Afonso

177 **THE REHABILITATION OF MEMORY DISTURBANCES IN ACQUIRED BRAIN LESIONS: ONE CASE REPORT**
C. CARPENEDO, P. LINDAVER, I. GUARRACINO, E. BIASUTTI

179 **FUNCTIONAL VALORATION OF BACK SCHOOL PROGRAM**
C. Varela Lage, M.P. Sánchez Tarifa, B. Palomino Aguado
L. Jiménez Cosmes, C. de Miguel Benadiba, J. García Echebarría.

181 **DISABILITY AND QUALITY OF LIFE ASSESMENT OF STROKE PATIENTS TREATED IN STROKE CARE UNIT**
MP Sánchez Tarifa, C Varela Lage, B Palomino Aguado
B Alonso Álvarez, J Acosta Batlle J, L. Jiménez Cosmes

183 **SPONTANEOUS OSTEONECROSIS OF THE KNEE (SONK)**
A.I Arias Pardo, M. Vázquez Guimaraens, J.R. Barrueco
Egido, A.M. Balado López, P. Felpete López

186 **EVALUATION OF EXTRACORPORAL SHOCK WAVE THERAPY (ESWT) IN THE TREATMENT OF CHRONIC EPICONDYLITIS**
A.M. Balado, M.J. Matos, C. Villarino, A.I. Arias, M. Vázquez, P. Felpete

188 **FRATTURE DA FRAGILITÀ OSTEOPOROTICHE ESTREMO PROSSIMALE DI FEMORE: STUDIO OSSERVAZIONALE IN UN REPARTO DI ORTOPEDIA E TRAUMATOLOGIA CON LA COLLABORAZIONE DELLA FISIATRIA**
R.F. Argirò, A. Mileto, V.R. Macrì, A. Demartino, B. Romano, F. Armocida

189 **CHRONIC BENIGN PAIN AND ASSOCIATED CONDITIONS IN ITALIAN BREAST CANCER SURVIVORS**
M. Pinto, F. Iazzetta FT, S. Piscopo FT, M. Piezzo,
S. Lubrino, G. Di Luca, R. Gimigliano

191 **POLIMORFISMO GENETICO ED OUTCOME RIABILITATIVO IN PAZIENTI OSPEDALIZZATI CON ICTUS ISCHEMICO: RUOLO DELL'APOLIPOPROTEINA E4**
T. Lombardi, F. Marrazzo, G. Vastola, N. Lioi, R. Santarsiero, P. Fiore

195 **CORRELATION BETWEEN COGNITIVE DISORDERS AND DYSPHAGIA**
A. Caiazzo, S. Cocci Grifoni, M. Capriotti, A. Giattini

197 **BILATERAL ANTERIOR INTEROSSEOUS NERVE SYNDROME FOLLOWING THE PROLONGED USE OF ELBOW CRUTCHES**
E. Recupero, M. Milazzo, M. Vecchio

ORAL PRESENTATIONS

Prevalenza e fattori predittivi di disabilità nella fase acuta post-chirurgia mammaria

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Il Carcinoma della mammella rappresenta il 27% circa dei tumori nella donna, attestandosi al primo posto tra le neoplasie che affliggono il sesso femminile nelle società occidentali. In Italia vengono effettuate più di 37.000 nuove diagnosi all'anno con differenze regionali che vedono una maggiore incidenza nelle regioni del Nord e del Centro Nord. L'età media alla diagnosi si è progressivamente ridotta negli anni, tanto che circa il 25% delle donne affette ha, attualmente, un'età inferiore ai 50 anni. Grazie al perfezionamento dei programmi di screening che permettono di effettuare una diagnosi precoce, all'evoluzione delle tecniche chirurgiche con approcci di tipo conservativo e alla disponibilità di nuove terapie farmacologiche, la sopravvivenza media si è allungata: a cinque anni dalla diagnosi la sopravvivenza è di circa l'85% e l'aspettativa media di vita dopo la diagnosi è di 17,5 anni. Pertanto, la gestione delle conseguenze e delle complicanze degli interventi medico-chirurgici rappresenta un aspetto assistenziale emergente di crescente peso sia per le pazienti che per gli operatori sanitari[1,2].

Nelle donne affette da Carcinoma mammario sono descritte molteplici complicanze post-chirurgiche, conseguenti sia alla menomazione strutturale resa necessaria dall'asportazione della neoplasia, sia alla compromissione funzionale emergente da un ridotto uso dell'arto superiore omolaterale all'intervento. Le complicanze possono insorgere in fase acuta, generalmente entro il primo mese, subacuta, entro i primi tre mesi e in fase cronica, dopo i primi 6-12 mesi, altre dipendono dalla ricostruzione della mammella, dopo mastectomia, con materiale autologo o mediante impianto di protesi[3]. Studi epidemiologici riportano come il dolore, le alterazioni del processo cicatriziale, gli esiti di lesioni di tronchi nervosi, il linfedema, la linfosclerosi e le limitazioni funzionali dell'arto superiore rappresentino le complicanze più frequenti in tutte le fasi.

La presa in carico riabilitativa può giocare un ruolo importante nel prevenire, limitare e trattare le complicanze post-chirurgiche a breve, medio e lungo termine, migliorando la qualità della vita della donna[1,2]. Molteplici approcci riabilitativi si sono dimostrati efficaci nel contrastare la compromissione funzionale dell'arto superiore e nel migliorare il benessere fisico; tra questi è apparso utile anche un intervento educativo a domicilio, basato sulla illustrazione di esercizi da svolgere in modalità autonoma, entro le prime quattro settimane dalla mastectomia[4].

Benché si ipotizzi un ruolo per la riabilitazione precoce nel prevenire e limitare l'insorgenza di dolore, limitazioni, linfedemi, gli studi primari sull'argomento sono scarsi.

Questa indagine prospettica si propone di valutare l'incidenza di complicanze post-chirurgiche a breve termine, in una coorte di donne affette da Carcinoma mammario, al fine di individuare alcuni possibili fattori predittivi e definire le opzioni terapeutiche più appropriate.

MATERIALI E METODI

L'indagine ha coinvolto 1209 donne sottoposte ad intervento chirurgico per patologia oncologica mammaria presso la Chirurgia Senologica degli Ospedali Riuniti di Ancona da Gennaio 2004 a Giugno 2012. Lo studio si è composto di due fasi:

a) una fase trasversale, condotta sull'intera popolazione, finalizzata alla raccolta di informazioni relative a variabili demografiche, alle caratteristiche del tumore, ai dettagli dell'intervento chirurgico e allo status funzionale a 24 ore dall'intervento (T1);

b) una fase longitudinale, realizzata su un campione di 124 pazienti, al fine di censire eventuali modifiche nell'escursione articolare (Range of Motion-ROM) della spalla, in elevazione, abduzione, extra- ed intra-rotazione, nella circonferenza del braccio e dell'avambraccio (misurate a 10 cm dall'olecrano), nel punteggio della Numerical Rating scale-NRS per il dolore. Sono stati inoltre ricercati deficit stenici e/o sensitivi emergenti e valutato il processo riparativo della ferita chirurgica.

Nell'arco di tempo tra T1 e T30, tutte le pazienti che hanno partecipato alla fase prospettica dello studio hanno eseguito autonomamente esercizi a domicilio, seguendo le indicazioni descritte in un opuscolo educativo.

RISULTATI

La raccolta dati eseguita sul campione di 1209 donne ha prodotto i seguenti risultati: l'età media delle pazienti studiate è pari a 56,2 ± 12 anni (range 28-87 anni). Il 70.5% delle donne ha subito una quadrantectomia, il 18,3% una mastectomia radicale, l'11,1 % una mastectomia non radicale. In media la mastectomia radicale è stata proposta a donne di età significativamente più avanzata (62 vs 55 anni) rispetto alla quadrantectomia. Nel 71,9% dei casi è stata eseguita una linfadenectomia totale e l'indicazione a questo intervento è diminuita significativamente nel corso degli anni (91% dei casi nel 2004-2005 vs 62 % casi nel 2011-2012). L'impianto di protesi è stato effettuato nel 21% dei casi ed in donne in media 7 anni più giovani rispetto alle altre (51 vs 58 anni). Nella maggior parte dei casi l'intervento chirurgico è stato condotto unilateralmente, senza differenza significativa di lato (dx 48.7%, sn 47.5%, bilaterale 3.8%). Nel 70% dei casi è stato posizionato un drenaggio in sede di intervento.

La valutazione funzionale condotta a 24 ore dall'intervento ha rilevato numerose complicanze: dolore alla spalla omolaterale (41%); ipo/anestesia (19.3%); limitazione del ROM della spalla in elevazione (56,8%), abduzione (60,5%), extra-intrarotazione (27%); incremento volumetrico dell'arto superiore (9,6%).

Lo studio prospettico ha coinvolto 124 donne (del campione iniziale di 1209) le cui caratteristiche demografiche, cliniche e funzionali sono apparse sovrapponibili a quelle della popolazione di provenienza. La valutazione a T30 ha rilevato la ricorrenza di dolore quale complicanza più frequente (62% dei casi), indipendente dalla presenza di dolore in acuto. La limitazione del ROM della spalla è risultata presente nel 39% dei casi, ed è apparsa significativamente correlata al posizionamento di drenaggio quale unico fattore predisponente (69% vs 33%, Chisquare 9,0; p-value: 0,002). Sono stati inoltre rilevati: disturbi della sensibilità (ipo-anestesia -50%- e disestesie/parestesie -14%), aderenze cicatriziali (32%), linfosclerosi (24%); quest'ultima è apparsa indipendente dall'età e dal tipo di intervento; in particolare non è stato confermato un ruolo predittivo indipendente dello svuotamento del cavo ascellare. Complicanze meno frequenti: cheloidi (11%), contratture muscolari (9%), linfedema (6%).

DISCUSSIONE

Concordemente con la letteratura, dalla nostra analisi emerge che l'età media di diagnosi di carcinoma mammario si è abbassata negli ultimi anni: la fascia di età maggiormente colpita nel 2004 era quella compresa tra i 60 e 70 anni, nell'ultimo anno quella tra i 40 e i 50 anni. Nel corso degli ultimi 5-6 anni si è inoltre assistito ad una riduzione degli interventi di svuotamento ascellare e di mastectomia radicale con incremento delle biopsie del linfonodo sentinella o di asportazione dei linfonodi di primo livello e di quadrantectomia. La modifica dell'orientamento delle scelte chirurgiche non ha peraltro limitato l'insorgenza di complicanze, che è rimasta attestata su percentuali superiori al 30%[5].

Tra le complicanze precoci più frequenti, questa indagine ha rilevato il dolore in sede di intervento e a carico dell'arto omolaterale, le disestesie a livello del cavo ascellare e dell'arto superiore omolaterale, la linfangite all'arto superiore omolaterale, nonché ematomi, sieromi e dermatosi purpurica.

La valutazione a un mese ha confermato il primo posto al dolore quale complicanza più frequente dopo l'intervento chirurgico, mentre il linfedema è apparso l'esito meno frequente.

Anche in letteratura, una revisione di studi scientifici evidenzia come, a distanza di tre anni dall'intervento, il 50% delle pazienti riporti almeno una complicanza, in larga maggioranza rappresentata dal dolore, mentre il linfedema ricorre sempre più raramente.

Nel ridimensionare la prevalenza del linfedema, la corretta educazione delle pazienti potrebbe aver giocato un ruolo decisivo: nel nostro campione, tutte le donne intervistate dichiaravano di aver seguito attentamente le raccomandazioni comprese in un opuscolo educativo, in cui si illustravano norme di igiene articolare e strategie di prevenzione del linfedema.

La limitazione funzionale della spalla, soprattutto nei movimenti di abduzione e elevazione è una frequente complicanza riportata già in altre casistiche[6]. Nel nostro studio, in prima giornata postoperatoria, più del 60% delle pazienti lamentavano una limitazione del ROM dell'arto superiore, in larga parte imputabile alla presenza della ferita chirurgica, dei punti di sutura e della medicazione. La limitazione funzionale della spalla persisteva o si ripresentava in quasi il 40% delle donne valutate ad un mese dall'intervento. La ricerca di fattori prognostici ha fatto emergere come il posizionamento di un drenaggio sia significativamente associato alla ricorrenza di limitazione funzionale della spalla omolaterale a 30 giorni dall'intervento, indipendentemente dall'invasività dello stesso e dallo svuotamento del cavo ascellare.

La linfosclerosi è stata osservata sia in seguito a dissezione del cavo ascellare che a biopsia del linfonodo sentinella con incidenza maggiore nel primo caso (44-72% contro il 20%) e nelle donne più giovani e magre[5]. Nel nostro campione la linfosclerosi a 30 giorni dall'intervento è stata osservata nel 24% delle pazienti, e la sua incidenza è apparsa indipendente dall'età, dal tipo di intervento e dalla linfadenectomia.

In letteratura viene descritta la ricorrenza di linfosclerosi e riduzione del range della mobilità articolare, anche a diversa distanza di tempo dal trattamento chirurgico[17], ed in generale il tipo di intervento (in termini di invasività e dimensione della linfadenectomia) viene considerato essere il principale fattore predittivo del numero e gravità delle complicanze[8].

Le discrepanze tra i risultati del nostro studio e i dati descritti in letteratura appaiono riconducibili a due gruppi di cause: in primo luogo, la nostra valutazione è stata eseguita in fase sub-acuta e la maggior parte dei dati pubblicati si riferisce a complicanze della fase cronica; in secondo luogo, gli approcci chirurgici hanno subito una trasformazione nel corso degli ultimi 5-6 anni, orientandosi globalmente verso modalità meno invasive, suscettibili, come tali, di realizzare un minore impatto sui meccanismi di drenaggio linfatico determinando una minore frequenza e gravità del linfedema e della linfosclerosi.

CONCLUSIONI

Le pazienti sottoposte ad intervento chirurgico per carcinoma della mammella sono soggette a numerose complicanze post-chirurgiche, che sembrano essere indipendenti dall'età e dal tipo di intervento. L'identificazione precoce delle alterazioni clinico-funzionali da parte di un team esperto può consentire di applicare un programma riabilitativo dedicato che favorisca il recupero e prevenga danni permanenti.

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Selective rehabilitative protocol related to graft choice for anterior cruciate ligament reconstruction

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There are various surgical procedures for ACL reconstruction and various rehabilitation protocols. A variety of grafts are available for use in ACL reconstruction surgery, including synthetic grafts. One of these, the Ligament Advanced Reinforcement System (LARS®), has recently gained popularity [1]. As both autograft tissue and synthetic devices are used for ACL reconstruction, it is clinically relevant to understand the biomechanical differences in knee function associated with each graft. The success of knee reconstruction surgery will therefore not only depend on the surgery, but also the rehabilitation program.

The overall purpose of this study was to examine the secondary planes of knee movement during the stance phase of walking in ACL reconstructed knees with the specific aims of evaluating the influence of graft type (hamstring, patellar tendon and LARS®) and control condition (separate control group), to investigate the functional outcome after ACL reconstruction evaluating biomechanical differences and variability associated with the use of autograft tissue and synthetic devices, in order to correct them by means of a selective physiotherapic protocol related to graft choice [2].

MATERIALS AND METHODS

Three groups were evaluated, each consisting of 8 participants. Eight male patients who underwent ligament reconstruction surgery with patellar tendon grafting (PT) (mean age, 27 ± 3 years; mean mass 81 ± 7 kg; mean height, 181 ± 4 cm), eight male ACL-reconstructed patients with an semitendinosus/gracilis tendon autograft (HS) (mean age, 29 ± 6 years; mean mass 79 ± 10 kg; mean height, 179 ± 5 cm), and eight male ACL-reconstructed with LARS® (mean age, 38 ± 5 years; mean mass 80 ± 6 kg; mean height, 180 ± 5 cm) volunteered to participate in the present study. The groups had undergone uncomplicated primary ACL reconstruction with either a central third bone patellar tendon bone autograft or a four strand (doubled semitendinosus/doubled gracilis) hamstring autograft or LARS®and met the following inclusion criteria: age 23 to 43 years, no previous cruciate ligament damage to either knee, time from injury to reconstruction between 3 weeks and 12 months, participation in Category I (involving jumping, hard pivoting, cutting) or II (involving running, twisting, turning) [3] sports on a weekly basis prior to injury, no collateral ligament injury, no chondral disruption greater than Noyes Grade IIA) [3], no meniscal pathology treated by repair and no other significant injuries or surgery to any lower extremity joint.

The control subjects were of comparable age and current type of sport activity to the patient groups, with no history of lower limb pathology.

Apart from the graft type and site of harvest, the surgical technique, including graft fixation, was identical in both groups. Proximal fixation was by means of an EndoButton attached to the graft with a doubled 3 mm polyester tape and an absorbable interference screw was used for tibial fixation.

These patients were assessed at the 1th and 3th month post-surgery. Gait analysis assessment considered kinematic and kinetic parameters obtained by the EL.I.Te. 3-D SMART optoelectronic system (BTS, Milan, Italy) integrated by a telemetric system (Pocket EMG, BTS, Milan, Italy) for the recording of muscular values (muscular potentials and intensity of muscular contraction through dynamic electromyography). Two dynamometric platforms, a Kistler (Kistler Instrumente, AG, Winterthur, Switzerland) and an Amti (Amti Instrument, Massachusets, U.S.A.) permitted the calculation of the joint reaction forces in three dimensions (vertical, fore-aft, lateral) and moments of force at each joint.

RESULTS

In the three groups average gait speed, step length, stride length and cadence were all reduced compared to healthy subjects (Table 1). At the terminal stance there is a reduction of knee flexion for PT patients, with a significant Standard Deviation of the Difference (SDD=10,7% and 12.5%) with the kinematic curve peaks of HS and LARS® patients (Fig. 1). Clear differences were observed in the knee kinetic profiles between the different groups. The PT and LARS® patients demonstrated a reduced external knee flexion moment at mid-stance with a significant Standard Deviation of the Difference (SDD=14,3% and 16,8%), with the kinetic curves peaks of HS and LARS® patients (Fig. 2), that showed a reduced external extension moment at terminal-stance. Especially in PT patients the ankle power showed a reduction of positive push-off (Fig. 3). During walking there was an decrease in the overall muscle activity of the rectus femoris. In PT patients the activation time of the rectus femoris did change significantly with values of 60% ± 14% (Fig. 4). There was also a trend towards increased muscle activity of the biceps femoris (Fig. 5).

DISCUSSION

A number of studies have reported on the knee joint kinematics during walking following ACL reconstruction [5, 6]. However, the majority of these have focused on movements in the sagittal plane. One factor which may contribute to the altered movement patterns

Table I.—*Mean values of spatial-temporal parameters*

	Operated side K-J ± DS	Operated side G-ST ± DS	Operated side LARS ± DS
Temporal parameters			
Duration of stance [msec]	1004 ± 107.1	1003 ± 103.2	1001 ± 102.2
Duration of swing [msec]	492 ± 53.7	471 ± 48.6	462 ± 46.7
Duration of stance [% step]	67 ± 2.5	68 ± 1.9	66 ± 1.7
Duration of swing [% step]	33 ± 2.4	32 ± 2.0	34 ± 2.3
Duration of step [msec]	1496 ± 37.2	1474 ± 36.1	1474 ± 36.1
Cadence [steps/min]	80 ± 3.9	78 ± 3.2	77 ± 3.0
Duration of double stance [msec]	202 ± 38.1	196 ± 34.2	191 ± 32.9
Duration of double stance [% step]	14 ± 2.8	13 ± 2.6	13 ± 2.4
Spatial parameters			
Length of anterior step [mm]	598.36 ± 81.3	585.29 ± 76.6	584.91 ± 75.9
Speed [m/sec]	0.72 ± 0.17	0.73 ± 0.14	0.74 ± 0.17
Speed of swing [m/sec]	1.98 ± 0.5	2.39 ± 0.4	2.41 ± 0.5
Step length [mm]	1014.74 ± 161.6	1025.64 ± 159.4	1027.48 ± 158.6
Step width [mm]	167.84 ± 25.1	166.39 ± 24.8	165.23 ± 23.9
Mean speed [m/sec]	0.72 ± 0.14	0.73 ± 0.12	0.74 ± 0.11

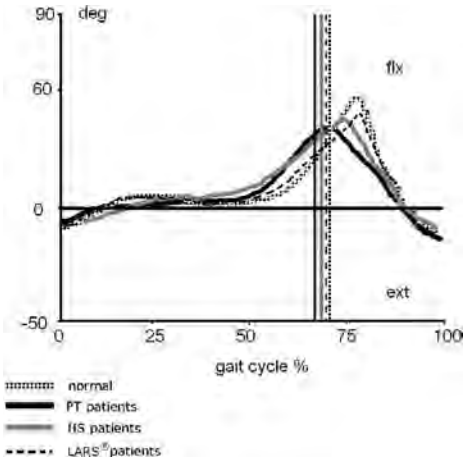


Figure 1

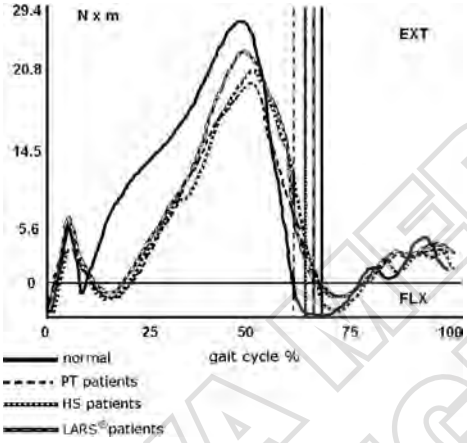
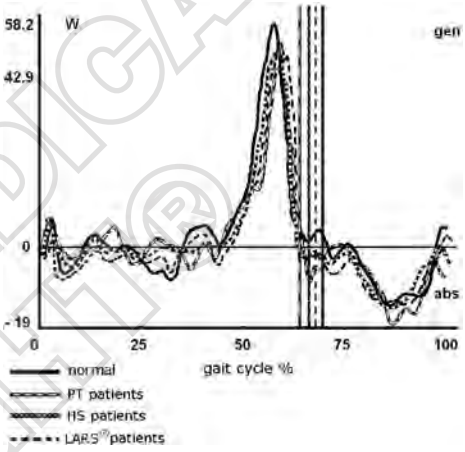


Figure 2



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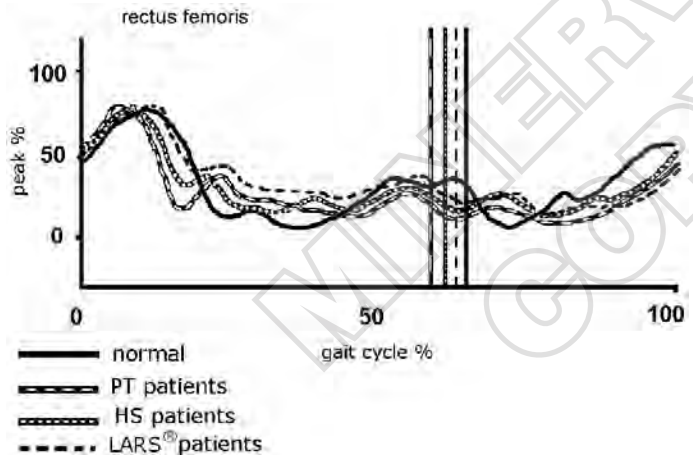

Figure 4

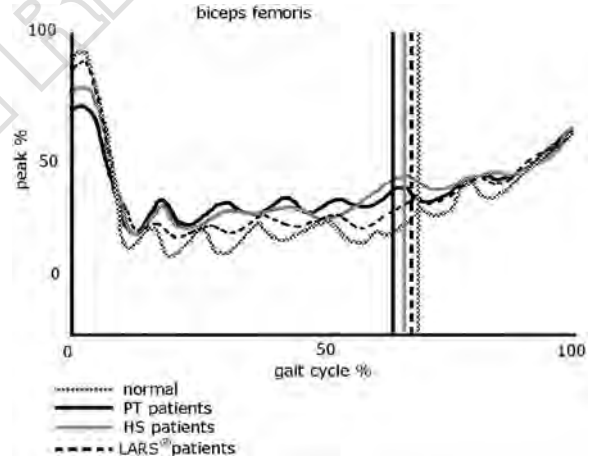

Figure 5

after ACL reconstruction is that most contemporary ACL reconstruction surgeries [11] have primarily focused on restoring anterior–posterior translation whereas the native ACL not only controls anterior–posterior translation but also internal–external rotation. In all but one of these previous gait studies the patient groups were mixed with respect to the type of graft used for the reconstruction procedure. In the sagittal plane, graft specific changes in knee kinematics and kinetics have been reported during level walking between hamstring and patellar tendon graft. There is some evidence that different surgical techniques, such as the placement of the femoral and tibial bone tunnels, affect gait kinetics. The coronal orientation of the ACL graft has been shown to affect sagittal plane knee kinetics during walking whereby a more vertical graft orientation has been associated with reduced peak external knee flexion moments [7]. However, patients with hamstring tendon grafts and LARS® and had significantly reduced varus at all time points during stance when compared to their patellar tendon counterparts.

CONCLUSIONS

Instrumental data from gait analysis demonstrate that are graft-specific differences in knee biomechanics after ACL reconstruction. The rehabilitation protocols should differ in relation to the

type of intervention and type of pro-ACL graft used. The most notable difference between the three patients groups was seen in the moments about the knee. The striking weakness of the quadriceps muscle in PT patients is attributed to the technique of harvesting the ipsilateral autologous bone-patellar tendon-bone graft [8]. The PT patients must avoid chain exercises open kinetics for strengthening muscles during the first 20 post-operative days, while produce an excessive stress on the neo-ligament. The open kinetic chain exercises incrementally augment patellar graft tension in direct proportion to greater angle of flexion. In HS and LARS® patients there are no clinically significant differences in the functional improvement resulting from the choice of the open-kinetic chain or closed-kinetic chain exercises in the early period after surgery.

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Stabilizzazione spinale con due biofeedback: un nuovo trattamento riabilitativo nella lombalgia

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Le lombalgie e le lombo sciatalgie sono nella gran parte dei casi dominabili nella fase acuta sia con i farmaci che con un intervento diretto come quello praticato nella moderna Medicina Manuale, qualora vi sia l'indicazione, che è attualmente basata sull' esame clinico descritto da R. Maigne (1), esame codificato che permette di individuare la sede di origine del dolore, e di trattare con manipolazioni vertebrali, e con infiltrazioni articolari e dei trigger point.

Un problema a parte sono i casi che diventano cronici, che rappresentano l'8-10% delle forme acute, unitamente ai casi di "Failed Back Surgery", pazienti questi in genere difficili da trattare con gli esercizi, che possono provocare il riacutizzarsi del dolore: nel trattamento riabilitativo di questi pazienti manca un razionale validato e condiviso di applicazione, supportato da attuali conoscenze di neurofisiologia che lo giustifichino.

In questi ultimi anni sono stati sviluppati da parte di studiosi dell'Università del Queensland (Brisbane, Australia) importanti studi clinici e sperimentali da cui sono emersi alcuni fondamentali concetti sulle caratteristiche e sulle funzioni dei muscoli paravertebrali e sul controllo neuromotorio, che hanno permesso di intraprendere una nuova via nel trattamento del dolore cronico di origine lombare.

Per comprendere la dinamica dell'articolazione intervertebrale è necessario riferirsi al modello descritto da Panjabi (2,3). Secondo questo Autore, la funzione e la stabilità dell'articolazione tra due vertebre è configurabile come un sistema, costituito da tre sottosistemi: il controllo neuromotorio, i muscoli, sottosistema attivo, e i legamenti, sottosistema passivo. Affinché l'articolazione sia stabile, i suoi movimenti devono avvenire per opera dei muscoli e soprattutto in base a un programma neuromotorio corretto, all'interno della contenzione assicurata dal terzo elemento, i legamenti, cioè entro dei limiti che Panjabi definisce "zona neutrale". Quando questa barriera viene superata, per traumi, ripetuti microtraumi, alterazioni strutturali delle vertebre, o semplicemente per una alterazione del comando neuromotorio, cioè dei pattern automatici che gestiscono i movimenti intervertebrali, può insorgere il dolore, e col persistere del disturbo, instaurarsi un cedimento delle strutture di contenimento e quindi una instabilità vertebrale. Il dolore, a sua volta, può determinare ulteriori alterazioni nel controllo neuromotorio e anche nella forza muscolare.

È noto che le funzioni fondamentali del rachide sono di mantenere la stazione eretta, di muoversi sotto l'azione della forza di gravità, e di proteggere il midollo spinale. Da qui la necessità di essere contemporaneamente rigido e flessibile. Queste funzioni sono svolte da due grandi sistemi muscolari: il sistema locale o profondo, che agisce in modo in gran parte automatico sulla base delle informazioni propriocettive e che, agendo a livello delle singole articolazioni intervertebrali, è il vero responsabile della stabilità del rachide; e il sistema globale, responsabile dei movimenti volontari, ma che da solo non può assicurare la stabilità, anzi può interferire e ostacolare l'azione stabilizzatrice del sistema locale, come non possono assicurarla le strutture osteo-legamentose.

Nel rachide lombare i muscoli intertrasversari e interspinosi del primo strato esplicano soprattutto un ruolo propriocettivo; i muscoli multi-segmentari, i veri stabilizzatori, sono il multifido lombare, il lunghissimo del dorso, parte lombare, l'ileolombare, il quadrato dei lombi, parte mediale.

Diversi studi elettromiografici hanno dimostrato che un ruolo fondamentale nella stabilizzazione del rachide è svolto dal muscolo trasverso dell'addome, che si può quindi considerare, con il multifido, il protagonista della stabilità lombare (4).

Nei pazienti con lombalgia sono state dimostrate alterazioni delle dimensioni e della composizione dei tessuti a carico del multifido, studiato con risonanza magnetica, nonché dell'attivazione muscolare e dell'affaticamento studiati con EMG e metodi meccanici (5). Anche il muscolo trasverso dell'addome mostra, nei pazienti con lombalgia, evidenti ritardi di attivazione, durante alcuni movimenti degli arti: sembra quindi che l'alterazione riguardi il controllo neuromotorio, piuttosto che la potenza o la resistenza del muscolo (6).

Numerosi studi hanno dimostrato che la disfunzione muscolare nella lombalgia è sopratutto un problema di controllo neuro-motorio dei muscoli profondi deputati alla stabilizzazione articolare segmentaria, in particolare il multifido e, tra gli addominali, il trasverso dell'addome (7,8).

Questa constatazione ha indotto questi Autori a ricercare nuovi modelli rieducativi che potessero esercitare questi due muscoli. Considerato che sia il trasverso, sia ancor di più il multifido, sono difficili da esercitare in modo selettivo, cioè senza coinvolgere altri muscoli, specie quelli del sistema globale, è stato necessario utilizzare, negli esercizi rieducativi, strumenti che consentissero una rapida presa di coscienza della loro contrazione, evitando in un primo tempo di coinvolgere i movimenti globali. Questi strumenti, che agiscono con meccanismo di biofeedback, sono l'elettromiografia di superficie (figura 1), utilizzata per rilevare e misurare il reclutamento delle unità motorie, che viene tradotto in un segnale visivo o acustico proporzionale ai valori rilevati, e lo "Stabilizer" (figura 2), biofeedback pressorio, consistente in un cuscinetto gonfiabile manualmente, dotato di un manometro, che, posto sotto l'addome o sotto la regione lombare, permette al paziente di osservare se durante gli esercizi vi siano modifiche dei valori pressori, causati da movimenti del rachide. Lo scopo di tutto ciò è di poter esercitare in modo isometrico il sistema muscolare locale e il trasverso, senza utilizzare il sistema globale, che deve essere, durante l'apprendimento, immobile e completamente rilasciato (9). Questo studio si propone di valutare preliminarmente l'efficacia di questo

Figura 1. — Elettromiografo di superficie per biofeedback.

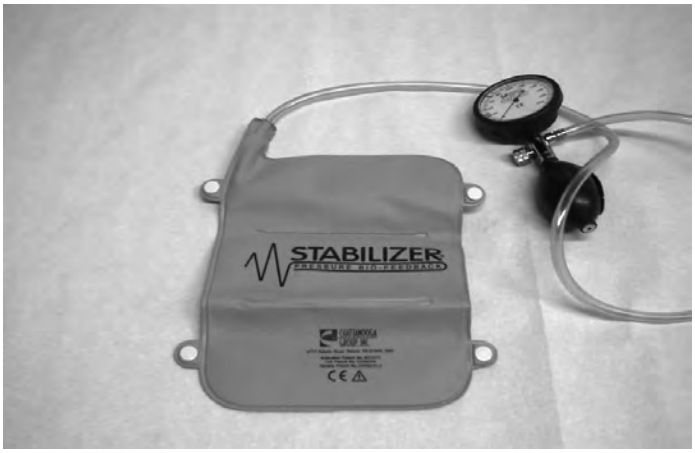

Figura 2. — Apparecchio "Stabilizer" per biofeedback pressorio.

trattamento, eseguito con esercizi isometrici del multifido e del trasverso dell'addome, insegnati mediante l'impiego degli strumenti suesposti, che consentono un feedback in tempo reale dell'attività muscolare, coscientizzandola, su pazienti affetti da lombalgia e lombo- sciatalgia cronica, della durata di almeno sei mesi, causata da discopatie, ernie discali, e artrosi somatica e articolare.

MATERIALI E METODI

Lo studio è stato condotto su 29 pazienti successivi, di cui 27 femmine e 2 maschi, di età compresa tra i 16 e i 79 anni, (media 26,3) e 2 maschi di età 20 e i 45 anni (media 32,5). Criteri di inclusione: lombalgia, con durata superiore ai sei mesi, causata da ernia del disco lombare, artrosi somatica e articolare, o semplicemente di natura disfunzionale (cosiddetto dolore non specifico). Criteri di esclusione: stenosi del canale lombare con caratteristica sintomatologia clinica, esiti di intervento per ernia discale lombare. Per la valutazione è stato utilizzato il Roland and Morris Disability Questionnaire, che comprende anche una scala analogica del dolore, Pain Rating Scale, somministrato prima e alla fine del trattamento. La valutazione del follow-up a 3 e 6 mesi è ancora in corso. Le sedute, della durata di circa 45 minuti, sono state effettuate individualmente, per un numero variabile da cinque a otto, 2 volte la settimana. Una volta istruito, il paziente doveva proseguire gli esercizi da solo; quindi sono stati consigliati esercizi per integrare le capacità acquisite con attività più complesse e con i gesti della vita quotidiana; nel frattempo il reclutamento dei muscoli profondi sarà divenuto automatico.

RISULTATI

La media degli score rilevati mediante il Disability Questionnaire è variata da 10,00,S.E.M.+-0.96 prima del trattamento, a 2,27+-0.34, dopo il trattamento (figura 3); quella del Pain Rating Scale da 2.75, S.E.M.+-0.18 prima a 0.62+-0,10 dopo (figura 4).

CONCLUSIONI

Questo studio è preliminare a uno studio randomizzato e controllato, e può considerarsi indicativo di una notevole efficacia ed efficienza di questo metodo riabilitativo, già alla fine dell'apprendimento. Gli esercizi isometrici del sistema locale richiedono che, durante lo svolgimento, i muscoli del sistema globale siano rilasciati e quindi il rachide sia immobile, quindi possono essere applicati

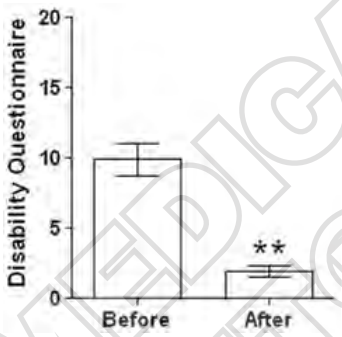

Figura 3. — Roland Morris Questionnaire: Disability. Valutazione degli score prima e dopo il trattamento (** = p <=001)

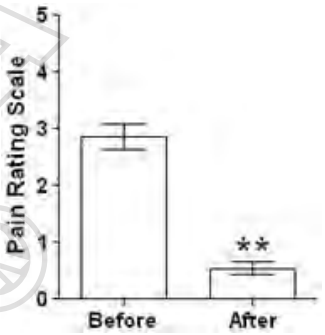

Figura 4. — Roland Morris Questionnaire: Pain Rating Scale. Valutazione degli score prima e dopo il trattamento (** = p <=001)

anche in caso di dolore grave, e precocemente nella rieducazione post-operatoria, nonché nei postumi di intervento chirurgico.

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Congenital muscular torticollis: a descriptive analysis

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Congenital muscular torticollis (CMT) is the third most common pediatric orthopaedic diagnosis in childhood[1], with the reported incidence being 0,3-1,9%[2]. The characteristic major clinical feature is the thickening and shortening of the sternocleidomastoid (SCM) muscle, which leads to head tilt and limited head rotation[3]. Skull asymmetry or plagiocephaly may occur. It can also be associated to other deformities, namely the developmental dysplasia of the hip (DDH)[4].

Although the true etiology remains uncertain, CMT is best viewed as a group of clinical presentations caused by various prenatal or perinatal etiologies, namely birth trauma, intrauterine malposition, ischemic hypothesis, the intrauterine or perinatal compartment syndrome theory and the hereditary hypothesis [3].

Ultrasonographic evaluation of CMT is the most widely employed method to obtain the primary diagnostic image[5].

Children with CMT can be assigned to one of three clinical subgroups: children with a palpable swelling or pseudotumor of the sternocleidomastoid, children with SCM thickness but no tumor and children with all the features of muscular torticollis without muscle thickness or tumor[6].

Early detection and initiation of physical therapy is related to improved outcomes. Through conservative treatment, >90% of the neonates reach full recovery without complications, but some groups do not reach full recovery. Surgical treatment has traditionally been performed for these groups[5,7].

MATERIALS AND METHODS

The subjects in this study were infants who were diagnosed with CMT in the Department of Physical Medicine and Rehabilitation of the Centro Hospitalar de Vila Nova de Gaia/Espinho, from December 2009 to December 2011.

We retrospectively reviewed the medical records of the 26 study participants and collected the clinical information for all the children, including the age at the first visit, the gender, the obstetric history, the gestational age, the method of child birth, the affected side, the clinical presence of tumor, thickness or plagiocephaly, the ultrasonographic findings and the coexistence of other deformities.

RESULTS

Twenty six children with CMT were included in this study. Out of 17 male (65,4%) and 9 female (34,6%), 5 patients were seen within 3 months of life, 12 were between 3 and 6 months, 7 between 6 and 12 months and 2 were older than 12 months at presentation (mean age: 6, 52 months). Four patients (15,4%) had a history of oligohydramnios and 5 (19,2%) were premature. Eight of the participants (30,8%) were delivered by Cesarean section and 18 (69,2%) through vaginal delivery.

The left-hand side was affected in 17 (65,4%) of the infants and the right-hand side in 9 (34,6%) of them. Plagiocephaly was identified in 21 of the participants (80,8%), a tumor was detected in 4 of them (15,4%) and an thickness was present in 2 (7,8%). Twenty of the patients (76,8%) didn't have palpable thickness or tumor. The ultrasonographic study was normal in 10 of the cases (38%), presented a difference in the thickness of the SCMs in 15 of the children (57,7%) and a tumor in 1 of them (3,8%). Among the 26 study participants 2 (7,8%) were noted to have developmental dysplasia of the hip, 2 had isolated renal ectasia and 1 had dorsal scoliosis. One of the children presented multiple associated deformities (dorsal scoliosis, multiple cervical spina bifida, plano-valgus feet and renal ectasia).

All the children were treated conservatively and all of them had a full recovery within less than a year of treatment.

DISCUSSION AND CONCLUSIONS

Considering the results of this study, there seems to be a male predominance with a relative ratio of approximately 2:1, slightly higher than described in the literature (3:2)[8].

Most of the children were diagnosed within the first 6 months of life.

The left-hand side was more commonly affected, as opposed to what was expected[9].

Plagiocephaly was present in most of the patients as expected (reported in 80-90% of children with CMT)[6].

Concurrent hip dysplasia was detected in 7,8% of the children with CMT, as is described in the literature (5-10%)[3].

Early detection and initiation of physical therapy is crucial to attain satisfactory outcomes[6].

Through conservative treatment, >90% of the children with CMT reach full recovery[6].

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L'indagine radiografica nei traumi lievi del rachide cervicale: revisione della letteratura e prospettive di valutazione in pronto soccorso

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Il numero di pazienti trattati ogni anno nei Pronto Soccorso italiani in seguito a traumi del rachide cervicale è alto; fortunatamente, le lesioni cervicali sono relativamente rare rispetto al numero di pazienti trattati per questo tipo di traumi. Nella quasi totalità dei casi, al paziente coinvolto in un incidente stradale e trattato in Pronto Soccorso viene effettuato un controllo radiografico per escludere la presenza di fratture o lussazioni: più del 95% dei pazienti sottoposti a tale controllo, in assenza di deficit neurologici, risulta negativo per tali lesioni[1]. Spesso, inoltre, nei casi dubbi, il controllo radiografico standard viene seguito da ulteriori esami, quali RX dinamiche o TC, incrementando in tal modo l'esposizione del paziente a radiazioni ionizzanti. In molti casi è dunque evidente che il primo controllo radiografico risulta privo di reale utilità diagnostica e contribuisce a creare fenomeni di affollamento di Pronto Soccorso e sale radiologiche, un'ipermedicalizzazione di problemi lievi, un'ingiustificata esposizione a radiazioni e un notevole aumento dei costi per il SSN.

Studi canadesi hanno proposto l'uso di scale decisionali cliniche, al fine di facilitare la valutazione dei pazienti in Pronto Soccorso e individuare quelli che hanno effettiva necessità di essere sottoposti ad un controllo radiografico; molte delle scale proposte però non vengono ancora utilizzate nella pratica clinica a causa della mancanza di studi sufficientemente ampi per dimostrarne la validità.

In Italia attualmente non vi sono linee guida sull'argomento, né sono disponibili metodiche di valutazione validate che possano aiutare la pratica clinica. Attraverso una revisione della letteratura, il nostro obiettivo è quello di valutare quali siano le indicazioni all'esecuzione di Rx del rachide cervicale dopo un evento traumatico, in assenza di linee guida validate sul tema.

MATERIALI E METODI

È stata svolta una revisione della letteratura tramite il motore di ricerca Pubmed con le seguenti parole chiave: cervical spine AND radiography; cervical spine trauma; cervical spine injury AND nexus; canadian C-spine Rule. Sono stati selezionati gli articoli pubblicati negli ultimi 10 anni e relativi a studi effettuati sugli esseri umani adulti.

RISULTATI

I dati epidemiologici mostrano che le lesioni del rachide cervicale colpiscono il sesso maschile più di quello femminile, e i soggetti giovani più di quelli anziani, benché sia dimostrato che il rischio di lesione del rachide cervicale è maggiore –e di più difficile individuazione- nel paziente anziano. La più frequente causa di trauma cervicale è senza dubbio rappresentata dagli incidenti stradali, essendo infatti presente in più dell'80% dei soggetti coinvolti in un incidente automobilistico[2].

La traumatologia distingue le lesioni del rachide cervicale in clinicamente importanti (frattura, dislocazione, instabilità legamentosa grave) o clinicamente non importanti (avulsione isolata di un osteofita; frattura isolata di un processo traverso che non coinvolge una faccetta articolare o frattura isolata di un processo spinoso che non coinvolge una lamina; frattura da compressione semplice che coinvolge meno del 25% dello spessore del corpo vertebrale, instabilità legamentosa lieve)[3]

Due scale sono state validate da ampi studi effettuati sulla popolazione: una derivante dal National Emergency X-Radiography Utilization Study Group [4] e un'altra dal Canadian C- Spine rule study[5]. La prima è stata validata con la pubblicazione di uno studio che comprende più di 34.000 pazienti e si basa su 5 criteri utili a dimostrare una bassa probabilità di lesione grave:

- non dolenzia sulla linea mediana posteriore;
- non deficit neurologici focali;
- normale livello di coscienza;
- non segni di intossicazione;
- non lesioni "distrattive".[6]

La sua sensibilità è risultata essere del 99%, mentre la specificità del 12.9 %. È stato dimostrato che lo stesso valore di sensibilità della scala viene confermato nella popolazione anziana, purché la compliance del paziente alla valutazione clinica sia conservata. La seconda scala valutativa, Canadian C-spine Rule, identifica in quali pazienti è necessaria l'esecuzione dell'Rx in base a una semplice flow chart che valuta:

- 3 parametri indicativi per alto rischio di lesione:
  - età avanzata;
  - meccanismo di lesione;
  - parestesie agli arti.
- 5 parametri che suggeriscono basso rischio di lesione:
  - trauma dovuto a semplice tamponamento
  - capacità di mantenere la posizione seduta
  - possibilità di deambulare
  - insorgenza ritardata del dolore al collo
  - assenza di segni clinici che suggeriscano traumi della linea mediana posteriore.

Viene valutata inoltre la possibilità di ruotare attivamente il collo a destra e sinistra per più di 45°[7].

Nel 2000 è stato pubblicato uno studio prospettico di coorte condotto tra il 1996 e il 1999 in 10 grandi ospedali canadesi di cui alcuni universitari: la valutazione delle diverse variabili da parte dei clinici precedeva l'esecuzione dei controlli radiografici; talora è stata possibile una valutazione indipendente da parte di medici differenti. In base a questo studio la Canadian C-spine Rule è risultata avere una sensibilità del 100% e una specificità del 42.5%. È tuttavia da considerare che alcuni pazienti non sono stati sottoposti all'esame radiografico successivamente alla valutazione, poiché in Canada –come in altri Stati esteri- l'esecuzione di tale metodica diagnostica viene d'abitudine evitata nei casi considerati privi di rischio per lesioni clinicamente rilevanti.

In conclusione, entrambe le scale di valutazione clinica prese in esame dimostrano ottimi livelli di sensibilità nell'individuare le lesioni rilevanti; uno studio eseguito comparando l'utilizzo delle due scale ha evidenziato una maggiore difficoltà di utilizzo e una minore accuratezza nell'applicazione della Canadian C-spine Rule da parte dei medici, con una conseguente diminuzione della sua potenziale efficacia. Nonostante questo si è anche visto che –se applicata correttamente- tale metodica di valutazione risulta superiore alla NEXUS.[8]

DISCUSSIONE

In Italia, l'utilizzo del controllo radiografico in pazienti trattati per traumi a livello cervicale varia a seconda del medico di turno in Pronto Soccorso, ma è abitudine frequente considerare l'esame radiografico standard come approccio di routine: sebbene si tratti di una metodica a basso costo se paragonata ad altre, il suo utilizzo anche quando non strettamente necessaria la rende causa diretta di un notevole incremento dei costi per il Sistema Sanitario Nazionale.

Vi è inoltre un'ulteriore considerazione da fare: in Italia è prassi comune per chi viene coinvolto in un incidente stradale richiedere un risarcimento assicurativo per il trauma fisico subito; spesso dunque il paziente è il primo a chiedere che venga eseguito l'esame radiografico, per poterlo utilizzare a scopi legali. Numerosi studi dimostrano che, in molti Paesi esteri, l'abolizione di tali forme di risarcimento economico ha coinciso con una netta diminuzione degli accessi in Pronto Soccorso e degli esami radiografici eseguiti in seguito a tamponamenti lievi[9].

Resta da sottolineare un punto focale raramente trattato nella letteratura esaminata, ovvero la posizione del Fisiatra rispetto all'esecuzione dell'esame radiografico: il referto radiologico è infatti presupposto imprescindibile per la pratica di alcune metodiche riabilitative. Il Fisiatra si troverà dunque a dover richiedere l'esecuzione dell'esame a tutti i pazienti da lui valutati, con un ulteriore aumento dei tempi di attesa per l'inizio del trattamento riabilitativo?

O sarà forse l'occasione per il Fisiatra di riappropriarsi di una maggiore autonomia decisionale, individuando la metodica diagnostica adatta ad ogni specifico paziente e selezionando i casi in cui il trattamento riabilitativo può essere intrapreso anche in assenza di un referto radiologico?

Oppure sarà necessario creare e validare degli specifici protocolli valutativi fisiatrici?

Si può comunque auspicare che l'utilizzo delle scale descritte permetta di selezionare quei casi in cui non solo la radiografia, ma anche il trattamento riabilitativo sarebbero superflui, lasciando così più spazio a chi ha realmente bisogno di tale cura.

CONCLUSIONI

Una migliore e più uniforme selezione dei controlli radiografici eseguiti all'accesso in Pronto Soccorso potrebbe standardizzare l'approccio medico ai traumi cervicali lievi, rendendolo più rapido ed efficace e limitando il sovraccarico delle sale radiologiche, pur evitando il rischio di incorrere in una sottovalutazione di lesioni clinicamente importanti. Limitando l'attuale frequente ipermedicalizzazione di patologie lievi e l'ancor più frequente medicalizzazione di aspettative risarcitorie, i tempi d'attesa e l'esposizione ingiustificata a radiazioni si ridurrebbero, con beneficio per i pazienti e vantaggi economici per il SSN.

Rimane aperto il problema della valutazione fisiatrica e del successivo trattamento riabilitativo, questione che necessita di ulteriori approfondite valutazioni, al fine di non vanificare i risultati ottenuti in Pronto Soccorso mediante l'utilizzo di queste scale, ma anche e soprattutto di non esporsi al rischio di incorrere in situazioni potenzialmente pericolose durante percorso riabilitativo.

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Treadmill antigravitazionale e pazienti anziani con frattura di femore: percorsi riabilitativi a confronto

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La frattura dell'estremo prossimale del femore è una delle più comuni conseguenze delle cadute in età senile. Ha un'incidenza particolarmente alta soprattutto dopo i 65 anni e nel sesso femminile. Il principale fattore di rischio è l'osteoporosi. Si stima che l' incidenza delle fratture dell'estremo superiore del femore potrebbe triplicarsi nei prossimi 50 anni a causa dell'aumentata aspettativa di vita della popolazione nei paesi sviluppati[1]. La frattura di femore ha un importante impatto sociale, assistenziale ed economico, rappresentando una delle più frequenti cause di ospedalizzazione, mortalità, disabilità e istituzionalizzazione. Da una analisi della letteratura è emerso che il tasso di sopravvivenza ad un anno è compreso tra il 64% e l'86%[2]. Il tasso di sopravvivenza e la mortalità standardizzata legati a questa patologia diminuiscono con l'aumentare dell'età del paziente. Secondo alcuni Autori, la mortalità legata a frattura di femore è assimilabile a quella causata da tumori maligni[3], inoltre, solo un terzo dei pazienti recupera una qualità di vita pari a quella precedente al trauma[4]. Il treadmill antigravitazionale è un sistema integrato formato da un computer, da un sistema di supporto del peso corporeo e da un tapis roulant. Utilizzare la differenza di pressione per il supporto del peso corporeo è un'idea che scaturisce dagli studi condotti dal dott. Robert Whalen, esperto di biomeccanica dell'esercizio nello spazio per gli astronauti della NASA. Si tratta di un sistema di supporto del peso corporeo attraverso un'elevata pressione dell'aria. All'interno della camera d'aria, nella quale si trovano gli arti inferiori del paziente, viene immessa aria, che crea una variazione di pressione differenziale rispetto all'ambiente esterno. Il gradiente pressorio che si istaura, crea una spinta che solleva il paziente in corrispondenza del suo centro di massa. Questa pressione si distribuisce uniformemente intorno agli arti inferiori, in modo da divenire pressoché impercettibile, regolando la variazione del peso corporeo percepito, fino ad una sottrazione dell'80%. La forza di supporto è proporzionale alla pressione di aria che può essere regolata in maniera rapida e altamente accurata, anche durante l'utilizzo dello strumento. Questo sistema non altera i normali pattern motori[5], inoltre, offre forze di supporto laterali e orizzontali quando il paziente perde l'equilibrio[6]. I picchi delle forze di reazione del terreno di una persona che corre al 50% del peso corporeo sono sostanzialmente simili alla camminata. Quest'ultimo punto è fondamentale per persone con mobilità ridotta, come gli individui che si stanno riabilitando, che in tal modo riducono il carico su muscoli e arti inferiori. Una pressione positiva, applicata sulla parte inferiore del corpo, aumenta la pressione sui tessuti, riduce la capacitanza vascolare e incrementa la pressione venosa centrale. In tal senso può servire come metodo terapeutico infatti, migliorando la circolazione, scoraggia la formazione di gonfiori e edemi.

Scopo dello studio clinico è stato valutare eventuali vantaggi in termini di durata del trattamento e del recupero neuromotorio dopo frattura prossimale del femore nel paziente anziano, mettendo a confronto due percorsi riabilitativi: uno che segue un protocollo standard e uno che si avvale di uno strumento innovativo: il treadmill antigravitazionale.

MATERIALI E METODI

È stato condotto uno studio clinico sperimentale comparativo randomizzato su una popolazione di pazienti anziani ricoverati presso il Polo Riabilitativo Don Carlo Gnocchi di Tricarico da febbraio 2012 a settembre 2012. I criteri di elegibilità nello studio sono stati l'età compresa tra gli 80 e i 90 anni, il tipo di frattura, la frattura della porzione prossimale del femore, il tipo di trattamento chirurgico, osteosintesi con chiodo endomidollare. Sono stati esclusi dallo studio pazienti con decadimento cognitivo, moderato-grave, e gravi patologie neoplastiche in atto. La popolazione oggetto di studio è stata di 20 pazienti, suddivisa in due gruppi da 10, un gruppo che ha eseguito un trattamento riabilitativo con l'ausilio del treadmill antigravitazionale (gruppo A) e un gruppo che ha eseguito il trattamento riabilitativo convenzionale (gruppo B). L'assegnazione ai due bracci di trattamento dello studio clinico è stata casuale. I pazienti assegnati al gruppo che ha eseguito il treadmill hanno osservato un protocollo (Tab. I).

La durata del trattamento con treadmill antigravitazionale è stata di 3 settimane con una frequenza di 3 sedute a settimana e incrementi progressivi nel tempo della velocità, della percentuale del peso corporeo percepito e della durata della seduta. Di ogni paziente è stata valutata la comorbilità, il dolore, il ROM articolare,

Tabella I.

	1° settimana	2° settimana	3° settimana
Peso corporeo	30%	50%	80%
Velocita'	0.8 km/h	1 km/h	1.2 km/h
Pendenza	0	0	0
Durata	20 min	25 min	30 min
Frequenza	3 sedute/settimana	3 sedute/settimana	3 sedute/settimana

la forza muscolare dell'arto operato, il grado di autonomia, il cammino all'inizio e al termine del trattamento. Per valutare il dolore è stata utilizzata la scala di valutazione NRS (numeral rating scale). L'escursione articolare è stata misurata, avvalendosi di un goniometro, come ROM attivo, cioè movimento eseguito e controllato solo dagli sforzi muscolari volontari dell'individuo, senza aiuto o assistenza di una forza esterna. La valutazione muscolare è stata eseguita per gruppi muscolari e si è assegnato un punteggio, alla forza del gruppo muscolare in esame, in base alla scala MRC. È stata esaminata la forza muscolare dei muscoli flessori dell'anca, dei muscoli abduttori e adduttori della coscia, del tibiale anteriore, del tricipite surale. Per stimare il grado di autonomia è stata somministrata la Modified Barthel Index. (7) L'analisi del cammino ha considerato la lunghezza del tragitto che il paziente è stato in grado di percorrere, il tempo che ha impiegato, il confronto tra la lunghezza del passo destro e di quello sinistro, la continuità del passo stesso e l'entità della deviazione nella marcia. I dati numerici raccolti sono stati analizzati calcolando i valori medi, la mediana delle diverse variabili in esame e sono stati confrontati tra loro con il test di Mann-Whitney.

RISULTATI

Dei 20 pazienti 4 sono maschi e 16 sono donne. Nel gruppo A, 6 pazienti hanno avuto frattura del femore dx, 4 del femore sn, nel B, 7 sono state le fratture del femore dx, 3 quelle del femore sn. Entrambi i gruppi sono risultati omogenei per comorbilità, nel gruppo A, 6 persone erano affette da ipertensione arteriosa, 2 da cardiopatia, 2 diabete mellito, viceversa nel gruppo B, 7 soffrivano di ipertensione arteriosa, 5 di cardiopatia, 2 di diabete mellito. All'ingresso l'80% dei pazienti di entrambi i gruppi avevano una punteggio NRS superiore a 4, considerato da diversi Autori punteggio oltre il quale è necessario impostare o rivalutare una eventuale terapia antalgica. Anche l'articolarità nei due gruppi era pressoché simile, il 70% dei pazienti aveva una flessione attiva di 30°, nel 30-40% dei pazienti l'abduzione attiva superava il 10° mentre l'80% dei pazienti aveva un'adduzione di 0°. La forza muscolare era maggiore di 3 solo nel 10% dei pazienti in entrambi i gruppi. I dati rilevati all'ingresso sono riportanti in tabella (Tabelle II e III). Il punteggio medio della Modified Barthel Index era pressoché sovrapponibile nei due gruppi, rispettivamente 36,4 nel gruppo A e 34 nel gruppo B. Tutti i pazienti arruolati nello studio all'inizio del trattamento necessitavano di doppio appoggio per deambulare (deambulatore con tavolo di appoggio) e alcuni, per maggiore sicurezza, di supervisione.

Il 50% di essi deambulava per 10 mt circa e presentava marcata deviazione. Il restante 50% deambulava per più di 20 mt circa e presentava lieve-moderata deviazione. Dalla rivalutazione finale, eseguita al termine del trattamento, è emerso un divario tra i due gruppi. Per quanto riguarda la sintomatologia algica, in entrambi i gruppi il 70% ha assegnato un numero inferiore a 4 al suo dolore. I dati riguardanti ROM e forza muscolare sono riportati in Tabelle IV e V. Il 50% dei pazienti nel gruppo A e solo il 10% nel gruppo B hanno raggiunto una flessione di 90; l'80% dei pazienti nel gruppo

Tabella II. — *Parametri all'ingresso gruppo treadmill.*

Gruppo A	G.M.	L.C.	A.M.	R.R.	M.R.	L.F.	M. B.	D.A.	S.A.	D.B.	media
Forzamuscolare	1-3	2-3	1-2	1-3	2-3	1-3	3-5	1-3	2-3	2-3	_
Flessione Anca	10°	30°	40°	10°	20°	30°	10°	10°	20°	10°	19°
Abduzione	20°	30°	30°	30°	35°	20°	20°	0	15°	10°	21°
Adduzione	0°	0°	0°	0°	0°	0°	0°	0°	10°	5°	1.5°
Barthel Score	39	43	29	30	46	41	46	27	37	26	36.4
Nrs Score	2	5	8	6	7	7	6	10	7	9	6.7

Tabella III. — *Parametri all'ingresso gruppo controllo.*

Gruppo B	A.B.	S.C.	L.A.	T.A.	D.A.	I.G.	C.M.	C.R.	B.R.	P.L	media
Forzamuscolare	1-3	1-3	1-2	1-2	2-3	2-5	2-3	1-2	3-4	1-2	_
Flessione Anca	30°	50°	10°	20°	10°	10°	20°	30°	20°	15°	21.5°
Abduzione	10°	10°	10°	20°	15°	20°	10°	20°	20°	30°	16.5°
Adduzione	0°	0°	5°	0°	0°	0°	0°	0°	0°	0°	0.5°
Barthel Score	32	36	24	33	26	32	41	26	63	27	34
Nrs Score	7	7	8	8	7	4	7	7	3	8	6.6

Tabella IV. — *Parametri all'uscita gruppo A (treadmill).*

Gruppo A	G.M.	L.C.	A.M.	R.R.	M.R.	L.F.	MB.	D.A.	S.A.	D.B.	media
Forzamuscolare	4-5	3-4	4-5	4-5	4-5	4-5	4	4	4	4	_
Flessione Anca	100°	110°	110°	90°	100°	90°	100°	80°	90°	90°	96°
Abduzione	40°	40°	40°	45°	40°	30°	40°	40°	40°	35°	39°
Adduzione	10°	5°	0°	10°	5°	5°	10°	5°	10°	10°	7°
Barthel Score	91	95	88	91	86	96	97	87	94	94	91.9
Nrs Score	0	4	0	4	2	2	1	5	0	1	1.9
DURATA Gg	40	44	49	30	37	21	25	43	25	31	34.5

Tabella V. — *Parametri all'uscita gruppo B (controllo).*

Gruppo B	A.B.	S.C.	L.A.	T.A.	D.A.	I.G.	C.M.	C.R.	B.R.	P.L	media
Forza muscolare	3-4	3-4	3-4	4	3-4	3-4	4	3-4	4	4	_
Flessione anca	80°	70°	90°	70°	70°	70°	90°	70°	70°	100°	78°
Abduzione	30°	30°	35°	45°	40°	40°	45°	40°	30°	40°	37.5°
Adduzione	5°	5°	30°	0°	10°	0°	20°	0°	0°	5°	7.5°
Barthel Score	69	88	78	86	65	81	81	81	96	91	81.6
Nrs Score	3	2	5	5	3	4	0	3	0	0	2.5
Durata	41	50	41	22	47	43	30	48	30	49	40.1

A, e il 60% nel gruppo B, hanno raggiunto un'abduzione superiore a 30°; tutti i pazienti hanno recuperato una discreta adduzione. Il 90% dei pazienti del gruppo A ha raggiunto una buona stenia muscolare con F>4, nel gruppo B solo il 40%. Alla dimissione solo il 20% dei pazienti del gruppo B ha riportato un Barthel score >90, viceversa nel gruppo A il 70% dei pazienti ha avuto un Barthel score superiore a 90.

DISCUSSIONE

I due gruppi di trattamento sono simili per comorbilità. Confrontando le valutazioni iniziali con quelle eseguite alla dimissione si può affermare che tutti pazienti hanno ottenuto un sostanziale miglioramento dai trattamenti. Esiste, infatti, una modificazione statisticamente significativa tra parametri iniziali e finali. All'ingresso i pazienti hanno un'importante sintomatologia algica (valore medio NRS nel gruppo A 6,7 contro 6,6 nel gruppo B), anche il ROM articolare iniziale è simile nei due gruppi, nel gruppo A il valore medio della flessione dell'anca è 19°, nel gruppo B 21.5°, così anche l'abduzione, rispettivamente 21° e 16.5° e l'adduzione 1,5° e 0,5°. In entrambi i gruppi la forza muscolare non supera il punteggio di 3 se non in un piccola percentuale di pazienti (10%). Anche per quanto riguarda la Barthel i punteggi medi nei due gruppi sono simili: 36,4 nel gruppo A e 34 nel gruppo B.

Alla dimissione si apre un divario tra i due gruppi che, per alcuni parametri, è molto marcato. I dati relativi alla sintomatologia algica indicano un punteggio medio di 1.9 nel gruppo A e uno di 2,5 nel gruppo B (p= 0,44381), anche se in entrambi i gruppi il 70% presenta una sintomatologia algica sostanzialmente ridotta rispetto all'ingresso. Nettamente a favore del gruppo A, sono i dati relativi all'articolarità, infatti, il 50% dei pazienti di questo gruppo ha raggiunto una flessione dell'anca superiore a 90° a differenza del 20% del gruppo B. **Il valore medio della flessione dell'anca nel gruppo A è 96°, nel gruppo B 78°. Tale differenza, a favore del gruppo A, è statisticamente significativa (mediana gruppo A= 80 [70-90], gruppo B=55 [50-70] p=0,01408).** Meno rilevante è la disparità del grado medio di abduzione (rispettivamente 39° e 37,5°) e dell'adduzione (7° e 7,5°). Notevole è la differenza per quanto riguarda la stenia muscolare, si registra un miglior risultato nel gruppo A, dove il 90% dei pazienti ha ottenuto una F>3 rispetto al 40% del gruppo B, tuttavia, questo dato non è ancora statisticamente significativo (p=0.3833). Nella deambulazione, non solo si registra un miglior risultato come endurance (metri percorsi), ma soprattutto vi è un netto miglioramento delle caratteristiche della marcia ovvero passo continuo, di uguale ampiezza e deviazione lieve o assente nel cammino. Il Barthel score medio nel gruppo A è 91,9, con il 70% dei punteggi >90, contro 81,6 nel gruppo B e solo il 20 % dei punteggi superiore a 90, non è emersa tuttavia una differenza statisticamente significativa (p= 0,07502) al test di Mann-Whitney. Per quanto riguarda la durata del ricovero si è registrata una diminuzione del 14% pari a 5-6 gg nel gruppo A.

CONCLUSIONI

I pazienti sottoposti a trattamento riabilitativo con protocollo treadmill non hanno presentato nessuna reazione avversa, non vi è stata sospensione del trattamento per nessun paziente e si è registrata una maggiore efficacia nel recupero neuromotorio (dell'articolarità, della stenia muscolare e delle caratteristiche del cammino), con riduzione dei tempi di trattamento. Si sottolinea un miglioramento della flessione dell'anca, statisticamente significativo, nel gruppo A. Questi apparenti vantaggi, osservati nel trattamento con treadmill antigravitazionale, sono da ascriversi a diversi fattori: la possibilità di regolare in maniera precisa il carico progressivo permette un training deambulatorio e una stimolazione propiocettiva precoce ed efficace con risultati migliori in termini di articolarità, stenia e qualità della marcia. Non vanno trascurati, in tal senso, altri fattori come: l'effetto antiedemigeno dello strumento, con ricaduta positiva nel controllo della sintomatologia algica, un miglior controllo dell'ansia da caduta e dell'autolimitazione che il paziente si autoimpone, grazie alle caratteristiche del sistema che offre forze di supporto laterali ed orizzontali, che impediscono la perdita dell'equilibrio. In ultima analisi, per quanto sia stato trattato un numero esiguo di pazienti, i dati desunti ci suggeriscono che il trattamento precoce con treadmill antigravitazionale migliorerebbe le performance motorie, l'endurance, dando risultati riabilitativi migliori e in tempi più brevi. È necessario un approfondimento di questi risultati, che verrà eseguito aumentando il numero della popolazione oggetto di studio e, soprattutto, facendo un follow up dei pazienti per i dati salienti.

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La valutazione posturale nelle pazienti con linfedema dell'arto superiore dopo intervento per neoplasia mammaria con svuotamento ascellare

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Il linfedema dell'arto superiore, causato dallo svuotamento dei linfonodi ascellari dopo intervento per neoplasia mammaria, può portare a conseguenze sia fisiche, sia psicologiche nelle pazienti che ne sono colpite. In questo studio è stato approfondito l'aspetto posturale, conseguente al linfedema analizzando i parametri posturali delle pazienti prima e dopo il trattamento riabilitativo, per mezzo di una piattaforma normalizzata informatizzata, con l'obiettivo di valutare gli eventuali effetti positivi del trattamento riabilitativo sulla postura.

MATERIALI E METODI

Sono state incluse nello studio 32 pazienti (età media 57,88 anni). Criteri di inclusione sono stati: presenza di linfedema a un arto superiore causato dalla dissezione ascellare, sesso femminile. Criteri di esclusione: patologie ortopediche, operazioni odontoiatriche in corso, affezioni vestibolari, malattie neurologiche, cefalea cronica, fatti infiammatori acuti (linfangite). Alle pazienti veniva richiesto di astenersi da altri trattamenti di terapia fisica.

Tutte le pazienti sono state sottoposte a visita fisiatrica, trattamento riabilitativo e a esame strumentale con una pedana stabilometrica statica a occhi aperti e a occhi chiusi, all'inizio e alla fine del trattamento. Per ogni paziente sono stati valutati il linfedema (accertamento clinico, stadiazione (1), misurazione centimetrica), la cicatrice chirurgica e la funzionalità dell'arto superiore. Il trattamento prevedeva l0 sedute di linfodrenaggio manuale (LDM), bendaggio, presso terapia, esercizi di respirazione, esercizi per l'arto superiore anche con bendaggio.

Sono stati valutati i seguenti parametri posturografici: le coordinate del centro di pressione (Cop), l'area, la velocità media e la lunghezza delle oscillazioni del Cop (2-4). Inoltre è stato preso in considerazione il peso del soggetto, in kg, prima e dopo il trattamento e la differenza delle circonferenze, in cm, tra le due braccia (delta).

I dati sono stati studiati usando il test statistico del t di Student accoppiato a 1 e 2 code.

RISULTATI

Dopo trattamento riabilitativo con linfodrenaggio manuale, bendaggio, presso terapia, esercizi di respirazione ed esercizi all'arto superiore, anche con bendaggio, i parametri valutati si sono modificati. C'è stata una riduzione statisticamente significativa del delta della circonferenza totale tra i due arti superiori (p= 0,0007); il peso dei soggetti si è ridotto dopo il trattamento (p= 0.034 con T test a 1 coda).

C'è stata una riduzione statisticamente significativa dei parametri stabilometrici considerati: dell'area di oscillazione del centro di pressione, della velocità media e della lunghezza delle oscillazioni sia a occhi aperti, sia ad occhi chiusi. Con p= 0,06 per l'area di oscillazione, p= 0,01 per la velocità media, p= 0,03 per la lunghezza delle oscillazioni nelle registrazioni a occhi chiusi.

DISCUSSIONE

Lo studio conferma che il trattamento riabilitativo del linfedema migliora l'asimmetria tra le due braccia, riducendo l'edema del braccio affetto (5,6).

Numerosi studi hanno già dimostrato che il trattamento riabilitativo ha effetto sui sintomi che incidono sulla qualità della vita quali dolore, senso di pesantezza, riduzione della forza, disturbo posturale associato all' asimmetria a livello del tronco, deficit muscolare a livello del cingolo scapolare, perdita di sensibilità nella sede chirurgica (7,8).

I risultati dello studio dimostrano che il trattamento del linfedema migliora il deficit posturale, spesso misconosciuto perché non associato a vertigini o sintomatologia specifica, ma solo a disturbi riferiti a livello di spalle e arto superiore (9).

Tale miglioramento potrebbe derivare dalla riduzione dell'edema presente nel braccio affetto, ma soprattutto sulla sintomatologia soggettiva di asimmetria verso il lato leso, percepita dalla paziente (10).

CONCLUSIONI

Si può ipotizzare che il trattamento riabilitativo, migliorando la differenza tra le due braccia, migliori la dispercezione corporea legata ad essa e quindi l'elaborazione delle afferenze propriocettive/sensoriali; ne risulta un miglioramento della precisione del sistema e del dispendio energetico necessario per il mantenimento della stazione eretta (11,12).

Questo è testimoniato dalla riduzione:

— della area di oscillazione del centro di pressione (indice della precisione del sistema posturale);

— della velocità media e della lunghezza del centro di pressione (indici stabilometrici indiretti di dispendio energetico).

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Which effects on spasticity after FES gait training in spinal cord injury persons?

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Spinal Cord Injury (SCI) is a devastating condition that affects several functions, including walking. In recent years technologies and advanced research improved rehabilitative and recovery outcomes, also in complete SCI lesions: exoskeletons, robotic devices, BWST training and virtual reality, Functional Electrical Stimulation (FES) and its appliances. All these rehabilitative techniques find support and approbation in Literature, but there are still many aspects to investigate.

FES was initially applied in the second half of 20th century and thanks to advances in electricity technologies, contemporary applications has been developed. In 1961 W.T. Liberson was the first to implement a prototype device for lower limb FES with the aim of restoring gait in hemiplegic patients. In 1973 a research group of Ljubljana finally proposed a FES device for the recovery of walking also in complete SCI patients.

Evidences of Literature about the benefits of FES gait in complete and incomplete Spinal Cord Injury persons are actually gaining clinical acceptance. We know that FES gait can enhance muscle strength and cardio-respiratory fitness in SCI. However, only few studies analyzed the effects of FES gait on spasticity in SCI individuals[1].

The aim of this study was to assess spasticity of the quadriceps and the hamstring muscles in SCI persons with instrumental data (isokinetic dynamometer) after a single session of walking training with functional electrical stimulation (timing 30 minutes) and more after a complete FES gait training (three months, three sessions for weeks).

MATERIALS AND METHODS

We studied a group of six males with complete thoracic level SCI. The average age was 33.2±4.7 years. All the subjects were in a chronic phase with a time from injury between 5 and 19 years.

The selective inclusion criteria were: a complete lesion (ASIA Impairment Scale A) and a score at the Ashworth scale between 1 and 3 (from a moderate to a marked muscle tone).

Every subject complete a FES walking programme realized in four steps: 1) Pattern Electrical Stimulation (PES) of the quadriceps and gluteus muscles, 3 sessions/week for 3 weeks; 2) FES cycling (quadriceps and gluteus muscles), 3 times/week for 3 weeks; 3) FES walking at BWSTT (TR Spacetrainer), 3 times/week for 3 weeks; 4) over-ground FES walking training, 3 times/week for 4 weeks.

Multijoint Isokinetic dynamometer Biodex System 4PRO® was used to test isometric contraction strength of quadriceps muscle under electrical stimulation.

The same dynamometer was also used to test stiffness before and after walking training.

To test muscle stiffness we registered the peak torque of the extensors and flexors muscles of the knee during a Continuous Passive Movement at two different speed 10 degrees for seconds and 120 degrees for seconds. We analyzed the mean value of at least four repetition for each speed and we expressed the value of stiffness as peak torque (Newton x meter).

The test was completed at the beginning and at the end of a single FES gait session and at the beginning and at the end of a FES gait training protocol (timing three months).

From a clinical point of view we evaluated stiffness using the Ashworth scale and we verified the muscles area of the thigh, calculated at the beginning and at the end of the training through the mean circumference and the anterior skinfold of the thigh of the subjects.

RESULTS

The clinical evaluation (Ashworth scale and thigh skinfold) didn't show significant variations after a single session FES gait and even after the complete programme.

The dynamometric data didn't reveal a significant variations of the peak torque at the continuous passive movement (stiffness) after the single sessions and after the FES gait training protocol, instead we verified a general trend to decrease peak torque (Fig. 1 - Stiffness at 10°/sec after a single session, Fig. 3 - Stiffness at 10°/sec after FES protocol). We analyzed the mean of peak torque of the quadriceps and we verified that during continuous passive movement at 120°/sec the peak torque decreased from 9.40 ± 16.15 Nm to 7.80 ± 2.21 Nm after the single session evaluations (Fig. 2 - Stiffness at 120°/sec after a single session), and from 9.12 ± 1.83 to 7.63 ± 1.89 Nm after the FES protocol (Fig. 4 - Stiffness at 120°/sec after FES protocol). We found an overall increase in strength of the quadriceps muscle after the FES protocol, to evidence the validity of the training (Fig. 5 - Peak torque of the quadriceps muscle under electrical stimulation).

DISCUSSION

FES benefits are highlighted in literature, in particular the effects on muscles strength. It is known that to optimize gait performance it is necessary to achieve adequate muscular strength of the lower limbs (especially gluteus and quadriceps) and increased

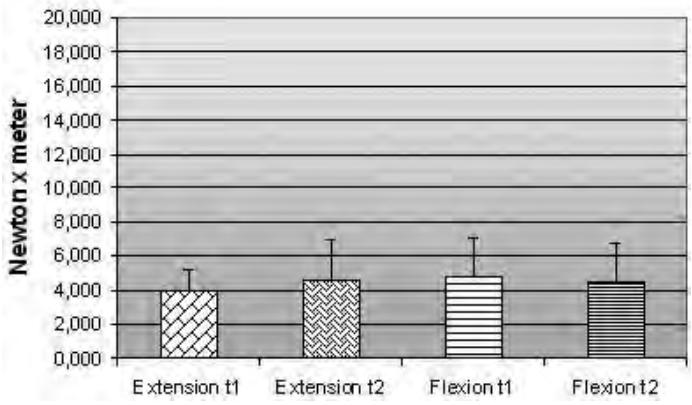

Figure 1.—Stiffness 10°/sec (single session).

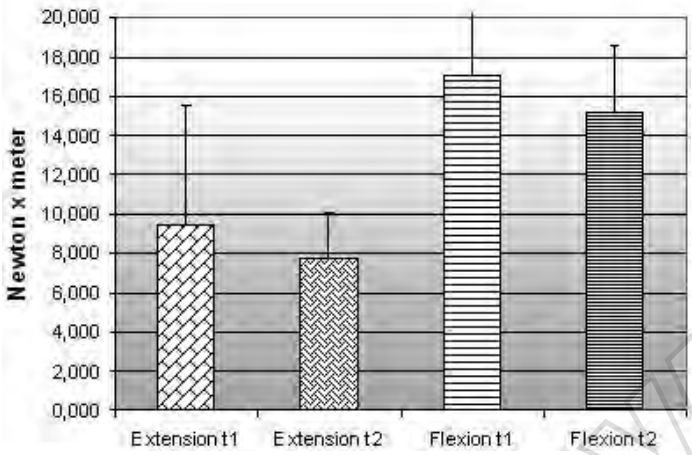

Figure 2.—Stiffness 120°/sec (single session).

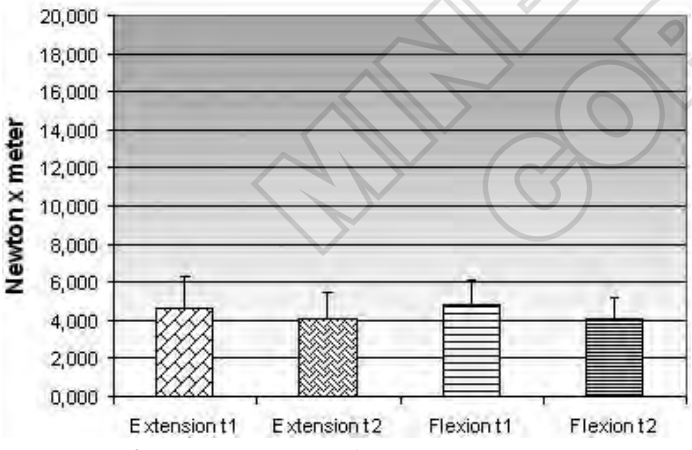

Figure 3.—Stiffness 10°/sec (FES protocol).

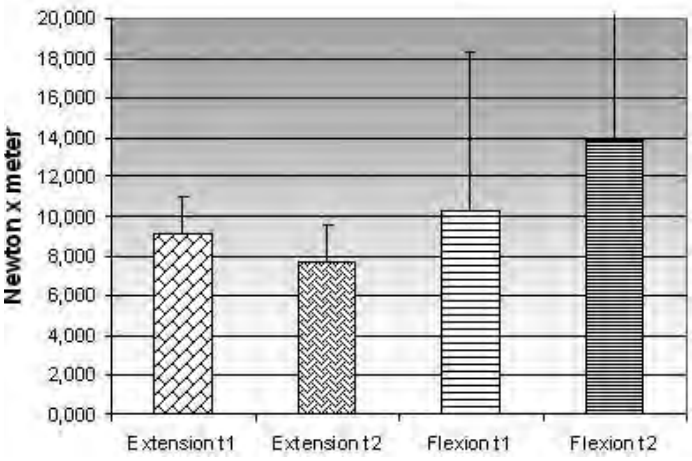

Figure 4.—Stiffness 120°/sec (FES protocol).

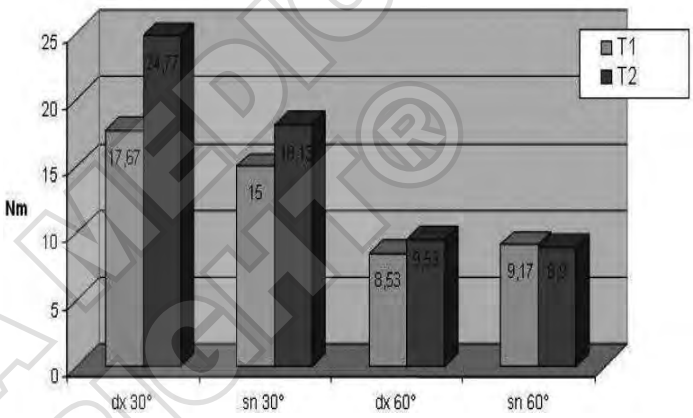

Figure 5.—Mean of Maximum Peak Strength

endurance. To increase the strength and the section of the quadriceps muscle we used PES in isometric modality, exercise that would provide the most significant improvements[2], followed by a period of FES cycling and BWSTT training, to heal also the increase of the endurance. Given the opposing views in the literature on the relationship between electrical stimulation and CNS spasticity, we choose to test stiffness using isokinetic dynamometer as its reliability in measuring spasticity in adult patients with spinal cord injury has been supported in the literature by several studies[3-5]. The differences between stiffness of the quadriceps muscles at the beginning and at the end of the training didn't show any statistical significance, but we observed a decreasing trend in several evaluations, and, more importantly, the absence of a significant increase of spasticity in the patients examined.

CONCLUSIONS

We believe that the effects of a functional electrical stimulation gait training are extremely important as they contribute to ensure a best performance of SCI persons. Further research is required to generalize our results to the widespread population of SCI individuals, in particular we need further evidence of the benefits of FES gait to prevent spasticity complications and pain.

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Musictherapy in aquatic environment and paediatric rehabilitation

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In this experimental research the Author underlines the effectiveness of the Paediatric Musictherapy Plan in Aquatic Environment (PaMtPAE) she has created and applied with reference to the psychomotor rehabilitation of paediatric patients suffering from different pathologies. The PaMtPAE can improve patient's motor coordination, cognitive, communicative and relational abilities, an experimentation of his own body image and a self-management of his expressive, emotional and creative resources.

MATERIALS

Eight patients (in two groups) that are aged 12 on the average (7-16) (six female patients and two male patients) suffering from mental retardation, sensorimotor and development disorders, Down syndrome, autism. Swimming pool (m. 8 x 4; depth: cm. 30-110; temperature: 33°). Eleven musictherapy sessions and a weekly session of 45 minutes for each group of four patients. The PaMtPAE is worked out by means of: - Patient's and his family sonorous-musical anamnesis by a questionnaire in order to take cognizance of the sonorous-musical esperiences, habits and likings of the patient (from his birth to the days before the trauma) and his family. - Production of Sonorous-Musical Energy (SME) by voice, water, body, floating sonorous-musical instruments and further instruments the Author has made from salvage and domestic articles (1). – Use of Edible Sonorous-Musical Instruments (ESMI): a roll empty of his crumb and stuffed with rice, or dough, and wrapped in tinfoil; tubular home made pasta (as flute) or stuffed with legumes (as rain-pipe); empty and stuffed egg with what the patient likes; empty capsicum of his seeds and stuffed with maize, or little pieces of parmesan, and then closed with sewing thread; empty pumpkin stuffed with croutons or pieces of candied oranges, or other foods; candied involucres of orange and mandarin stuffed with puffed rice; empty cream puff stuffed with pieces of chocolate, or peanuts, or almonds.- Four session observation protocols to analyse the features of each musictherapy sessions, the use of musical instruments and space and voice and silence and relation dynamics, the modulation of musical parameters (rhythm, timbre, intensity, duration, melody, harmony), the individual and group feedback (Somatic and Graphic Pattern: SOMPAT). - Patient-Environment-Music Index (PEMI) at the time t_0 and t_n and Therapeutic Advancement Index to analyse the evolution of the relation within the patient-environment-music-musictherapist system because of the musictherapy treatment.

In order to define with a logical and mathematical index the relation evolution of patient-environment-music system by the musictherapy treatment, the PEMI includes two Dimensional Categories (OME-M_LM_P): - 1) Social and Environmental Dimensional Category (OME), with three sub-units: Oneself (O); Man (M); Environment (E). – 2) Music Dimensional Category (M_LM_P), with two sub-units: Music listening (M_L); Music made by the musictherapist and/or the patient (Mp). Within each of the two sub-units of the Music Dimensional Category there are some subclasses that include several kinds of resonant instruments and various systems of sonorous communication. The whole environment includes some sub-units, as aquatic (A), domestic (H), urban (U), rural (L), natural (N), forest (F), and further environments (O). Therefore the Author sets up a Relation Evaluation Scale (RES), with five behaviour systems: Closing (C), Exploration (E), Expression (X), Interaction (Y), Integration (W), (CEXYW), that are valued in connection with the musical parameters of Intensity (J), Duration (D), Rhythm (R). The RES is planned with a scansion of the parameters from 0 to 100, and a gap of 20. The five behaviour systems are defined in this way:

1) Closing is a patient's behaviour addressed to himself, other people, environment, music, and musical instruments that are in the musictherapeutic setting;

2) Exploration shows a sensorial interest of the patient in the five elements (OME-M_LM_p) of the two Dimensional Categories;

3) There is the Expression when the patient shows an expressive attitude to other people and to the environment by means of the music made by himself too;

4) There is the Interaction if the patient accepts the bodily-sonorous-musical dialogue with the musictherapist and other people and the elements of the environment;

5) Integration is the evolutive aim of the musictherapist-patient system and the last stage of the musictherapeutic treatment too.

The five CEXYW systems are checked up within POS (t_0 time), by means of a cycle of music listening, with selected pieces having differences in these parameters: intensity, duration, rhythm, harmony, melody, timbre, genre, instruments, inside a setting provided with hi-fi and musical instruments. Therefore the Author sets up a grille to classify the five CEXYW systems.

The t_0 time defines the initial stage of the eco-musical system situation of the patient; at t_n time another matrix is made up. Therefore, at t_n time (where $t_n = t_0\ \delta t$) the Eco-Musical Therapeutical Matrix (EMTM) is made up to value the evolution of the patient behaviour system at t_n time. During the time interval $t_n - t_0 = Dt$ it's possible to calculate the variation of the musictherapeutical evolutions of the patient conditions at t_n time.

Moreover the Musictherapeutical Advancement Index (MAI) is determined:

$$MAI\ (t_n) = [PEMI\ (t_n) - PEMI\ (t_0)] / PEMI\ (t_0).$$

By a suitable algorhythm the CEXYW system and the JDR pa-

rameters can be put in correlation with the five elements (OME-M_LM_P) of the two Dimensional Categories.

After the observation and the analysis of the parameters and patient features, the Author arranges the suitable PaMtPAE for the patients setting up: - materials, - methods, - action times.

A musictherapist's intelligent flexibility is required to achieve the aim of the patient brain plasticity activation. There are numerous convergences between mind and music that are closely and mutually connected. Sound and music energy can promote a regressive sphere and an unexpected internal thought cohesion.

METHODS

The PaMtPAE sets up an active-creative Musictherapy session in several stages, as: - Welcome song. - Synchronization. The musictherapist's non-verbal communication meets the patient's bodily-sonorous-rhythmical activity (instrumental and vocal) through his instrumental/vocal production. The patient's motricity, the hearing acuity, more sensorial perceptions and the speech are involved. – Free bodily-rhythmical-sonorous games between the musictherapist and each of the patients and among the patients too. Later these games can have a structured task and/or can become a rhythmical-sonorous dialogue. - By means of the SME by the bodily-rhythmical-sonorous instruments each of the patients can tell his (true or fantastic) story and the role of the leader can change. Both the therapist and each of the patients can be the leader and can conduct the group orchestra, the group's composition of songs, drawing, movements and dances linked up with listening to recorded music by Hi-Fi or live music. - Within the SME production the Author/Musictherapist works out the differentiation of the sound pitch and of dynamic gradation and the improvement of patient's skills to catch the sound (near-far). - Rhythmic speech and singing drills using pacing and rhythmic patterns to address the disorders of the rate. - Vocal exercises focusing on the pitch to improve the intonation and on the diction to improve the articulation and to lead up it to an increased intelligibility. - Method of swelling or culmination method. By means of a gradual increase in the modulation of the musical parameters (time, velocity, dynamics, rhythm and meter, intensity, duration and sound pitch) and the vocalization the Author/Musictherapist makes the patients achieve an emotional swelling/culmination and then the slackening (2). – Final water-song (3).

RESULTS

In aquatic environment a free and empathic SME production can depict the individual/group mood and dynamics in order to achieve intrapersonal and interpersonal harmony. The ESMI significally interfere with the quality of the life and mood. The patient's motivation and the gratefulness in relation to the results of the ESMI manipulation become rehabilitation instrument. The SME is addressed to affective troubles treatment too and therefore gives rise to an emotional balance.

By the aquatic massage the SME can improve individual motor patterns, attention, concentration and sensorimotor coordination, bodily and spatial feeling and perception, extended borders of bodily contact, muscular/postural/mood tone, self-confidence, emotional communication, interaction and mutual acceptance and social relations. In this way the PaMtPAE can give rise to a self-improvement of patient's creative energy, that the ESMI and the SME extrapolate.

CONCLUSIONS

The Author points out the PaMtPAE optimizes the neuropsychophysical rehabilitation of paediatric patient's. The PaMtPAE promotes a better development of the sensorimotor/expressive/emotional/creative resources, a motivated compliance with the musictherapeutic care and a higher quality degree of the cognitive/manipulation/relation skills.

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Observations about a musictherapy treatment for a group of patients in vegetative state

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The Authors bring out the use of new algorithms in order to emphasize the therapeutical and rehabilitative influence of the Bodily-Environmental-Rhythmical-Sonorous-Vocal-Energy (BERSVE) within an Integrated Musictherapy Plan (IMP) in favour of patients in vegetative state (Vegetative State Rehabilitation Musictherapy Plan: VSRMP). This experimental research joins in some research works about the planning of the administration of the musictherapy by means of the IMP. The data of the studies about a group of three patients with serious brain injury are valued.

CLINICAL CASE N. 1

The patient is a woman aged sixty one that undergoes a surgical removal of the thyroid goitre in January. Four hours after the surgical treatment the cardiorespiratory arrest and the hypoxic-anoxic coma happen. The coma is GCS 4. In February the encephalon NMR shows a serious postanoxic pathology of the encephalon. Cranial nerves: deficit of VII. Nistagmo. Light muscular ipertone is more expressive on the level of the left upper limb where the osteo-sinewy reflexes (OTR) seem more vivacious. Always in February the cranial CAT shows a widespread ipodensity of the white substance. The spontaneous breath appears and the PEG is set. After a period of an intense psychomotor rehabilitation the patient is discharged and shows the following features: she has a sacral sore, she understands some simple orders and is responding to verbal stimuli by opening and closing eyes. Some attempts at phonation appear. The answer in decerebration by extension and intrarotation of the four limbs owing to the noxious stimulus is no more remarkable.

CLINICAL CASE N. 2

The patient, aged twenty four, is a polytraumatized man in December, admitted to a reanimation unit in coma with left hemiparesis and respiratory insufficiency. The break of his right thigh-bone and ulna undergoes the surgery treatment. Always in December the cranial CAT shows a cerebral edema, the increase of the extracerebral liquoral space in the bilateral frontal region and in the right temporal-insular region, the epicranial haematoma in the left parietal region. In January the encephalon NMR shows a cortex and grey undercortex nuclei damage owing to hypoxic and ischaemic event, a right frontal-temporal-parietal infarct lesion and other infarct lesions in borderland among left cerebral paths. There is a widespread assonal damage. The diagnosis proves left hemiparesis in a patient with multiple post-traumatic cerebral infarcts. Always in January the patient is admitted to the University Unit of Physical Medicine and Rehabilitation. The patient is vigilant, conscious, cooperative, with PEG, bladder catheter and compelled supine decubitus. The're a deficit of the seventh left cranial nerve and nistagmo too. Upper and lower limbs show left hemiparesis, spastic hypertone of flex muscles of fingers and left leg, small muscular strenght. Thorax X-ray: broken third rib on the left.

CLINICAL CASE N. 3

The patient is a man aged seventy nine in coma because of a vascular haemorrhagic pathology of the encephalon in August. After the cranial CAT he undergoes an urgent surgery treatment. Because of the noxious stimulus the upper limbs show a bland flexion; on the contrary the lower limbs don't show any motor answer. The value of the GCS is 7 and the patient shows an arterial hypertension (150/80). The patient opens the eyes but doesn't execute any simple orders. A week after the surgery treatment the value of the GCS is 9 and an initial reduction of the endoventricle haemorrhagic quota. In September the patient opens the eyes after verbal stimuli, offers a spontaneous breath and seems to understand what is said. Therefore he's admitted to University Unit of Physical Medicine and Rehabilitation. The patient shows finalized behavioural acts, shakes hands with the interlocutor, opens the eyes spontaneously and turns them to the doctor if he comes in the room. A persistent global aphasia is joined in a motor deficit. The PEG is set. In October the patient's vigilance gets better, the patient isn't feverish, seems to recognize present people and tries to communicate by some glances, gestures and verbal attempts. He tries to be sitting. Some generalized convulsive fits happen. Owing to the comitial fits the comatose frame reduces and the patient recovers the voluntary motility of the limbs, the vigilance and the skills of the verbal communication. Some receptive aphasic troubles persist. After a logopedic treatment in March the patient shows an improvement in the understanding.

MATERIALS AND METHODS

The IMP is articulated in six months with a musictherapy session three times a week according to the following methodological steps. - Sonorous-Musical Anamnesis of Patient and his Family and drawing up of the Musictherapy Assessment Document. – Three Patient Observation Sessions before the Musictherapy treatment in order to take cognizance of the neurovegetative and

psychophysical feedback of the patient during the BERSVE production and to settle the baseline. - BERSVE production by the musictherapist/patient system and through recorded classical music and modern songs and environmental and landscape sounds (Sonorous Environmental Energy) the patient listens to. Use of Conventional and Non Conventional Sonorous Musical Instruments (cSMI and ncSMI) and some SMI made by the first Author/musictherapist (1) with savage and some foods (Edible SMI: ESMI). Use of the musictherapist's voice and canto and of the voice of the patient's relatives and friends (Sonorous-Vocal Energy). - Four observation Protocols for each BERSVE production. – Evaluation of the patient's Somatic and Graphic Pattern (SOMPAT) in relation to his neuropsychophysical feedback. The SOMPAT is settled through the observation of patient's eye and mouth motility, muscular tone, possible perspiration, etc. (2). - Evaluation of patient's physiological parameters, before, during and after BERSVE production: Cardiac Frequency, Plasmatic Oxygen Saturation, Respiration Acts, Blood Pressure, Evoked Potentials, fNMR, SPECT, hormonal and immune body dosages. - Administration of Patient-Environment-Music-Index (PEMI) at time t^0 e t^n, in order to estimate patient's behaviour evolution and the Musictherapeutic Advancement Index. The test score is from 0 to 100, in order to set up the patient's Recovery Advancement Index.

RESULTS

The analysis of the results points out a range of behaviour acts monitored in connection with auditory and acoustic stimuli. These behaviours acts give evidence to the various patient's feedback closely connected with several sonorous-musical parameters and environmental sounds and voices of friends and relatives. The patient's feedback can be regarded as his shape of identification of the sonorous-musical parameters. That happens whether out of the differentiation of the musical pieces he listens to or the introduction of some interferences in relation to his friend's presence and the voices he listens to. In spite of the patient's variable feedback, a sensorial formula points out the patient is interested in listening to the songs of some living singer-composers he knew and listened to before the trauma but it gives rise to patient's adaptation and habit of listening to music too. This habituation can be broken off if different kinds of BERSVE, or stimuli, or troubles, as friends and their voices, or other perceptions, are given to the patient. The BERSVE production closely connected with patient's Psycho-Physical-Energy (PPE) can give rise to a Psycho-Physical Activation Feedback (PPAF) (3).

CONSIDERATIONS ABOUT THE NEUROENDOCRINE, IMMUNOLOGICAL AND VEGETATIVE FACTORS

This study intends to compare the outcome of the patients in vegetative state (VS) (clinical case n. 1 and n. 2) and in state of minimal consciousness (MCS) (clinical case n.3) and to carry out some clinical/functional assessments by means of the Disability Rating Scale and the Glasgow Coma Scale (GCS). The Authors point out the effectiveness of the neuroendocrine and immunobiological assessments (particularly the haematic assay of the osteopontin, OPN) and the imaging diagnostics too. The OPN is a pleiotropic glycoprotein, that remains in the bones and in various cellular types and in the macrophages too. This OPN is joined in the vascular injury and carries out some pro-adhesive and chemotactic functions and can stimulate the production of inflammation factors by the macrophagic cells. The histochemical studies and in situ hybridization prove the increase in the cortical OPN after severe brain lesions particularly with reference to a GDI positive subgroup of macrophages. This OPN increase averts the neurological injury in a significant way and promotes the migration/activation and the remodelling of the extracellular matrix of the encephalon. It's worth underlining higher haematic levels of OPN after fibrinolysis by tPA seem to be related to an unfavourable prognosis of the stroke (4); on the contrary the OPN that is administrated to the neuron culture through the intrathecal pathway proposes a neuroprotective role with reference to the patients with GCLA suffering from a severe destructuralization of the cerebral functions. Therefore the OPN carries out both proinflammatory and anti-inflammatory action in relation to the tissue injury and increases the neuron survival. The patients that are examined in this research underwent the haematic assay of the OPN (mean haematic value: 50 ng/ml in relation to the normal controls), the typing of the lymphocyte subset, the sero-assay of prolactin, cortisol, GH, ACTH, TSH, FT_3, FT_4, T_3, T_4. The clinical trials evidence brings out a bidirectional communication puts the nervous system in touch with the immunity system. The brain lesions produce some immunological modifications that are managed in part by the neuroendocrine mechanisms and in part by the neurovegetative efferent pathway joined in some organs namely the adrenal gland, the spleen, the bone marrow, the Peyer's patches. Finally the hormone assay of PRL, GH, cortisol, FT_3, ACTH, become a prognostic factor with reference to the consciousness disorders. For this study (still in progress) the Authors recruited the patients with GCLA that underwent the fNMR. The Authors point out the recorded messages of relative's voices and music listening promote the cortical activation of the temporal bilateral area in the VS. In the MCS clinical pictures the word and music listening supports the activation of the posterotemporal and temporo-insular areas. According to the stress theory by Selye (5) the Authors set up the connection of the organic factor that shows some biochemical, neuroendocrine and immunological functional elements with the functional neuroimages and the event-related evoked potentials of some association areas joined in the intentionality and the motor program processing namely the response to the sensorial stimuli that can be the words and the musical pieces. These motor programs can give rise not only to the activation that the fNMR shows but to the favourable responses in relation to the immunological and neuroendocrine-vegetative area in order to make superficial the consciousness states and promote the recovery.

CONCLUSIONS

The purpose of the study about these three patients is to give a new contribution to the development of programmatic lines of the IMP which is to be carried out by some monitored patient's cycles of feedback. By means of BERSVE and the knowledge of the patient's human environment and way of living the IMP is programmed and worked out by means of a spatial-temporal protocol in relation to the features of the patient and his environment. In relation to the consciousness troubles as the vegetative states, when there is a recovery of the vigilance the IMP can offer further therapeutical rehabilitation possibilities joined in peculiar connections. These ones can sensitize the residual neuronal systems by means of several stimuli the patient can perceive: therefore the stimuli give rise to patient's neurophysiological feedback. In spite of the widespread assonal damage the connections can go along under-cortex-cortical paths often by means of a neosynaptogenesis. So a new neurotransmission and a recovery of the conscience and the human relations arise. Particularly the three patients have showed a progressive psychomotor recovery and a resumption of communicative skills. It's worth pointing out the event of comitial crises in the third patient: these fits are likely to have caused a superfici-

ality of the coma and therefore a recovery joined in a fire of the reticular formation (this occurrence is the same as in relation to the generalized convulsive fits). In this way a neosynaptogenesis has been promoted with regards to the neurotransmitters too and then a reconstitution of the continuity/entireness of the neural network in order to guarantee some suitable relations of vigilance between the cortex and the peripheric structures and at the same time a right conduction of the afflux from the peripheric to central structures. In this context the IMP has been an additional value and has contributed to make active some preferential ducts in order to carry out the recovery and some motor behaviours that are managed critically by a suitable psychism. The IMP can contribute to increase the neural network the widespread assonal damage hasn't destroyed. In this way the activation of the minor hemisphere reorganizes in order to uphold the behavioural expressiveness such as the automatic motility and the prosody. The acknowledgement of these possibilities of recovery upholds the rehabilitative plan: in this way the IMP not only is joined in rehabilitative techniques but is an indispensable and necessary therapeutic treatment that requires to be emphasized. In fact the IMP can promote patient's improvement in the communication, relation and psychomotricity training.

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Correlation of urethral pressure profilometry with clinical measures of urinary incontinence severity and pelvic floor muscle performances in women with non neurogenic urinary incontinence

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Evaluating the severity of urinary incontinence (UI) is important in both research and clinical settings to adequately document baseline urinary leakage and the outcome after conservative or surgical intervention. In addition to urodynamic parameters, validated measures of incontinence severity include pad test and visual analogue scale (VAS). The primary objective of this study was to correlate measures of urethral pressure profilometry (UPP) to subjective variables of severity of urinary loss (e.g. VAS), pad test and pelvic floor muscle (PFM) performances in women with non neurogenic UI. The secondary objective was to find any possible correlation among demographic measures, clinical characteristics and PFM contraction performances.

MATERIALS AND METHODS

117 female patients without neurological disease complaining of UI were recruited into the study and were stratified in 3 groups: stress incontinence, urgency incontinence, and mixed incontinence. Women underwent a multichannel urodynamic evaluation, including static and dynamic urethral pressure profile (UPP): a) static UPP; b) pelvic floor muscle (PFM) contractions at maximum urethral closure pressure; c) UPP with 3 to 5 successive coughs (abdominal urethral transmission). Urethral testing was performed with bladder bladder filled at 250 mL with sterile water at room temperature, 6F triple lumen water perfusion catheter, and puller speed of 1 mm/s. Participants were then asked to conduct a 1 hour pad test (according to the International Continence Society protocol). The patients were then asked to grade the severity of their urinary loss using VAS from 0 to 10 (where a higher score indicates greater symptom severity). A clinical evaluation of PFM, including strength (grading from 0 to 3) and endurance, was performed too: a single maximum contraction, a sustained contraction, and some repeated contractions. Spearman correlation coefficients, ANOVA, Tukey's HSD and Kruskal-Wallis test were used for statistical analysis. Statistical significance was at $p < 0.05$.

RESULTS

The mean age of patients was 57.63 years (28-80). Urgency urinary incontinence (UUI) was reported in 14 (12%), stress urinary incontinence (SUI) in 62 (53%) and mixed urinary incontinence (MUI) in 41 (35%). The detrusor overactivity (DO) was recorded in 29 patients (25%). There was a significant correlation (ANOVA p=0.0281; Kruskal-Wallis p=0.038) between profilometry measures during voluntary sphincter contractions and pubo-coccygeous strength assessment. Maximum urethral closure pressure (MUCP) is negatively associated with pad test (Spearman correlation p=0.010) and positively with profilometry measures during PFM activation (Spearman correlation p=0.02). There were no significant correlations between other UPP measures (functional urethral length and transmission test) and PAD test, VAS or PFM performances. None of the urodynamic measurements was significantly correlated with VAS. VAS was clearly related with the type of incontinence (ANOVA p=0.019; Tukey's HSD p= 0.015; Kruskal-Wallis p=0.010) and was higher in women with mixed incontinence and tended to be lower in women with urge and stress incontinence. Other than a negative correlation between PFM strength and VAS (Kruskal-Wallis p=0.020; Spearman correlation p=0.005), there were no significant correlations between PFM contractions and baseline demographic or clinical characteristics.

DISCUSSION

Activation of the urethral rhabdosphincter and of the levator ani muscle is thought to contribute to SUI. It is generally assumed that women are able to voluntarily augment intra-urethral pressure by contracting those muscles, but there are not many data on whether this pressure increase is due to factors intrinsic or extrinsic to the urethra, e.g. compression of the urethra due to contraction of the levator ani. Schaer *et al.* (1), during evaluation of simultaneous perineal sonography and urethrocystometry, showed the association of urethral pressure variations and muscle activity. Urethral pressure variations are caused by the activity of urethral sphincter or PFM.

Erdmann *et al.* (2) observed that the degree of MUCP augmentation is positively associated with levator ani contraction strength and negatively with their avulsion, concluding that augmentation of MUCP is partly due to levator ani contraction.

Brincat *et al.* (3) evaluated primiparous women, 9-12 months postpartum: they found no significant association between MUCP or KUCP (Kegel Urethral Closure Pressure) in women with and without levator ani defects, no correlation between MUCP and vaginal closure force, and a weak correlation between KUCP and vaginal closure force.

Mayer *et al.* (4), in 163 female subjects with UI, found a moderate and significant correlation between profilometry measures of voluntary sphincter contractions and perivaginal EMG parameters as well as to the digital test parameters.

Morgan *et al.* (5), using magnetic resonance images, analyzed the relationship between urethral sphincter anatomy, urethral function and pelvic floor function: they found that a smaller striated urogenital sphincter was associated with stress incontinence and poorer PFM function.

This study demonstrated that the ability to perform an adequate PFM contraction is significantly correlated with profilometry measures of voluntary sphincter contractions and VAS, but is independent of subject age, parity, hormonal or hysterectomy status and other urethral profilometry measures.

No significant correlations could be found between other urethral profilometry parameters studied and PAD test, VAS or perineal performances apart a negative correlation between MUCP and PAD test. Similarly Theofrastus *et al.* (6) found that passive urethral pressure profile variables correlated significantly with incontinence episodes and pad use.

When the patients were stratified by type of incontinence (stress, urgency, mixed), VAS was a more accurate indicator of severity of incontinence than the urethral profilometry measures and the PFM digital test.

CONCLUSIONS

The presence of a significant correlation between the UPP parameters and PFM performances emphasizes the important sphincteric role played by the pubo-coccygeous muscle, and therefore its importance in the treatment of female UI. From a rehabilitation viewpoint, a good relationship between the pubo-coccygeous strength assessment and urodynamic testing is also an expression of the possibility of relying on these profilometric data to predict the therapeutic outcome.

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Secondary and tertiary prevention in the management of patients with stroke after discharge from intensive rehabilitation: scientific evidence and epidemiological statistical analysis of our experience

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L'ictus cerebrale è una tra le problematiche mediche più importanti. In base ai dati diffusi dalla Associazione ALICE (www.aliceitalia.org) e patologie cardiovascolari costituiscono la prima causa di morte nel mondo, circa 15 milioni di persone, e sono responsabili di un terzo della mortalità globale: l'ictus cerebrale rappresenta la principale causa d'invalidità.

L'ictus è una malattia non trasmissibile che colpisce ogni anno circa 15 milioni di persone in tutto il mondo, ogni 6 secondi una persona può essere colpita. Attualmente circa 5.7 milioni di persone muoiono per ictus ogni anno, se non si fa niente si prevede che il numero di persone che moriranno di ictus raggiungerà 6.7 milioni ogni anno dal 2015. In Europa si hanno circa 2400 nuovi casi ogni milione di abitanti. Le conseguenze sono disastrose: l'ictus provoca disabilità importanti, è la seconda causa mondiale di demenza e la terza causa di morte nei paesi industrializzati.

L'ICTUS CEREBRALE SI PUÒ PREVENIRE!

— nella fase asintomatica, cioè prima che si manifesti la malattia, (prevenzione primaria)

— quando ci sono stati i primi campanelli di allarme, cioè dopo il primo TIA (prevenzione secondaria)

— prevenire una recidiva quando si sia verificato il primo ictus (prevenzione terziaria).

— In tutte e tre le situazioni, le tappe fondamentali sono: controllo dei fattori di rischio, cambiamento delle abitudini alimentari e dello stile di vita e cure mediche quando non siano sufficienti gli interventi comportamentali. Vediamo ora quali siano i fattori di rischio.

CLASSIFICAZIONE FATTORI DI RISCHIO (FONTE: www.aliceitalia.org)

I fattori di rischio possono essere classificati in: a) non modificabili, b) modificabili e c) intermedi.

a) Non modificabili. Ad esempio:

— Età: la possibilità di avere un ictus raddoppia ogni decade di vita dopo 55 anni, sebbene l' ictus sia comune tra le persone più anziane, molte persone sotto i 65 anni possono essere colpite ed anche persone ancora più giovani.

— Ereditarietà e storia familiare: la probabilità di avere un ictus aumenta se un genitore, un nonno, una sorella od un fratello hanno avuto un ictus.

— Etnia: la popolazione di colore ha un maggior rischio di avere un ictus rispetto alla popolazione caucasica. Questo è dovuto al fatto che i neri hanno un alto rischio di ipertensione arteriosa, diabete, obesita;

— Sesso: l'ictus è piu comune negli uomini che nelle donne, ma più della metà dei decessi per ictus si verificano nelle donne. L'uso delle pillole contraccettive e la gravidanza contribuiscono a dare alle donne un rischio maggiore di sviluppare un ictus.

— Lo stress e l'ambiente in cui si vive.

b) Modificabili: quelli su cui può agire efficacemente una corretta prevenzione, cioè il **fumo**, la **dieta scorretta** e **l'assenza di moto**.

c) Fattori di rischio intermedi: prendono origine dal protrarsi nel tempo dei fattori di rischio modificabili, cioè le **cattive abitudini**, e sono **pertensione, diabete, obesità**, aumento dei **trigliceridi ed ipercolesterolemia.**

Inoltre ci sono i seguenti altri fattori:

d) Alcuni casi di ictus possono essere il sintomo di un disordine genetico come il "CADASIL", che è una encefalopatia causata dalla mutazione di un gene che porta al danno nella parte del vaso cerebrale, bloccando la circolazione del sangue. Molti individui affetti da CADASIL hanno una storia familiare di malattia, ogni bambino nato da genitori con la patologia ha il 50% delle possibilità di ereditare tale disordine.

e) TIA (Attacchi Ischemici Transitori) e attacchi cardiaci: Il rischio di avere un ictus per chi ha avuto un episodio precedente è molto maggiore rispetto a chi non ne ha mai avuto uno. Gli attacchi ischemici transitori (TIA) sono dei "campanelli d'allarme" che producono sintomi simili all'ictus ma non lasciano danni. I TIA sono fortemente predittori di ictus: una persona che ha avuto un TIA o pià eventi ha 10 volte in più la possibilità di avere un ictus rispetto a un'altra persona della stessa età e sesso che non lo ha avuto. Riconoscere e trattare un TIA riduce il rischio di avere un ictus, Per questo il TIA deve essere considerato un'emergenza medica e deve essere immediatamente valutato da una figura medica professionale.

f) Avere avuto un infarto cardiaco predispone ad un alto rischio di avere anche un ictus. Sia gli infarti cardiaci che l'ictus dividono molti fattori di rischio così come l'ipertensione, l'ipercolesterolemia, il diabete, il fumo, l'inattività fisica e l'obesità.

g) Ci sono altre patologie più rare che possono portare all'Ictus (per maggiori dettagli vai a rare cause di ictus.

La prevenzione primaria implica atteggiamenti mirati a ridurre i fattori di rischio quali ipertensione arteriosa, ipercolesterolemia, diabete mellito o cause quali la fibrillazione striale o stenosi arteriose asintomatiche. Comunque, ciò include decisioni educative, economiche e politiche quali ad esempio limitare il fumo nelle aree pubbliche, il consumo di alcool, e promuovere l'attività fisico-ginnica. *La prevenzione secondaria e terziaria*, invece, dopo un TIA o un ictus, consiste nel trattare dal punto di vista medico i fattori di rischio modificabili, specialmente ipertensione arteriosa ed ipercolestorolemia, iniziare una terapia antiaggregante e/ anticoagulante e valutare l'indicazione alla chirurgia vascolare dei grossi vasi arteriosi. Lipidi e colesterolo. A dispetto del chiaro ruolo delle iperlipidemie quali fattori di rischio per le cardiopatie, i dati epidemiologici in relazione allo stroke sono ancora controversi. Il recente trial SPARCL (Stroke Prevention by Aggressive Reduction in Cholesterol Levels) ha valutato I benefici di alte dosi di atorvastatina nella prevenzione secondaria dell'ictus in una coorte di pazienti ictati senza cardiopatie. Questo studio ha dimostrato una significativa riduzione di Ictus ricorrenti in tali pazienti. Nella nostra esperienza multisettng abbiamo seguito pazienti ricoverati principalmente per disabilità neurologica in affetti da Ictus Ischemico proveniente da Stroke Unit Regionali e/o pazienti con Ictus Emorragico provenienti dalla Neurochirurgia. o Studio La definizione di Stroke adottata dalla WHO è letteralmente "rapidly developing signs of focal (or global) disturbance of cerebral function, leading to death or lasting longer than 24 hours, with no apparent cause other than vascular" (Hatano, 1973). Ci sono 3 principali tipi di Ictus: ischemico, emorragico intraparenchimale ed emorragia subaracnoidea. (Warlow, 1998). Circa l'80% degli Ictus è ischemico.

LO STUDIO

In questo lavoro abbiamo criticamente e retrospettivamente rivalutato gli ultimi 160 casi ricoverati presso la nostra Riabilitazione Intensiva ospedaliera (degenza prima e poi Day Hospital riabilitativo), incrociato i dati con quelli grossolani dell'ultimo quinquennio relativi alle Consulenze dell' Unità di Valutazione del Bisogno Riabilitativo (UVBR presso Neurologia e Neurochirurgia) e poi dimessi per essere seguiti in DH o sul territorio dai servizi della ASL provinciale.

RISULTATI

L'analisi dei nostri dati, in sintonia con quelli epidemiologici di quasi tutto il mondo, cidice che l'Ictus ha rappresentato, per I pazienti della nostra Azienda, la terza causa di morte dopo il Cancro e L'infarto Miocardico Acuto. La percentuale di decesso per ictus entro il 28° giorno si è però drasticamente ridotta nell'ultimo ventennio in tutto il mondo. Nello specifico, essa è risultata essere significativamente più bassa nei maschi con età inferiore a 75 (rate ratio 0.91, 95%CI 0.85-0.98) e nelle donne di tutte le età (rate ratio 0.86, 95%CI 0.78-0.91). Dopo aggiustamento per età e sesso, la " case fatality rate" entro i 28 giorni dall'Ictus è risultata essere singificativamente più alta nei pazienti anziani rispetto ai giovani nel solo Ictus Ischemico. (OR 1.61, 95%CI 1.15 to 2.27) ma non nella differenza tra i due sessi (OR 1.37, 95%CI 0.90 to 2.09). I nostri dati preliminari sembrerebbero confermare i trends riportati in diversi studi anglosassoni in cui è riportato che il 24% dei pazienti aventi un TERZO ICTUS muoiono entro il mese. Di questi sopravvivono a sei mesi circa un terzo e sono tutti altamente disabili. (Warlow, 1998). Facendo un review della epidemiologia dei nostri ICTUS, oltre l'80% della disabilità severa è attribuita ad ICTUS a carico di pazienti ultra 65enni. I primi STROKE in assoluto rappresentano circa il 75% dei motivi di ricovero in Riabilitazione. Estrapolando i dati della riabilitazione ai dati grossolani riscontrati nei controlli Dipartimentali per gli eventi acuti, essi suggeriscono che su mille pazienti circa 12 hanno una disabilità molto severa e nuovi episodi entro il primo mese mentre 35 (3,5%) hanno un nuovo episodio entro l'anno. Di questi, una metà continuano la riabilitazione altri sono deceduti oppure aggravati in maniera significativa. Tra tutti i pazienti ictati seguiti nello scorso quinquennio il 68% ritorna nella propria casa entro l'anno. I reparti di codice 56 Riabilitazione Intensiva nella nostra Provincia hanno accolto su nostra segnalazione circa 976 pazienti ultrasettantenti post Stroke Acuto. Di questi 492 sono stati rintracciati telefonicamente e sono acora vivi ad almeno un anno dall'ictus. 436 non sono stati rintracciati per l'intervsta e non siamo in possesso di dati. Tra quelli rintracciati 383 (87%) vivono in casa ed 82 vivono da soli presso il proprio domicilio. 147 (38%) vivono in casa con badanti o assistiti dalla ASL in ADI e con badanti private. In circa l'80% degli intervistati la prevenzione era stata demandata alla iniziativa della famiglia e/o alle casuali richieste dei medici riabilitatori o da suggerimenti sporadici dei medici di famiglia. Non esiste purtroppo ad oggi una rete terziaria dell'ictus ove il paziente campano gestisca la disabilità facendo prevenzione secondaria e terzaria.

DISCUSSIONE

Nel corso del Congresso Nazionale "Stroke 2012" è stato rappresentato lo stato attuale dell'organizzazione per la cura dell'ictus in Italia. Facendo riferimento al numero di Stroke Unit (SU) previste in base alle indicazioni del Ministero della Salute (1 ogni 200.000 abitanti) è stato valutato il grado di copertura di detto fabbisogno nelle varie regioni. La Regione Campania appare in grave difficoltà/ carenza, con una copertura del fabbisogno pari al 6,8%, all'ultimo posto tra tutte le regioni. Alla luce di tali dati, abbiamo rivisitato la letteratura e le evidenze EBM ed abbiamo criticamente valutato i nostri protocolli medici e sociali (es. contattare e sensibilizzare il medico curante pre-dimissione) ed i nostri bias in itinere, al fine di ottimizzare i protocolli interni e condividerli con le diverse discipline coinvolte. L'incremento della vita media, il controllo dei fattori di rischio ed il miglioramento dell'assistenza sanitaria sembrerebbero aver modificato incidenza, prevalenza e mortalità dell'ictus cerebrale, in accordo alal letteratura (Feigine).L'ipertensione resta il principale fattore di rischio controllabile dell'ictus ed il suo trattamento è efficace nel ridurne l'insorgenza. Tuttavia il prolungamento della vita si accompagna ad un maggior rischio di ictus proprio per la sua maggiore incidenza nelle fasce di età più anziane. Inoltre, il miglioramento della assistenza sanitaria si è probabilmente accompagnato a ridotta mortalità da ictus cerebrale. A ciò si contrappone però l'incremento di ictus con grave compromissione funzionale residua tipica per definizione dell'età più avanzata. I nostri dati, esaminati da un collega epidemiologo specialista in Igiene ed esperto di statistica medica (F.D.) alla luce delle evidenze scientifiche, confermano che nonostante gli sforzi di tutti gli operatori ancora è viva la necessità di sensibilizzare in primis il personale medico-sanitario (necessità di condivisione delle diverse esperienze). *La prevalenza e la incidenza dei re-istus a 30-90 e 180 giorni rispettano in percentuali i dati riportai dalla ultima versione SPREAD che riportiamoin maniera graficamente esaustiva.*

CONCLUSIONI

Una recente pubblicazione dell'Istituto Superiore di Sanità IL QUADERNO e d il su citato SIMPOSIO hanno ampiamente descritto il fabbisogno legato alla problematica ICTUS CERE-

BRALE e fotografato lo stato attuale dell'organizzazione per la cura dell'ictus in Italia. Facendo riferimento al numero di Stroke Unit (SU) previste in base alle indicazioni del Ministero della Salute (1 ogni 200.000 abitanti) ogni Regione ha ampiamento valutato il grado di copertura di detto fabbisogno e si stà energicamente e diffusamente provvedendo ai dovuti adempimenti. La Regione Campania stà in questi giorni, con apposito Tavolo di Lavoro di esperti, giungendo ad una soluzione delle precedenti ed acncora attuali difficoltà/carenze per le quali si è ritrovata come già detto, con una copertura del fabbisogno pari al 6,8%, all'ultimo posto tra tutte le regioni in termini di Assistenza Riabilitativa, Stroke Unit e Rete Ictus. Riorganizzata la Rete Ictus Regionale Campana, sensibilizzate le istituzioni mediche, i colleghi ed i pazienti circa l'importanza di un corretto continuum terapeutico del paziente dimesso dall'ospedale ed aiutandolo a collocarsi negli appositi percorsi preventivi-terapeutici, è evidente ed auspicabileche si ottenga una riduzione del numero di re-ictus e di patologie vascolari correlate. Identificare e trattare i fattori di rischio secondari richiede ineludibilmente un adattamento ed un ottimizzazione dei servizi terziari e dei percorsi integrati ospedale-territorio.

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Dynamic anti-equinus orthosis (A.dyn.O.) in idiopathic toe-walkers

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Walking on toes might be caused by different neurological and developmental anomalies and could be the first sign of a global developing issue. In absence of definable causes, as referred by Enghelbert [1], walking on toes can affect 7-24% of the infantile population and relates in the same measure both sexes. This gait deviation can be defined Idiopathic Toe Walking (ITW).

ITW definition expects the possibility for the toddler to walk with a normal heel-toe footing if requested. Actually, just because it is defined as idiopathic, nowadays it represents a diagnostic, therapeutic and pathogenetic enigma.

Etiology has been attributed to congenital shortening of the Achilles tendon, to an abnormal length of the soleus, to unknown defects of the CNS, to a genetic dominant autosomal cause with variable penetrance, to a delay in the maturation of the corticospinal cord, to transitional stages of development, to vestibular dysfunction, viruses, to the influence of the baby walker in child development and to the living environment [2]. However, this is an anomaly of the step in the absence of signs of neurological, orthopaedic or psychiatric and, if it is present from the beginning of step to the third-fourth year of life, does not bother the doctor, being framed as a maturation of the walking pattern in developmental age. The persistence of the pattern over this age limit, results in the inclusion of the disorder in a condition known as pathological for the degenerative osteorticular consequences that arguably and variably from one individual to another, will emerge at a later age, adolescent and adult [3]. Frequently the Toe-Walking resolves spontaneously with growth without causing problems to the child; in other conditions, according to some authors [4], its persistence may lead to secondary alterations of the skeleton development, with variable invalidating deformities of the feet, restriction of passive movement of the ankle joint, reduction oh the hip flexion and also an increased risk of disc herniation.

Nowadays ITW treatment can be:

— rehabilitative: outpatient therapeutic exercise aimed at Achilles tendon stretching, physiotherapic re-education to improve kinematics and kinetics of gait;

— pharmacological: inoculum of botulinum toxin type A at the level of the plantar-flexors muscle groups in order to reduce the contracture structured in the habit to incorrect pattern and in order to facilitate active stretching manipulations induced by the therapist.

— orthopaedic:
  - use of solid ankle AFOs that constrain the ankle joint at 90 °, used during daytime for walking and night time for positioning;
  - use of serial casts for the equinus progressive reduction;
  - use of footwear and insoles;

— surgical: Achilles tendon functional surgery;

This work deals with the design and display of an original foot orthosis that, acting elastically in opposition to the ground reaction force expressed on the forefoot during stance phase, reduces and corrects the anomalous gate of these children. In this way, by increasing the stability of the foot during stance, increasing the length of stride and normalizing step frequency, consequently reduces the energy cost of walking with a minimally invasive treatment.

MATERIALS AND METHODS

The treatment was performed on 25 male and female subjects aged from 3 to 15 years: all those who passed the clinical, neurological and musculoskeletal exclusion criteria described in the literature, were monitored with baropodometric exams, video analysis of the gait and magneto-inertial systems for the analysis of the movement for a period that can vary from subject to subject ranging from seven months to a year, being still an experimental treatment under testing.

Lunge Test, modified according to the age of the subject and ankle joint angle measured with two arm goniometer, was privileged for the functional evidence of ankle joint R.O.M. reduction.

The subjects were treated with an innovative foot orthosis made up by three essential elements (Fig.1):

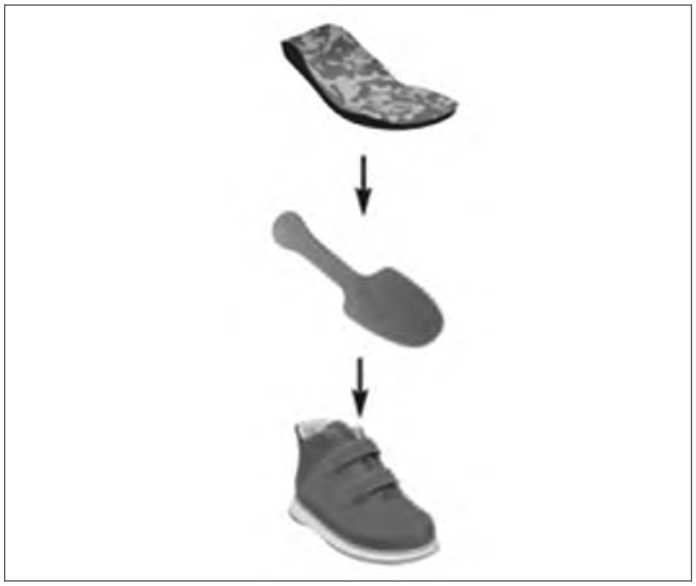

Figure 1.—Components of A.dyn.O.

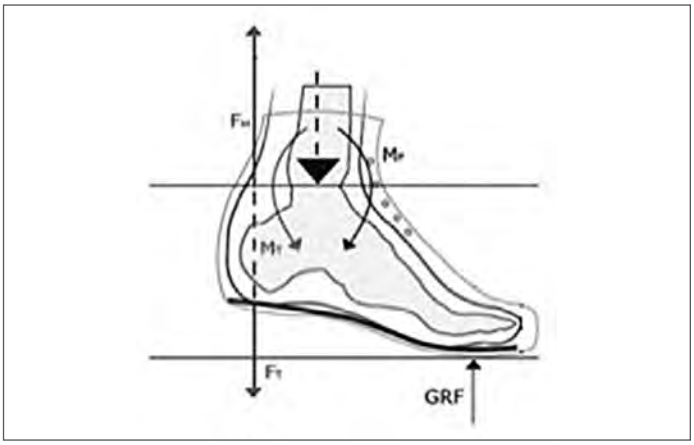

Figure 2—Forces and moments exerted by the plantar-flexors muscule groups (in gray) and by the orthosis (in black)

— soft insole with facultative enveloping limbs for the stabilization of the hindfoot in case of malalignment in the frontal and transverse plane and proprioceptive spots placed in the forefoot area;

— carbon fiber plate shaped like a spring and inserted fixed or movable below the insole or inside the shoe outsole, whose dynamic response, in terms of storage and release of elastic potential energy, can be calibrated according to demands;

— properly necked shoes with distal fastening placed in correspondence of the dorsal side of the joint line of the ankle, which is necessary to bring the orthosis coupled to the foot and distribute the ground reaction force developed by the plate throughout the hindfoot area.

Thanks to this configuration the orthosis acts as a spring capable of exerting, in front of a forefoot load (GRF), a biasing downwards force (FT) at the level of the hindfoot area leading to the expression of a dorsiflexion moment (MT) on the ankle joint that face the plantar flexion moment (MF) typical Toe Walker subjects (Fig. 2).

DISCUSSION

Toe walking can be caused by several neurologic and developmental abnormalities and may be the first sign of a global developmental problem. Treatment is based on age and the severity of the abnormality. Management includes observation, stretching, casting, bracing, chemo-denervation, and surgical lengthening of the gastrocnemius-soleus complex and/or Achilles tendon. An understanding of idiopathic toe walking as well as treatment options and their outcomes can help the physician individualize treatment to achieve optimal results.

Among the treatment options a choice is to do nothing, so do not take action, especially in situations where there is no evidence of neurological or orthopaedic disorders or ankle joint R.O.M. limitations waiting, for the child to leave this pattern during his growth.

On the other hand, there are clinicians who strongly believe, and we with them, that toe walking requires therapeutic interventions.

However, the analysis of the literature shows that the margin of relapse and recovery of toe-walking mode is considerable and that, with variable percentages, all the medium to long-term solutions could fail the goal of change the "habitual" pattern.

We think that this is largely due to non-utilization of the proper aid that, during the daily life activities, could leads the strike of the heel by a dorsiflexion of 5 ° or more. So, without the intention to judge any of the treatments described above as the best in comparison to others, we must intervene with a proper shoe that facilitates the contact of the heel to the ground.

RESULTS AND CONCLUSIONS

All patients provided with the described orthosis showed, after a few steps, the abandonment of the equinus pattern, adapting to a more physiological heel strike path.

The variables related to the time of appearance of the heel strike during terminal stance are in process to be quantified.

This variable seems strongly related to the degree of residual dorsi-flexion.

Moreover, the time spent in the correct support once abandoned shoes and the correlation of this with previous interventions (corrective plaster, botulinum toxin injection, stretching, surgery) are still in data collection phase.

The question about the specific criteria that leads to the usage of A.Dyn.O. remains opened: from clinical experience seems difficult to justify its use in adolescents with a reduction of the dorsiflexion excursion lower than 5 ° or even null, if not negative. In our opinion, these patients should be electively treated with botulinum toxin and subsequent serial casting or, more effectively, sent to the orthopeadic surgeon. In the subsequent period they may wear anti-equinus shoes.

Conversely little toe walkers aged 3 or more with a preserved dorsi-flexion should be immediately treated, ensuring clinical trials and periods of non-use until the abandonment of the negative pattern.

In conclusion we can say that so far the results are encouraging: discomfort or skin lesions due to orthosis are not reported and parents have returned after about six months for the renewal of the device after noting positive changes.

A long-term observation is necessary to define the therapeutic capacity of Anti-equinus dynamic orthosis.

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Revisione della letteratura sul trattamento cruento, conservativo e riabilitativo nelle lesioni del tendine d'Achille

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Il tendine d'Achille è il più frequentemente coinvolto in lesioni che causano una disabilità che perdura per circa 2 anni dall'evento traumatico acuto. L'incidenza ha una distribuzione bimodale con un picco tra i 30-40 anni ed uno tra i 60 e gli 80 anni. Sono affetti più frequentemente gli uomini che le donne e la maggior parte degli infortuni avviene nel corso di attività sportiva praticata in maniera occasionale (weekend warriors)[1]. Oltre all'evento traumatico acuto si devono considerare le patologie sistemiche che possono portare ad un indebolimento cronico del tendine d'Achille: patologie autoimmuni, arteriosclerosi, patologie dismetaboliche (ipertirodismo, iperuricemia, iperlipemia), anormalità strutturali del collagene e tutte le condizioni infiammatorie in generale[2]. I fattori che predispongono in maniera diretta alle lesioni sono invece i microtraumi ripetuti, la ridotta vascolarizzazione tendinea e le disfunzioni del ciclo del passo con i concomitanti possibili quadri di tendinosi e peritendinosi. La complessità delle patologie che spesso coesistono al momento della diagnosi di lesione acuta di rottura del tendine d'Achille e il suo importante ruolo funzionale hanno impedito finora l'identificazione di uno standardizzato approccio terapeutico e riabilitativo.

Obiettivo di questa revisione della letteratura è esplorare le più recenti tecniche utilizzate e identificare gli ultimi orientamenti terapeutici chirurgici, conservativi e riabilitativi.

MATERIALI E METODI

L'analisi della letteratura è stata condotta utilizzando le parole chiave; "Achilles tendon lesion" [Queries (therapy, broad)], "Achilles tendon injurye" [Queries (therapy, narrow)], "Achilles Tendon/Rehabilitation" [Majr], "Achilles Tendon/injuries" [Majr] AND "Achilles Tendon/surgery [Majr]. Da questa ricerca abbiamo selezionato 157 articoli. Abbiamo quindi inserito alcuni limiti: the last 5 years, English/Italian, human, adults 19+ yrs, ottenendo quindi 102 risultati utili. Di questi risultati 27 sono risultati essere di livello significativo.

RISULTATI

Trattamento chirurgico

Per quanto riguarda l'approccio chirurgico bisogna per prima cosa differenziare le tecniche a cielo aperto da quelle percutanee e mininvasive.

La prima tecnica a cielo aperto sviluppata è stata la termino-terminale con un'incisione di 6-8 cm lungo il margine mediale del tendine d'Achille con la caviglia in plantarflessione. La sutura può essere confezionata con la tecnica di Krackow o di Bunnell. Inoltre nel corso di interventi a cielo aperto è possibile rinforzare il tendine dopo la sutura utilizzando la fascia del muscolo gastrocnemio che può anche aiutare a prevenire le aderenze, oppure utilizzando un materiale sintetico com'è stato fatto nello studio di Fernandez-Fairen e Gimeno[3] o anche con il PRP (platelet rich plasma).

La prima tecnica percutanea è stata descritta da Ma e Griffith[4] nel 1977 con l'obiettivo di ridurre le complicanze legate alla ferita chirurgica e alla lesione del nervo surale. Le complicanze legate alla ferita chirurgica si ridussero ma non successe lo stesso con quelle legate al nervo surale. Quindi Assal *et al.*[5] nel 2002 hanno sviluppato uno strumento guida chiamato Achillon che dovrebbe evitare lesioni nervose iatrogene in quanto le suture sono eseguite attraverso questa guida.

Una review pubblicata dalla Cochrane nel 2008 ha concluso che il trattamento chirurgico rispetto a quello conservativo riduce in maniera significativa il rischio di recidiva ma è soggetto a molte altre complicanze come le infezioni. Le tecniche mininvasive potrebbero ridurre queste complicanze ma gli studi fatti su questo argomento hanno un basso numero di partecipanti e quindi potrebbero essere non completamente attendibili[6].

Trattamento conservativo

Il trattamento conservativo è stato tradizionalmente l'approccio riservato ai pazienti con importanti comorbidità, basse richieste funzionali e alti rischi chirurgici o anestesiologici. La complicanza più frequente per quanto riguarda il trattamento conservativo è la recidiva che si presenta nel 10-20% dei casi[7]. Uno studio[8] prospettico del 1993 condotto su 111 pazienti ha valutato l'outcome funzionale di pazienti trattati in maniera conservativa rispetto ad altri trattati in maniera chirurgica. La percentuale di pazienti che ha nuovamente praticato sport dopo la lesione al tendine d'Achille è significativamente inferiore nel gruppo di pazienti trattati in maniera conservativa; inoltre per quanto riguarda le complicanze nel gruppo di pazienti trattati in maniera conservativa si è osservato il 13% di recidiva contro il 4% osservato nei pazienti trattati chirurgicamente che però sono andati incontro a 2 casi di infezione profonda. Nel 2011 Wallace RGH *et al.* hanno condotto il più grande studio sul trattamento conservativo funzionale raccogliendo 945

pazienti con lesione acuta del tendine d'Achille: il trattamento prevedeva 4 settimane d'immobilizzazione in gesso in equino, sostituito successivamente da un tutore con tacco da ridurre ogni 15 giorni. I risultati hanno dimostrato un tasso di recidiva di lesione del 2.9% ed un soddisfacente recupero funzionale.

Riabilitazione funzionale e mobilizzazione precoce

È stato anche valutato il ruolo della riabilitazione funzionale e della mobilizzazione precoce anche dopo riparazione chirurgica della lesione. Uno studio randomizzato controllato su 50 pazienti ha messo a confronto l'utilizzo di un gesso con quello di un tutore che consente la plantarflessione della caviglia e la sua dorsiflessione fino a una posizione neutrale: questo approccio riabilitativo funzionale ha favorito un precoce recupero muscolare senza però aumentare il tasso di recidiva[9]. Recentemente è stata anche pubblicata una revisione sistematica[10] con l'obiettivo di identificare ed evidenziare i parametri che caratterizzano la riabilitazione precoce nelle lesioni del tendine d'Achille. Gli Autori sono riusciti a concludere che il carico immediato può essere considerato sicuro ma il tipo di ortesi da utilizzare, il grado ottimale di plantarflessione e l'adeguato periodo di utilizzo dell'ortesi non sono ancora stati valutati in maniera soddisfacente in letteratura.

DISCUSSIONE

Nonostante i molti studi presenti in letteratura non c'è ancora accordo sul miglior approccio alle lesioni del tendine d'Achille. Le lesioni del tendine d'Achille costituiscono una patologia molto importante per quantità di casi e per l'importante disabilità che causano. Negli anni sono stati fatti molti studi su questo argomento ma senza arrivare ad un soluzione definitiva. L'approccio chirurgico è attualmente considerato l'alternativa migliore in pazienti giovani senza particolari patologie e con alte richieste funzionali. Allo stesso tempo però il trattamento conservativo, specie se associato ad una riabilitazione con carico e mobilizzazione precoce, sta dando risultati convincenti. Attualmente è stato dimostrato che il carico e la mobilizzazione precoce sotto stretto controllo clinico non causano un aumento delle complicanze. In definitiva, non esiste nessun tipo di standardizzazione sulle tempistiche da seguire e sul tipo di ortesi da utilizzare. Inoltre per confermare ulteriormente questi dati servirebbero studi con casistica più ampia ed eseguiti in maniera più sistematica.

È però molto importante ricordare che nella maggior parte dei casi ad una lesione acuta si associa un quadro degenerativo spesso legato a patologie sistemiche del paziente. Per questo motivo è molto importante il ruolo del fisiatra che dovrebbe considerare in modo complessivo il paziente con le sue patologie, il tipo di lesione a cui è andato incontro e il tipo di intervento a cui è stato sottoposto. È necessario quindi un buon lavoro d'equipe tra il chirurgo che opera il paziente, il fisiatra che imposta il progetto riabilitativo personalizzato ed il fisioterapista che sarà responsabile dell'attuazione del programma.

CONCLUSIONI

In considerazione dell'incidenza in continua crescita delle lesioni del tendine d'Achille e dell'importante morbidità che questo tipo di lesione crea sarebbe molto importante individuare il miglior approccio terapeutico attraverso la produzione di linee guida condivise ortopedico-fisiatra-riabilitatore-medico dello sport.

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Correlations between Chiari II malformation and brainstem auditory evoked potentials (BAEPs) in infants with myelomeningocele

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Chiari malformations are classified by the severity of the disorder and the parts of the brain that protrude into the spinal canal; Type II, also called classic Chiari Malformation, involves the extension of both cerebellar and brain stem tissue into the foramen magnum; also, the cerebellar vermis (the nerve tissue that connects the two halves of the cerebellum) may be only partially complete or absent; Type II is usually accompanied by a myelomeningocele, a form of spina bifida that occurs when the spinal canal and backbone do not close before birth, causing the spinal cord and its protective membrane to protrude through a sac-like opening in the back. A myelomeningocele usually results in partial or complete paralysis of the area below the spinal opening. The term Arnold-Chiari malformation (named after two pioneering researchers) is specific to Type II malformations. Chiari II malformation is present in patients with myelomeningocele (1,2), but newborn infants are usually asymptomatic. Individuals with CM may complain of neck pain, balance problems, muscle weakness, numbness or other abnormal feelings in the arms or legs, dizziness, vision problems, difficulty swallowing, ringing or buzzing in the ears, hearing loss, vomiting, insomnia, depression, or headache made worse by coughing or straining. Hand coordination and fine motor skills may be affected. Symptoms may change for some individuals, depending on the buildup of CSF and resulting pressure on the tissues and nerves. Adolescents and adults who have Chiari Malformation but no symptoms initially may, later in life, develop signs of the disorder.

Infants may have symptoms from any type of Chiari Malformation and may have difficulty swallowing, irritability when being fed, excessive drooling, a weak cry, gagging or vomiting, arm weakness, a stiff neck, breathing problems, developmental delays, and an inability to gain weight. Infants who develop brainstem dysfunction most commonly do so between two weeks and three months of age; the symptoms that result are stridor, obstructive or central apnea, breath-holding spells and dysphagia. In older children and adolescents Chiari II malformation usually causes cervical cord and cerebellar symptoms, but brainstem symtoms may also arise de novo.

Brainstem auditory evoked potentials (BAEPs) precisely assess conduction in the auditory pathways through the brainstem.

Brainstem auditory evoked potential (BAEP) tests evaluate how the nervous system, specifically the brainstem, responds to specific sounds. BAEP tests are used to evaluate acoustic neuromas, brain stem tumors, hearing disorders, coma, brain death and demyelinating diseases. They are also used to evaluate hearing loss in infants, small children, and other patients unable to give voluntary subjective responses to traditional hearing tests.

During a BAEP test, two electrodes are attached to the patient's scalp, and one is attached to each earlobe. Ear phones placed over the patient's ears deliver a series of tones or clicks to each ear separately. The electrodes record hundreds, sometimes thousands, of electrical responses from the patient's brainstem, and these responses are recorded by a special computer for interpretation by a physician.

MATERIALS AND METHODS

Fifty-six newborn infants with myelomeningocele, who had BAEPs at 31 days of age, comprised the study population: 28 were male and 33 were female. The median age at which the BAEPs were done was sixteen (range two to 31) days. The median follow-up for the 37 subjects was 36 months. The control group consisted of 22 newborn infants (mean age: 27 days). BAEPs were obtained in accordance with the guidelines of the American Electroencephalographic Society (3); they were elicited by 100ps clicks presented at a rate of 11.1/s. Both rarefaction- and condensation-phase clicks were used in separate runs. Gold-plated surface electrodes were attached by collodion technique to the scalp at the vertex of the head (Cz) and to the left and right ears (A1 and A2). Electrode impedances of < 2kΩ were achieved. The only IPL measured was I-V, since fusion of wave-forms III, IV, and seen frequently in the study population. None of these infants had clinical signs or symptoms of brainstem dysfunction, none had absent obligatory waves and none had any abnormal intensity/latency functions to suggest audiological disturbance. The mean plus three standard deviations (99th centile) of the I-V IPLs of this group of newborn infants was 5.79ms, which matched that of the infants studied by Krumholz *et al.* (4).

RESULTS

32 of the 56 infants had abnormal BAEPs; no subject had symptoms of brainstem dysfunction at the time the BAEPs were done; of the 112 acoustic pathways evaluated (right and left pathways for each of 56 infants), 56 had normal wave-form morphologies, 21 had fused III, IV and V wave-forms and 35 had some other wave-form morphological abnormality, such as absence of an obligate wave form. Fused III-IV-V wave-forms were found in one or both ears of six of the 18 infants who developed symptoms, compared with six of 38 who remained asymptomatic. Subjects with thoracic-level spinal lesions did not have a significantly longer mean averaged I-V IPL than those with lower-level lesions. Of 30 infants who developed brainstem dysfunction at a median age of

three months 27 had abnormal neonatal BAEPs. In contrast of 26 infants who did not develop brainstem dysfunction at a median age of three months 15 had abnormal BAEPs. The mean average I-V interpeak latencies was greater among those who developed brainstem dysfunction than among those who did not.

DISCUSSION

The frequency of subjects with abnormal BAEPs in our study was 57 per cent (32/56). This is comparable to that reported by Holliday and colleagues (5) (66 per cent) and Worley and colleagues (6) (56 per cent).

In this study the mean of the averaged I-V IPLs was greater in those who developed brainstem symptoms than in those who did not and BAEPs were more frequently abnormal among infants who later developed brainstem symptoms than among those who did not. This finding suggests that a functional abnormality of the brainstem predates the development of symptoms in asymptomatic infants with myelomeningocele.

Based on the positive predictive value of 0.52 and negative predictive value of 0.94, newborn infants with myelomeningocele can be assigned by BAEPs to groups on the basis of risk for subsequent development of brainstem dysfunction.

All 56 subjects in our study had BAEPs early in infancy (31 days of age or less), before the development of brainstem dysfunction and were followed to a median of 36 months. Seven of the 19 subjects in our study who eventually developed brainstem dysfunction were still asymptomatic at four months of age, but subsequently developed problems.

Subjects with thoracic-level lesions did not have significantly longer mean averaged I-V IPLs than those with lower lesions (6). BAEP abnormalities could not be correlated with the severity of meningomyelocele, nor was the predictive value of response in assessing potential risk of symptomatic Chiari malformation established (7).

Abnormal conduction in the auditory pathways is more frequently present among those asymptomatic newborn infants with myelomeningocele who later develop overt brainstem dysfunction than among those who do not.

CONCLUSIONS

This study has emphasized:

— abnormal BAEPs are frequently found in newborn infants with myelomeningocele (57 %: 32/56);

— (2) BAEPs in asymptomatic newborn infants with myelomeningocele who subsequently develop Chiari II-related brainstem symptoms are more frequently abnormal than in those who do not, and newborn infants who later develop symptoms also have longer mean averaged right and left I-V IPLs;

— (6) there is a relationship between the duration of the averaged I-V IPLs and the level of lowest brainstem tissue descent of the Chiari II malformation.

Neonatal BAEPs can identify a group of asymptomatic infants with myelomeningocele who need close follow-up for the subsequent development of brainstem dysfunction.

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Linfedema post mastectomia, il ruolo del bracciale elastocompressivo in associazione al trattamento decongestionante complesso

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In Italia oltre mezzo milione di donne vive con una precedente diagnosi di tumore della mammella.[1]. Nelle donne del Friuli Venezia Giulia il tumore della mammella si conferma la neoplasia più frequente, con circa 1.300 nuove diagnosi annue[2]. Il territorio dell'Azienda per i Servizi Sanitari Triestina (che coincide con quello della provincia di Trieste) è articolato su 4 distretti socio sanitari, ciascuno con un bacino di utenza di circa 60.000 persone. Nel 2001 è stato creato all'interno della Struttura Semplice Dipartimentale Riabilitazione (SSDR) del Distretto 4, un ambulatorio dedicato alla riabilitazione delle donne operate al seno. Dal 28/09/2007 la fornitura dei bracciali elastocompressivi previsti dalle linee guida per il contenimento dell'edema[3-5], è a parziale carico del Servizio Sanitario Regionale, con un rimborso dell'80% della spesa. Fino a quel momento la proposta dell'acquisto del bracciale a fine trattamento spesso non era accolta. Questo atteggiamento si è modificato con la fornitura diretta in continuità con il trattamento decongestionante complesso (TDC, noto anche come Terapia Fisica Combinata o Combined Physical Therapy – CPT), la prescrizione e il collaudo all'interno del servizio, l'addestramento all'uso e la verifica sul corretto utilizzo. Scopo di questo lavoro è valutare come l'introduzione della fornitura diretta del bracciale, in associazione al TDC, abbia inciso sul numero di prestazioni riabilitative ripetute e sul mantenimento dei risultati raggiunti.

MATERIALI E METODI

Sono state valutate le donne seguite dal 2005 al 2010 in un ambulatorio dedicato alle operate al seno[6]. Queste presentavano edema di III-IV o V[7] stadio all'inizio del primo trattamento, avevano portato a termine il TDC presso la nostra struttura, avevano indossato il bracciale, se prescritto, ed erano tornate su richiesta del MMG. Sono state escluse le donne per le quali non erano disponibili dati di follow up a distanza di almeno 5 mesi dalla fine della terapia. La circonferenza media del braccio è stata calcolata dalle circonferenze misurate a: 2 cm dall'ascella, metà braccio, piega del gomito, metà avambraccio, polso. Tutte le circonferenze sono state ripetute all'inizio del trattamento (T1), al termine (T2) ed al follow up (T3) quando le pazienti si sono ripresentate alla visita fisiatrica. Variabile outcome secondaria è stata la durata dell'intervallo fra fine trattamento e follow up. Le variabili indipendenti considerate sono state: uso del bracciale, età all'arruolamento, le date di intervento chirurgico (T0), presa in carico, fine trattamento e follow up, il tipo di intervento (mastectomia o quadrantectomia) e tre variabili dicotomiche: dissezione ascellare, chemioterapia, radioterapia. I dati sono stati raccolti con il programma Epi info ed elaborati con SAS Enterprise Guide 4.3. Le eventuali differenze fra le esposte (uso del bracciale) e le non esposte (non uso del bracciale) sono state valutate con il test t di Student, l'ANOVA o il test di Wilcoxon a seconda dei casi.

RISULTATI

Sono stati valutati 95 trattamenti a carico di 81 pazienti. In tabella I le caratteristiche dei casi in cui era stato fornito il bracciale (n=67) e di quelli in cui non era stato fornito (n=28). Il 96% dei bracciali era di classe compressiva 2, il 54% era preconfezionato. Non è emersa nessuna differenza statisticamente significativa (chi quadrato di Pearson).

L'età media alla presa in carico tra esposte al bracciale e non esposte era, rispettivamente, 66,2 (DS 11,8) e 67,5 (DS 12,1). Non è emersa nessuna differenza statisticamente significativa. L'anno dell'intervento va dal 1971 al 2010, senza differenze statisticamente significative fra uso e non uso del bracciale. L'anno della presa in carico (1°, 2° e 3° quartile) risulta invece più recente per le donne con bracciale: 2006, 2008, 2009 vs. 2005, 2006, 2008 (P=0,0313 test di Wilcoxon). La durata dell'intervento (calcolata come differenza fra le date di fine ed inizio terapia) va da 0,3 a 7,2 mesi (senza differenze statisticamente significative fra i due gruppi). Il tempo fra la fine del trattamento ed il follow up (tabella II) risulta invece più lungo nei casi trattati con il bracciale (P = 0,0052; test di Wilcoxon).

Tabella I. — *Uso del bracciale (n = 67/95) e variabili dicotomiche esplorate.*

BRACCIALE	No		No	
chemioterapia	45	74%	22	65%
radioterapia	36	68%	31	74%
mastectomia	39	72%	28	68%
linfoadenectomia	60	70%	7	78%

Tabella II. — *Mesi fra fine del trattamento fisioterapico e follow up*

bracciale	n	1° quartile	2° quartile	3° quartile	Minimo	Massimo
no	28	6,41	7,46	10,13	4,7	12,23
si	67	7,4	8,8	13,2	5,1	20,8

Tabella III. — *Circonferenza media (cm) a fine trattamento – circonferenza media a inizio trattamento (valori negativi significano una riduzione nel tempo della circonferenza media)*

bracciale	n	1° quartile	2° quartile	3° quartile	Minimo	Massimo
no	28	- 0,7	- 0,36	-0,06	- 1,5	0,82
si	67	-1,34	- 0,74	- 0,4	- 2,64	0,6

Non ci sono differenze statisticamente significative nelle differenze fra le circonferenze medie al follow up ed alla fine del trattamento, mentre invece le donne con bracciale hanno una maggior riduzione della circonferenza media fra inizio e fine trattamento (tabella III) (P = 0,0223; ANOVA ad una via).

Alla fine del trattamento la circonferenza media risultava in tutti i casi ridotta di 0,8cm ± 1,0 (media e DS), riduzione statisticamente significativa (P<0,0001 al t-test di Student).

DISCUSSIONE

La durata del trattamento è stata piuttosto variabile, in quanto fortemente influenzata dal fatto che spesso le pazienti durante il programma sono state sottoposte a chemioterapia o radioterapia che hanno interferito con la continuità del trattamento. La casistica considerata evidenzia come l'uso del bracciale aumenti il periodo di mantenimento dei risultati conseguiti con la TDC. I due gruppi studiati risultavano diversi, per quanto riguarda i parametri presi in considerazione, solo per l'uso del bracciale tra anno dell'intervento, tempo fra intervento e presa in carico, età alla presa in carico, aumento dell'edema al follow up rispetto alla fine del TDC. L'anno della presa in carico è più recente per le donne con bracciale, ma i protocolli di intervento non sono variati nel tempo. Da considerare invece il miglioramento dell'edema alla fine del TDC, più cospicuo (P = 0,0223) nelle donne con bracciale, ma si tratta comunque di differenze minime (-0,74 vs -0,36 cm).

CONCLUSIONI

Le pazienti che indossano il bracciale ritornano al nostro servizio con tempi più lunghi rispetto a chi non lo indossa. Concordiamo con la necessità di un continuo aggiornamento delle linee guida esistenti sempre più basate sull'evidenza[8] e consideriamo interessante la possibilità di modificare il nostro approccio adottando oltre al trattamento, un modello prospettico di sorveglianza[9] per gestire al meglio le problematiche presenti nel linfedema.

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Effectiveness of shock wave therapy in the treatment of chronic tendinopathies and long bone non-unions

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In the last decades extracorporeal shock wave therapy (ESWT) has been widely used for the treatment of chronic tendinopathies and non-union of long bone fracture. A lot of experimental studies in animals explored the mechanisms of its effect, which was proved after that in clinical practice. The aim of this review is to assess the level of evidence about the effectiveness of SWT in musculoskeletal disorders based on search in the literature and to share own experience.

Literature search was conducted, using Pubmed Medline, Cochraine database of Systematic reviews.

DISCUSSION

Shock wave differs from ultrasound wave that is biphasic and has a peak pressure of 0.5 Bar. Shock wave is mono-phasic and the peak pressure is much higher – 500 Bar. Extracorporeal shock waves (ESW) are sonic pulses with broad frequency spectrum (16-20 MHz), steep pressure rise, high peak pressure (120 MPa), short duration (0.3 µsec), therapeutic effect in the body up to 12 cm. Radial shock waves have longer rise time and duration, lower peak pressure (0.10 MPa) and depth of penetration. They propagate radially in the human body with the focal point of energy achieved on the top of the applicator (1, 2). There are two basic effects of SW; direct mechanical forces, usually at interfaces with a jump in acoustic resistance, which depending on the intensity could cause mechanical destruction of cells, membranes and bone trabecule as well as the stimulation of cells through reversible deformation of the cell membrane; the secondary effect is the indirect mechanical force caused by cavitation and the formation of micro-jets with high amount of energy.

The indications for shock wave therapy, approved by the International Society for Medical Shock Wave Treatment are chronic tendinopathies: rotator cuff syndrome with or without calcification, plantar fasciitis with or without heel spur, lateral elbow epicondylitis and other insertional tendinopathies. Other indications is impaired bone healing function (delayed bone healing, pseudoarthrosis) and avascular necrosis of the femoral head. The vast majorities of published papers (RCT, cohort studies, reviews) show positive effects of SWT, although there are some controversies.

Calcifying tendinitis of the shoulder

There is good level of evidence about the effect of shock wave therapy in patients with **calcifying tendinitis of the shoulder**. Most of the studies found statistically significant better results regarding shoulder function, pain and size of calcifications, compared with placebo treatment with a success rate ranging from 78% to 91% (3). The effect is better and comparable to the results of surgical intervention in patients with grade II to Gartner classification. (4). Since it has been found by Rompe *et al.* that the effect is dose dependent, the proper dosage concerning the number of impulses and their energy flux density should be considered (5). In a systematic review Mouzopoulus G. *et al.* concluded that better clinical results, including pain relief and deposit resorption are associated with high energy level application (6). The study of Iepollo found also that the application of shock waves with intensity 0.2 mJ/mm2 gives better results than with 0.1 mJ/mm2 (7). A recent systematic review found that both high-energy ESWT and low-energy shock wave treatment are effective in chronic rotator cuff syndrome with calcium deposits (8). The duration of effectiveness is 2-3 years. Radial shock wave therapy is also effective: calcification disappeared completely in 86.6% in the patients from the treatment group compared to 8.8% partial resorption in the control group in a RCT of Cacchio *et al.* (9). There is insufficient evidence about the effect in non calcifying tendinopathy. No additional effect of ESWT with local anaesthetic compared to sham ESWT was found by Speed *et al.* (10). A very recent study of Galasso *et al.* found good short term effect regarding pain and function after the application of SWT with 0.07 mJ/mm2 EFD (11).

Plantar fasciitis

There is considerable level of evidence about the effect of shock wave therapy in **plantar fasciitis,** although there are still some controversies. Crawford *et al.* in a systematic review of 19 RCT found conflicting evidence about the effect of low energy ESWT for reducing pain in the shorter term and concluded that its effectiveness remaind equivocal (12). A lot of other studies proved its beneficial effect regarding pain and functional scores. Both focused (0,35 mJ/mm²) and radial shock waves were found to be effective. There were similar functional results on comparison of SWT and surgical treatment. Lohrer H *et al.* compared the effect of focused and radial shock wave therapy and concluded that focused is superior for recalcitrant plantar fasciitis (13). A very recent systematic review of Chung *et al.* finds that according to traditional meta-analysis – medium and high intensity FSWT show higher success rates and pain reduction than placebo, while low intensity SW have less convincing effect. But the network meta-analysis finds that best therapy for plantar fasciitis is radial SWT, followed by low-, medium- and high-intensity FSW (14).

Lateral epicondylitis

There is conflicting evidence about the effectivity of SWT. In a Cochraine review of Buchbinder from 2005 he concluded that there is „platinum level of evidence", that shock wave therapy provides little or no benefit in terms of pain and function in lateral elbow pain (15). Good results were found in a lot of other studies. The study of Petrone *et al.* demonstrate that low-dose SWT without anesthetic is a save and effective treatment for tennis elbow with long term effect (16). It is very important to follow the indications regarding the inacute phase and the appropriate dosage. Promising results were found by Spacca *et al.* after the aplication of radial SWT (17). The recent review of Storheim, concluded that radial SWT is effective in lateral elbow epicondilities (8). Our personal experience also confirms these findings. In a prospective study of patients with „tennis elbow" we found statistically significant reduction of pain at rest (from 3.75±0.49 to 2.44±0.39, $p<0.05$), palpation (from 7.44± 0.38 to 4.69±0.51) and Thomson test (from 5.87±0.46 to 3.5±0.29) after the application of 5 sessions of radial SWT and the results were preserved at the follow up at 3, 6 and 12 month. The patient rated tennis elbow evaluation (PRTEE) also showed statistically significant improvement in pain, functional and total score (from 56.75±2.34 to 39.38±3.96, $p<0.05$) after treatment and at the follow up till the 12 month (13.69±4.48) (18).

Achilles tendinopathy

There is good level of evidence about the effectiveness of SWT. Rompe *et al.* found statistically significant gain in adding ESWT to eccentric loading exercise in patients with Achilles tendinopathy (82% improved compared to 38% in the exercise group) (19). Similar are the findings of Rassmunsen *et al.* and Peers. (20,21). Better results are found in insertional than mid-substance Achilles tendinopathy (21).

Patellar tendinopathy

A review of Leeuwen (17 RCT) concluded that SWT is more effective and safer than traditional conservative treatments in chronic patellar tendinopathy. (22). A very recent study of Furia found that a single session of low-intensity SWT is very effective in patellar tendinopathy (23).

SWT in bone disorders

SWT proved to be effective in the treatment of delayed union or non-union after fracture of the long bones with success rate from 50% to 85%. Recently Elster *et al.* reported 80.2% success in 172 non-union of tibia (24). The results seem comparable to surgical intervention.

Bilogical mechanisms

An inflammatory mediated process is discussed. Basic research has found proinflammatory neuropeptides, chemotaxis and mitosis of stem cells and as a result bony or connective tissue matrix is produced. SWT stimulates local neo-angiogenesis with an early release of angiogenesis related markers (VEGF) and endothelial NO synthase. Blood circulation and vascularization are increased. Local metabolism is stimulated. NOS also stimulates mesenchymal cell proliferation and differentiation in the area of bone defect and is involved in new cartilage and bone formation. SWT promotes tendon healing by inducing TGF-ß1 and insulin growth factor (IGF) – I. Increased expression of PCNA was also registered (25, 26).

The pain-relieving effect is assigned to gate-control mechanism, damaging of the membrane of the neuron cell or increasing its permeability, degeneration of intracutaneus CGRP-ir sensory nerve fibres, reduction of the expression of CGRP in dorsal root ganglia, changes in P-substance.

CONCLUSIONS

ESWT has beneficial effects in the treatment of chronic tendinopathies and non-unions of the long bones, based on a growing amount of evidence. It could be recommended in chronic musculoskeletal disorders, recalcitrant to other conservative methods.

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Sinergismo d'azione tra protocollo riabilitativo ed anti-TNFα versus terapia biologica

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La spondilite anchilosante è una malattia infiammatoria cronica ad eziologia sconosciuta che colpisce prevalentemente lo scheletro assile ma che può coinvolgere anche le entesi periferiche. In molti casi la malattia è progressiva ed è causa di disabilità di grado non inferiore a quella provocata dall'artrite reumatoide. (1,2)

La prevalenza globale è attorno allo 0,1-0,2%. La patologia esordisce in età giovanile in un'età compresa tra i 20-40 anni e meno del 5% dei casi ha un'esordio ad un'età superiore ai 45 anni. Ha una netta prevalenza, almeno nelle forme più classiche, nei maschi rispetto alle femmine con un rapporto di 3-4:1. Di solito l'espressione clinica è più severa negli uomini mentre le donne hanno un impegno vertebrale meno importante e sono più sintomatiche per l'interessamento di anche, ginocchia, caviglie e polsi. (3)

L'immunogenetica ha confermato di recente il ruolo dei fattori genetici evidenziando come il 96% dei pazienti affetti risulti positivo per l'allele HLA-B27, presente nel 7% della popolazione bianca.

L'eziologia e la patogenesi rimangono ignote. I dati dell'epidemiologia genetica riguardanti il ruolo dell'associazione spondilite ed allele HLA-B27, suggeriscono che la malattia sia dovuta ad una risposta immune a stimoli ambientali (verosimilmente infettivi) in soggetti geneticamente suscettibili. (4,5)

Il tipico sintomo d'esordio è rappresentato da dolore localizzato alla regione presacrale e alle natiche per interessamento delle articolazioni sacroiliache, talvolta riferito alla regione della cresta iliaca o del grande trocantere, con possibile estensione alla coscia e al poplite fino alla metà prossimale del polpaccio (sciatica mozza). Sebbene all'inizio il dolore sia monolaterale o alternante, entro pochi mesi diventa persistente e bilaterale coinvolgendo anche il tratto lombare, associandosi a rigidità che si accentua al mattino e si riduce con il movimento, con durata superiore ai 15 minuti.

Oltre a questo esordio tipico, la malattia può comparire nel 10% dei casi con dolore di tipo sciatico, trafittivo alla regione presacrale e ai glutei, accentuato dai movimenti di torsione; nel 15% dei casi e tipicamente nella forma giovanile, esordisce con una monoartrite periferica agli arti inferiori (ginocchio-caviglia). Altre volte il dolore è a carico delle entesi del piede (tendine di achille e fascia plantare), del cingolo pelvico (tuberosità ischiatica, legamento ileo-lombare) o del torace all'inserzione dei muscoli intercostali. (6,7)

Tipica dei soggetti di sesso maschile e nel 20-30% dei casi, è la maggior frequenza della progressione dell'impegno assiale fino all'anchilosi diffusa, con rigidità ingravescente del rachide e dei cingoli, ridotta mobilità del torace e gravi deformità posturali con impotenza funzionale delle coxofemorali e delle spalle, caratterizzandosi l'immagine "dell'uomo che non guarda più il cielo".

MATERIALI E METODI

Presso l'ambulatorio dell'U.O.C. di Riabilitazione dell'A.U.O.P. "Paolo Giaccone" di Palermo, in diciotto mesi (Aprile 2011–Maggio 2012), sono stati arruolati 24 soggetti (6 donne–18 uomini), affetti da Spondilite Anchilosante HLA B27 diagnosticata secondo i criteri europei.

I parametri di inclusione sono stati: età compresa tra i 30-60 anni, pazienti in trattamento farmacologico con biologico e nessun programma riabilitativo nei sei mesi precedenti l'avvio dello studio. I criteri d'esclusione comprendevano comorbidità e terapia farmacologica con FANS.

Scopo dello studio è stato valutare l'efficacia di un protocollo riabilitativo associato a terapia con anti-TNFα versus soggetti sottoposti al trattamento biologico, sia in termini di riduzione della sintomatologia algica che di recupero e mantenimento del range articolare.

I soggetti sono stati suddivisi in modo random in 2 gruppi uno sperimentale (A) e uno di controllo (B), comprendenti 12 pazienti cadauno. Il primo è stato sottoposto, con cadenza bisettimanale per 20 sedute, a rieducazione funzionale di gruppo associata all'assunzione di farmaci biologici. Il gruppo di controllo ha eseguito terapia con anti-TNFα. La valutazione clinica è stata realizzata alla visita basale (T0), a 5 settimane (T1) e alla fine del trattamento (T2) a 2 mesi, inoltre i pazienti sono stati rivalutati a 6 mesi (T3), mediante la scala VAS, il questionario BASFI, il BASDAI, il BASMI e l'HAQ-S.

Il programma riabilitativo prevedeva 3 fasi (Fig. 1):

Figure 1. — Programma riabilitativo.

— Fase di riscaldamento: comprensivo di 10 minuti di esercizi aerobici e di 12 di stretching.

— Fase centrale: comprensiva di 15 minuti di esercizi posturali e di rinforzo muscolare.

— Fase finale: comprensiva di 5 minuti di ginnastica respiratoria e di 12 minuti di allungamento.

RISULTATI

Dall'analisi dei dati si è evidenziata una rapida riduzione della sintomatologia algica ed un miglioramento della mobilità del rachide, quest'ultimo mantenuto sino al follow-up a 6 mesi per il gruppo sperimentale A rispetto al controllo B.

L'indice VAS medio al tempo base per il gruppo A era di 8.25, per il gruppo B di 7.9. I questionari BASFI, BASDAI e BASMI riportavano un valore medio al basale rispettivamente per il gruppo A di 32.8, 50.2, 5.8 mentre per il gruppo B rispettivamente di 32.2, 50, 5.8. Infine l'HAQ-S al tempo T0 era per il gruppo A di 31.3 e per il gruppo B di 30.9. A fine trattamento il valore medio di VAS era per il gruppo A di 5, per il gruppo B di 7.2; i valori medi per il BASFI, BASDAI, BASMI ed HAQ-S erano rispettivamente per il gruppo A di 26.3, 42.3, 4.1, 25, mentre per il gruppo B rispettivamente di 28.5, 49.1, 5.7, 29.4. Al follow- up, a sei mesi dal termine del trattamento i valori medi di VAS, BASFI, BASDAI, BASMI ed HAQ-S per il gruppo A erano rispettivamente di 4.8, 23.7, 41.6, 4 e 24.1 mentre per il gruppo B erano rispettivamente di 6.9, 28.5, 48.2, 5.4 e 29, dimostrando una differenza statisticamente significativa (Figg. 2-6).

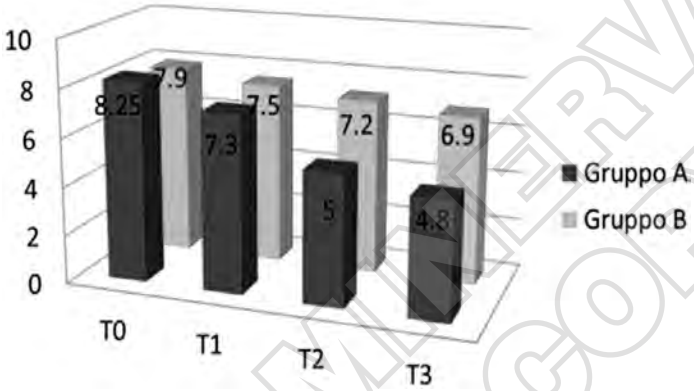

Figure 2. — VAS.

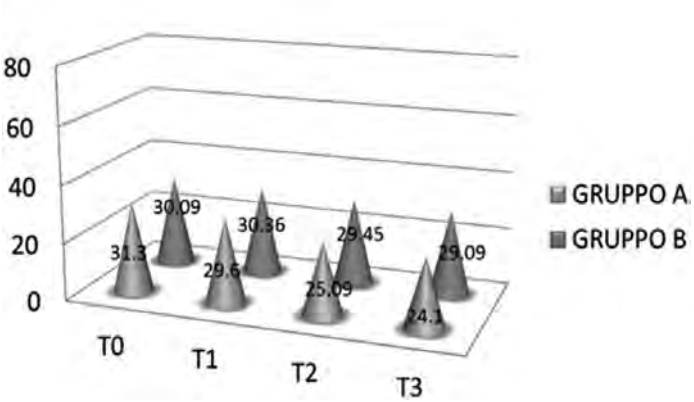

Figure 3. — HAQ-S.

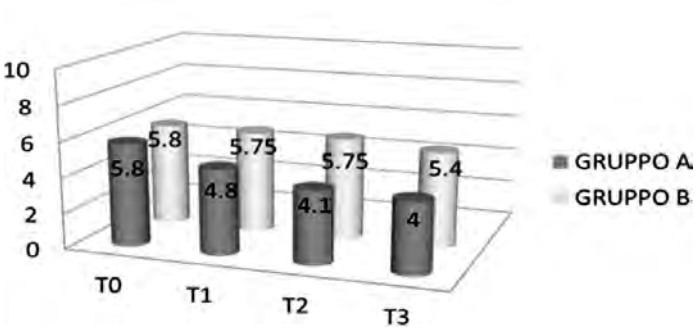

Figure 4. — BASMI.

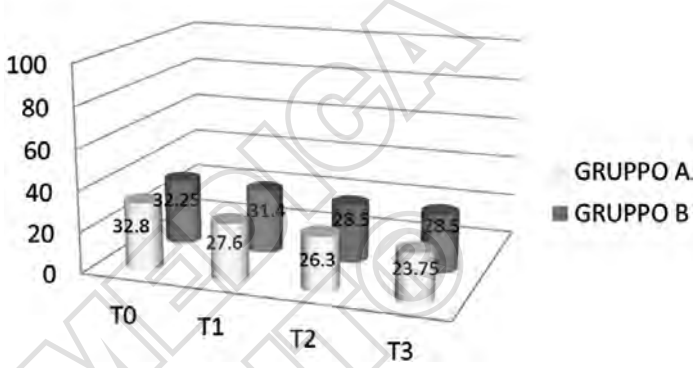

Figure 5. — BASFI.

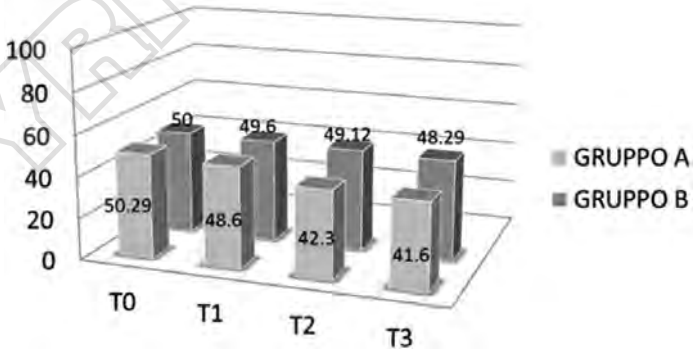

Figure 6. — BASDAI.

DISCUSSIONE

L'esecuzione del trattamento riabilitativo di gruppo ha dimostrato una buona partecipazione nello svolgimento dell'esercizio terapeutico, una maggiore presa di coscienza ed una migliore convivenza con la patologia. Soltanto a due pazienti, a causa del mancato controllo del dolore, è stata modificata la terapia farmacologica ed interrotto il trattamento riabilitativo. Dall'analisi della letteratura, emerge che la riabilitazione è un utile strumento terapeutico nel trattamento della spondilite anchilosante, sebbene siano necessari ulteriori studi a supporto di queste prime osservazioni.

CONCLUSIONI

Il presente studio ha mostrato efficacia nel trattamento di pazienti con SA mediante un progetto-programma riabilitativo mi-

rato e specifico per distretto articolare. Svolgere con regolarità e costanza l'esercizio terapeutico in associazione all'anti-TNF-α, ha permesso di ridurre rapidamente il dolore, mantenere nel tempo un'elasticità funzionale del rachide ed una postura corretta, permettendo così una migliore qualità di vita sociale e professionale.

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Neoplastic spinal cord injury: where does rehabilitation stand?

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Most studies focusing on Spinal Cord Injury (SCI) are centered on traumatic lesions. There isn't much wealth of information concerning non traumatic SCI, namely neoplastic causes. As mentioned in several studies, [1,2,3] the number of patients with SCI due to tumor is increasing. This is probably related to the population ageing as well as to improved survival across many cancer types, which is multifactorial and reflects improvement not only in cancer prevention and early detection but also in better diagnostic imaging and treatment [4,5]. As a result, the number of patients who are referred to rehabilitation services is increasing. According to some studies SCI resulting from neoplastic spinal cord compression accounts for 10% to 14% of all SCI admissions to rehabilitation units and 26% to 45% of nontraumatic SCIs [6]. On the other hand, specialized rehabilitation is usually provided to patients with traumatic SCI but not to patients who develop SCI due to cancer (primary and metastatic). So it is relevant to discuss the role that rehabilitation plays in the life of these patients.

Our objectives were to characterize neoplastic SCI patients admitted to a rehabilitation center and to analyze their clinical, neurological and functional evolution.

MATERIALS AND METHODS

This is a retrospective, descriptive study of discharged patients from a SCI unit of a Portuguese Rehabilitation Center, from January 2011 through June 2012. Clinical records from computerized databases and paper charts were reviewed. A total of 10 consecutive inpatients were identified to have neoplastic spinal cord injury. Patients with SCI due to other causes were excluded.

Data were collected for age, gender, and length of stay. Cancer data included type of tumor and treatment. Spinal cord compression data included neurological level and *ASIA impairment Scale* (AIS) score. Concerning function, we recorded *Functional Independence Measure* (FIM), *Spinal Cord Independence Measure* (SCIM) scores, bowel and bladder management and ambulation, both at admission and discharge.

Descriptive statistics were performed using Excel 2007® for Windows®.

RESULTS

In the selected period, 221 patients were discharged. Only 8 had a neoplastic spinal cord injury (3.6%). There was a prevailing of primary tumors (80%) versus metastatic ones.

62.5% of patients were female and 37.5% were male. The mean age was 60.9, with a minimum of 21 and a maximum of 87 years old. Of the 8 included patients, 7 had paraplegia and only one had quadriplegia. Incomplete lesions were the majority with 87.5% (AIS B 25.0%, AIS C 25.0%; AIS D 37.5%). The only patient with a complete injury was also the only one with a cervical lesion. There were 6 dorsal lesions and 1 lumbar lesion. Seven patients had previous surgical treatment, 2 of them received co-adjuvant therapy (1 patient had chemotherapy and the other radiotherapy) and there was 1 patient who had conservative treatment with a combination of chemo and radiotherapy. Half the patients maintained their vesical initial regimen, the other half improved (1 went from voiding using maneuvers to voiding by sensation, the other 2 patients who had indwelling started intermittent catheterization). Even though only 1 patient at admission had a satisfactory bowel program, by discharge all had regular bowel movements.

At admission 75% of the subjects used a wheelchair, 12.5% were bedbound and 12.5% used a walking aid. At discharge there was an improvement with 37.5% of patients walking independently with an aid.

We found a mean FIM of 75.8 at admission and of 93.9 at discharge. Mean FIM difference, between admission and discharge, was 18.1 with a minimum FIM difference of 0 and a maximum of 33. Mean SCIM score at admission was 37.4 and 58.8 at discharge. Mean SCIM difference was 21.4 with a minimum of 0 and a maximum of 40. Mean length of stay was 77.5 days. Two patients have died since being discharged from our center.

DISCUSSION

Concerning gender, age at admission and predominance of paraplegia and incomplete lesions, our data is consistent with the literature [6]. Barring a poor vital prognosis, functional outcomes are positive [7]. We didn't find any article using SCIM in this population in spite of it being the only functional recovery outcome measure designed specifically for SCI patients both traumatic and nontraumatic. It has been stated that SCIM is more sensitive to functional changes in SCI than FIM [8].

Although there was no improvement in neurological condition (as measured by AIS) we found progresses in activities of daily living performance (as measured by FIM and SCIM), in ambulation and bladder and bowel function.

Functional gains and an efficient pain management have shown to be even more important to improve quality of life of these patients, due to the aggressive treatments they endure (physical and psychological debilitating) [1,5].

Nevertheless, in our sample it is still an uncommon condition

accounting for only 3.6% of the total SCI patients, which is less than described in literature and accounts for the small dimension of our study. Also our sample had a small proportion of patients with metastatic lesions, in opposition to what is described in most studies, which can indicate that they aren't being referred to inpatient rehabilitation care. However, some patients are probably being followed at their local hospital's Physical Medicine and Rehabilitation department. Furthermore, when ambulatory treatment is possible, it might also be a satisfactory solution that allows for the patient's daily life to be as little disrupted as possible.

We think it would be interesting to evaluate pain at both admission and discharge as it has been shown to be an important factor, not only affecting quality of life but also the patient cooperation in the rehabilitation program.

CONCLUSIONS

Patients with neoplastic Spinal Cord Injury benefit from taking part in rehabilitation programs as functional outcomes are improved. There should be made an effort for raising other medical professionals' awareness of rehabilitation's role in this population. Nonetheless, it is often appropriate to favor palliative measures as the end of life nears.

In conclusion, a prospective multi centric study which compiled significant data would be essential for better understanding of rehabilitation outcomes and design of rehabilitation protocols tailored to the unique needs of this specific population.

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Persona con disabilità: un progetto riabilitativo incompiuto?

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ll modello biopsicosociale pone al centro del sistema il cittadino con disabilità ed il suo contesto globale nella prospettiva del miglior governo clinico da attuare attraverso la corretta individuazione e misura degli outcome.

L'utilizzo di tale modello, in un sistema a risorse limitate, permette ai professionisti del SSN di individuare un equilibrio tra la qualità delle cure per gli utenti e le esigenze finanziario –amministrative.

È necessario, però, definire il "percorso" per rendere l'obiettivo praticabile nella realtà del nostro operare quotidiano, con il supporto delle evidenze scientifiche.

Si tratta anche di un problema etico, perché l'alternativa è quella di non poter dare adeguata e giusta risposta ai bisogni e diritti delle Persone con disabilità con aumento dei costi sanitari e sociali (Fig. 1).

MATERIALI E METODI

La condivisione di casi clinici tra professionisti della riabilitazione di strutture territoriali di due ASL, ha fatto emergere le criticità presenti nella presa in carico riabilitativa e nei percorsi individuali di persone con disabilità afferenti alle nostre strutture.

Sono stati analizzati i fattori barriera che non permettevano di ridurre la disabilità e i fattori facilitatori che permettevano di migliorare il funzionamento delle persone e di rendere reale il loro Progetto di Autonomia e di Qualità della vita (Figg. 2, 3).

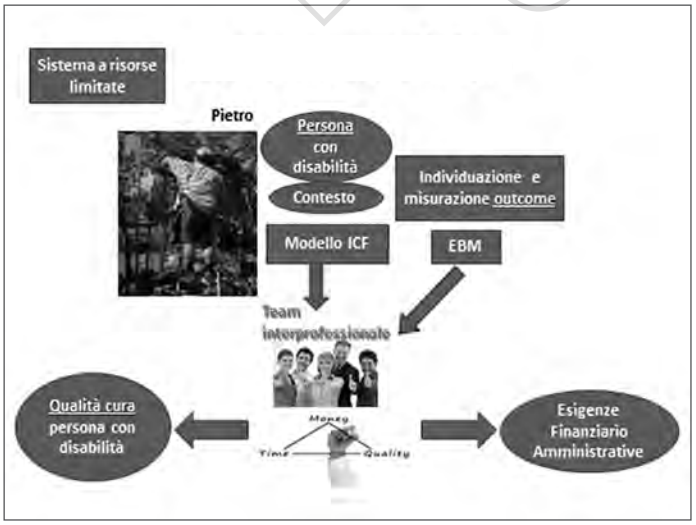

Figura 1. — Governance clinica.

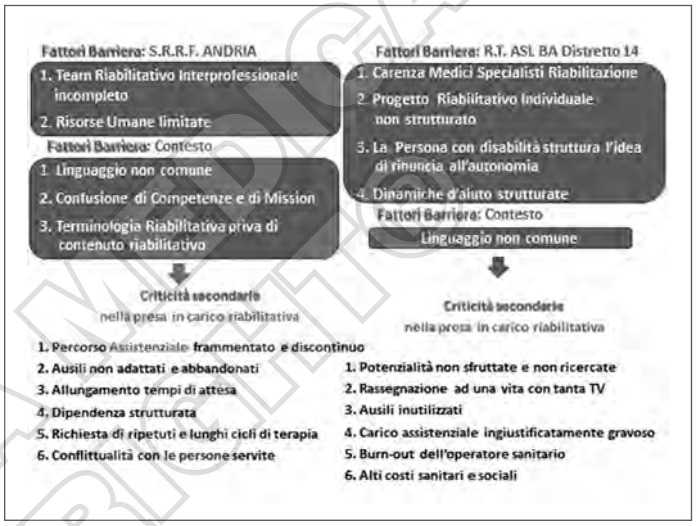

Figura 2. — Fattori barriera.

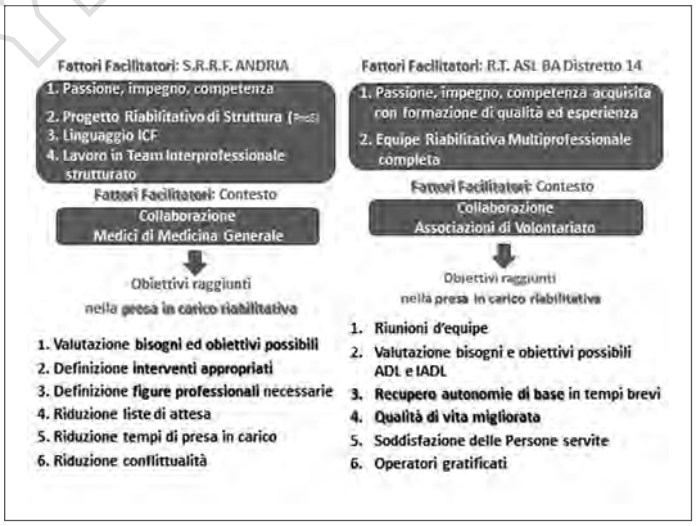

Figura 3. — Fattori facilitatori.

Le strategie operative utilizzate dai professionisti della riabilitazione delle due strutture, alla luce delle criticità riscontrate, per migliorare l'outcome della persona con disabilità sono state diverse perché diverse le esperienze professionali degli operatori, le storie ed i contesti delle due strutture (Fig. 4).

In una operativamente si è deciso di procedere innanzitutto a fotografare il fabbisogno sanitario riabilitativo espresso dalla popolazione assistita (domanda riabilitativa) tramite l'utilizzo della

Figura 4. — Prospettive.

classificazione ICD9-CM per valutare le patologie prevalenti ogni anno.

Tali dati non permettevano di definire gli interventi e le figure professionali necessarie.

La formazione degli operatori al "pensare in ICF" ha permesso di elaborare una nuova metodologia per fotografare il reale fabbisogno riabilitativo secondo il modello biopsicosociale e quindi di programmare l'offerta riabilitativa.

Dopo aver individuato in collaborazione con i Medici di Medicina Generale un Percorso riabilitativo possibile, è stato realizzato prima un poster informativo per i pazienti presente in tutti gli ambulatori dei Medici di Medicina Generale, oltre che nella struttura di riabilitazione territoriale e successivamente il "Manuale del paziente: corretto uso del servizio territoriale di Riabilitazione".

Tale manuale è nato dalla convinzione che una corretta informazione rende i cittadini più competenti e di conseguenza più coinvolti attivamente nel processo di miglioramento della risposta del servizio ai loro bisogni.

Scopi del manuale:

— promuovere la conoscenza del servizio riabilitativo territoriale con l'obiettivo di favorire una partecipazione responsabile della popolazione al corretto uso della struttura;

— facilitare il passaggio dalla cultura dell'assistenza (cicli fisioterapici 2-3 volte l'anno) alla cultura della partecipazione attiva della persona al progetto della sua autonomia e autosufficienza anche con adattamenti (comportamentali, ambientali, ausili riabilitativi) quando necessari.

Altri strumenti utilizzati: la riabilitazione narrativa, il counselling sistemico, l'educazione riabilitativa.

Fonte delle informazioni: la cartella riabilitativa interprofessionale (N. 5070 cartelle) con la scheda di dimissione ambulatoriale e domiciliare (DRG riabilitativi).

Nell'altra struttura di riabilitazione territoriale dell'ASL/BA Distretto 14 l'assegnazione della figura professionale di un Terapista occupazionale, così come raccomandato nel Piano di Indirizzo della Riabilitazione, si è rivelato un fattore facilitante nella realizzazione di un progetto di possibile vita autonoma. Inoltre grazie all'esperienza professionale maturata dal Terapista occupazionale in vari setting di cura (Casa di riposo, reparto di Medicina Riabilitativa, Servizio Territoriale di Riabilitazione) si è reso evidente come l'assenza di tale figura professionale nel Team Riabilitativo sin dalle prime fasi del percorso riabilitativo e nel passaggio ospedale-territorio si dimostra un fattore barriera al completamento del Progetto di autonomia e qualità di vita della persona con disabilità.

Si è riscontato che spesso il paziente ha discrete potenzialità d'autonomia, ma non reclutate, perché non conosciute, perché non sperimentate nel fare quotidiano. Pertanto, le dinamiche d'aiuto tra paziente e caregiver ingiustificate e ben strutturate non consentono di modificare il carico assistenziale, nonostante la continua fisiokinesiterapia. Il paziente ben presto si rassegna alla dipendenza, convinto di non poter fare più molte attività, si allungano i tempi di presa in carico, spesso con burn-out dell'operatore sanitario.

RISULTATI

Il "pensare in ICF" ha avuto un impatto positivo sull'elaborazione del Progetto Riabilitativo Individuale da parte dei due team interprofessionali riabilitativi ed ha contribuito a ridurre la conflittualità con gli utenti.

In particolare un'attenta analisi dei fattori ambientali (facilitatori e barriere) ha permesso di lavorare sul miglioramento delle performances riducendo i tempi di presa in carico e quindi i costi dell'intervento riabilitativo, con soddisfazione sia degli operatori che dei soggetti trattati e della famiglia.

CONCLUSIONI

Nonostante la passione, la competenza e l'impegno profuso dai professionisti della riabilitazione nel loro lavoro quotidiano, persistono numerose criticità.

Per facilitare il passaggio dalla cultura dell'Assistenza alla cultura dell'Autonomia e dell'Autosufficienza della persona anche con adattamenti, quando necessari, e migliorare ulteriormente l'Appropriatezza sia clinica che economica del Percorso riabilitativo che si misura dall'autonomia e dall'inclusione sociale della Persona con disabilità, (fig.5) si rendono indispensabili la formazione al "pensare in ICF" di tutti gli operatori della riabilitazione, l'informatizzazione per il necessario passaggio dal "pensare in ICF" al "codificare in ICF".

Importante sarà il pieno coinvolgimento delle Direzioni Aziendali e della Regione per l'integrazione nelle attuali piante organiche di figure professionali non presenti, ma indispensabili per la realizzazione del Progetto riabilitativo individuale (terapista occupazionale, infermiere della riabilitazione, tecnico ortopedico). Tale coinvolgimento permetterà di uscire dalle criticità attualmente presenti e di incamminarci in un percorso virtuoso.

La collaborazione con l'Ufficio Epidemiologia e Statistica potrà permetterci in futuro un'elaborazione dei dati sulla disabilità (*dati di morbilità* secondo gli assi principali della classificazione ICD9 e *dati di funzionamento* secondo la classificazione ICF), aprendoci nuove prospettive nell'indagine conoscitiva del fabbisogno riabilitativo e nella valutazione quali-quantitativa delle risorse necessarie a tutte le strutture riabilitative territoriali.

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Programma di addestramento per la persona mielolesa e il caregiver

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Il termine "autonomia" deriva dalle parole greche "autos" (se stesso) e "nomos" (regola o legge) e inizialmente era applicato alla capacità di governarsi con proprie leggi nelle città- stato greche; mentre ora non coinvolge soltanto lo stato ma anche il cittadino stesso, in particolare la libertà di parola e volontà e la condizione di essere libero e uguale agli altri, senza discriminazioni.(1) In ambito medico l'autonomia non è sinonimo d'indipendenza, ma è proprio la capacità di progettare la vita, di entrare in relazione con gli altri e di partecipare alla costruzione della società. La relazione si svincola su tre livelli: relazione con il sé, con gli altri e con l'ambiente; proprio per questa connessione la disabilità può interferire anche su un solo livello; di conseguenza questo richiede una ristrutturazione personale per una piena autonomia. (2). In questo percorso rientra anche la figura del caregiver, che deve saper anticipare, affrontare e risolvere le difficoltà che una persona con lesione midollare può incontrare quotidianamente nella gestione personale e nella relazione con gli altri (3). Per verificare il grado di autonomia dei pazienti con lesione midollare e le capacità di "presa in carico" del caregiver sono stati realizzati dei questionari da compilare durante i permessi d'uscita, autorizzati nel corso della degenza. È stato così possibile evidenziare le difficoltà che possono caratterizzare il rientro al domicilio (e/o in ambiente esterno), e monitorare l'attività assistenziale del caregiver. L'utilizzo dei questionari ha inoltre consentito al terapista occupazionale di finalizzare ulteriormente il proprio lavoro affinché il caregiver migliori la propria performance durante i permessi d'uscita.

MATERIALI E METODI

Per svolgere il lavoro è stato utilizzato un questionario composto da dodici domande che riguardavano le difficoltà riscontrate dal caregiver durante i permessi d'uscita, nei vari ambienti domestici e non. In questo studio sono stati reclutati sia i pazienti acuti che cronici, per un totale di sette pazienti. Tutti i degenti erano ricoverati presso l'Unità Spinale e hanno usufruito della possibilità dei permessi domiciliari nei mesi tra Marzo e Settembre 2011; i pazienti cronici non sono stati esclusi per rendere più esaustivi l'assistenza ed il lavoro svolto dai caregivers sia in pazienti paraplegici che tetraplegici. La finalità della somministrazione del questionario era quella di registrare in quali ambienti e in quali circostanze il caregiver avesse trovato maggior difficoltà e quali fossero le strategie utilizzate per affrontarle e superarle. Accanto ad alcune domande, inoltre, è stata inserita una VAS (Visual Analogical Scale) al fine di quantificare numericamente il livello di difficoltà durante lo svolgimento di determinate attività per poter tradurre graficamente i dati raccolti. La presentazione del questionario avveniva per la prima volta in un momento successivo alla prima uscita affinché il caregiver potesse realizzare le difficoltà incontrate e pianificare i consigli e l'addestramento fornito dal terapista occupazionale durante la degenza. La distribuzione del questionario proseguiva dopo ogni rientro del paziente dal permesso domiciliare, per valutare se il caregiver fosse in grado di adattarsi al nuovo ruolo e prestare assistenza e cura seguendo le indicazioni dell'equipe.

RISULTATI E DISCUSSIONE

Il questionario ha rilevato alcune difficoltà riconducibili alle osservazioni fornite dai caregiver. La principale difficoltà riscontrata è stata quella relativa ai trasferimenti, sia per l'ambiente esterno (carrozzina-auto), sia per il domicilio, in particolare carrozzina-divano e carrozzina-wc.

Nella tabella I è possibile individuare che su sette caregiver solo due non hanno trovato difficoltà nei trasferimenti, durante i permessi domiciliari, perché i familiari erano già stati educati e addestrati dal terapista occupazionale da lungo periodo, dato che assistevano pazienti cronici. La difficoltà nel gestire i rapporti interpersonali è stata evidenziata come la difficoltà. Su sette caregiver tre hanno trovato qualche difficoltà nelle relazioni con gli altri, pre-

Tabella I. — *Risultati.*

	Sesso	Età	Parentela	Difficoltà nei trasferimenti		Mesi/anni dalla lesione	Sesso	Età
Caregiver 1	Maschio	71	Compagno	4	Paziente 1	4 mesi	Femmina	65
Caregiver 2	Femmina	51	Moglie	5	Paziente 2	6 mesi	Maschio	55
Caregiver 3	Femmina	41	Moglie	1	Paziente 3	3 mesi	Maschio	43
Caregiver 4	Femmina	63	Madre	0	Paziente 4	15 anni	Maschio	33
Caregiver 5	Femmina	46	Convivente	5	Paziente 5	2 anni	Maschio	50
Caregiver 6	Femmina	55	Madre	0	Paziente 6	15 anni	Maschio	15
Caregiver 7	Maschio	33	Fidanzato	2	Paziente 7	10 anni	Femmina	30

Tabella II. — *Risultati.*

	Sesso	Età	Parentela	Hai avuto difficoltà nell'assistenza fisica?		Mesi/anni dalla lesione	Sesso	Età
Caregiver 1	Maschio	71	Compagno	Si	Paziente 1	4 mesi	Femmina	65
Caregiver 2	Femmina	51	Moglie	Si	Paziente 2	6 mesi	Maschio	55
Caregiver 3	Femmina	41	Moglie	No	Paziente 3	3 mesi	Maschio	43
Caregiver 4	Femmina	63	Madre	No	Paziente 4	15 anni	Maschio	33
Caregiver 5	Femmina	46	Convivente	Si	Paziente 5	2 anni	Maschio	50
Caregiver 6	Femmina	55	Madre	No	Paziente 6	15 anni	Maschio	15
Caregiver 7	Maschio	33	Fidanzato	Si	Paziente 7	10 anni	Femmina	30

ferendo un ambiente più sicuro e protetto come la casa, piuttosto che riallacciare vecchie e nuove relazioni sociali.

Nella tabella II è evidente che tre caregiver su sette hanno trovato difficoltà nell'assistenza fisica della persona miololesa. In particolare i problemi riscontrati erano legati sia al limitato residuo motorio, tanto che il familiare era costretto a fornire un aiuto molto importante; sia alla presenza di barriere architettoniche che non consentivano una piena autonomia di gestione.

CONCLUSIONI

Lo studio effettuato ha permesso di verificare le capacità e le difficoltà incontrate dal caregiver durante il rientro al domicilio. La somministrazione del questionario ha reso possibile la registrazione dei risultati per un confronto a lungo termine e poter attuare i vari accorgimenti da parte dell'equipe riabilitativa. Questo test ha permesso di monitorare nel tempo i miglioramenti acquisiti, grazie alle istruzioni date durante la degenza; senza tralasciare l'aspetto psicologico nell'affrontare situazioni difficoltose legate ad una nuova realtà sia per il paziente che per la famiglia. Inoltre lo studio è stato utile per verificare la validità e l'efficacia delle proposte fornite dai terapisti. Il questionario non ha preso in considerazione tutti gli ambiti per testare le difficoltà globali del caregiver, perché si sono ritenuti più importanti il domicilio ed il rapporto con amici e conoscenti, dato che rappresentano i due contesti in cui il paziente e la propria famiglia si sentono tranquilli e motivati ad affrontare la nuova condizione quotidianamente. Questa scelta ha consentito di intervenire direttamente sulle problematiche incontrate, grazie alla disponibilità e professionalità delle figure sanitarie in eqipe. In conclusione il lavoro si è rivelato utile per approfondire le tematiche e limitare le difficoltà maggiormente incontrate dal caregiver con l'utilizzo di nuove strategie.

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Clinical and instrumental analysis of a case of suspect idiopathic Pisa syndrome

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The Pisa syndrome is clinically defined by flexion of the trunk to one side and by its rotation and maintenance of a posture tilted sideways [1]. Initially, Pisa syndrome, also termed lateral trunk flexion (LTF) was described by Ekbom and colleagues [2] as a motor phenomenon appearing several days after starting of neuroleptic treatment. Over the years, it has also been related to cholinesterase inhibitors [3] and other dopamine receptors blockers (such as antiemetics) [4]. The term was subsequently applied to patients with Alzheimer's disease with and without neuroleptic exposure [5], in subjects with Lewy body dementia [6], and to those with Parkinson's disease [7]. However, it has also been reported, although less frequently, in patients who are receiving other medications and in normal subjects not receiving medication (idiopathic Pisa syndrome) [8]. The anatomical and neurochemical bases for idiopathic LTF are currently unknown [1]. As mentioned by several authors, the prevalence of idiopathic LTF is underestimated, due to variations in expression or misdiagnosis, and mild cases may never be identified because some affected individuals do not seek medical attention [8].

There are few studies investigating the electrographic patterns of muscular activation in LTF [9-10]. Moreover, EMG results and interpretation yielded contradictory conclusions about the possible pathophysiological model underlying this postural abnormality.

Therefore, more information both clinical and instrumental is essential to reach a clearer classification of the Pisa Syndrome. The aim of our study was the recruitment and reporting of cases of suspect idiopathic LTF in very old people.

MATERIALS AND METHODS

A study protocol is administered to those cases of elderly patients characterized by suspect segmental truncal dystonia recruited from our Movement Analysis Laboratory. Exclusion criteria are: Parkinson's disease, intake of neuroleptics, neurological diseases, osteoporosis with rachis deformity, labyrinth syndromes, scoliotic deviation greater than 20°, serious rheumoarthropathies, heterometry of the lower limbs. The study protocol includes the following clinical tests: CIRS (Cumulative Illness Rating Scale), Clarkson Testing, Tinetti Scale, V.A.S (pain evaluation), ADL (Barthel Index), IADL (Instrumental Activities of Daily Living),Walking Test, Standing Test, MMSE Short form, ICF Brief Minimal Generic Set, SF 12 Standard V1, ISEL Questionnaire. Instrumental analysis includes kinematic, kinetic and surface electromyographic analysis during standing (in open and closed eyes conditions), straight walking, and during the execution of the Functional Reach test. Six-camera SMART-D optoelectronic system (BTS), FREEEMG (BTS), 2 Kistler platforms and a Gait-rite system are used.

RESULTS

Results refer to a case study of a 80 years old woman, affected by suspect idiopathic Pisa syndrome but in good health status. MMSE= 10/10; BMI= 29; CIRS 1/52; ICF 4/28. Barthel Index 95/100; Tinetti balance 16/16; Tinetti walking 12/12. The deambulation functional index (FAP) was 96/100 (average value on 5 tests). The evaluation of the trunk on frontal plane shows a shift to the left of 2.5 cm between C7 and the buttock line. The patient feels no pain. Kinematic, kinetic, and surface electromyographic data are still under examination but preliminary results show reduced gait speed and reaching distance, longer stance phase and shorter steps, augmented pelvic tilt and hip flexion with enhanced hip flexion extension moment. Classical postural analysis, based namely on the morphological description of posturography, showed an increase in the average swing-side (Figures 1-4) both in terms of navigation speed. The electromyography posture shows the upper right trapezius to be more active than opposite side (Figure 5, 6).

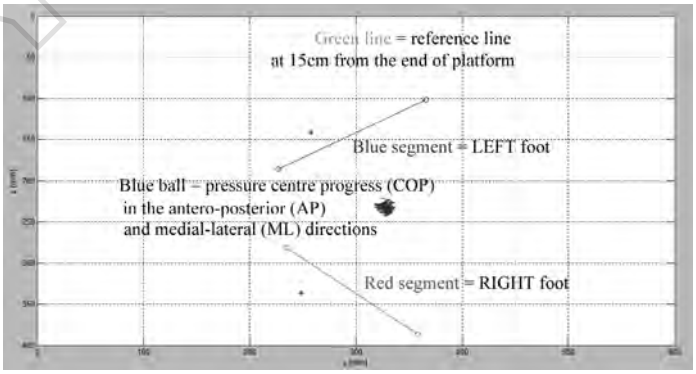

Figure 1.—COP PLOT between foots in the tests posturography - Eyes Open.

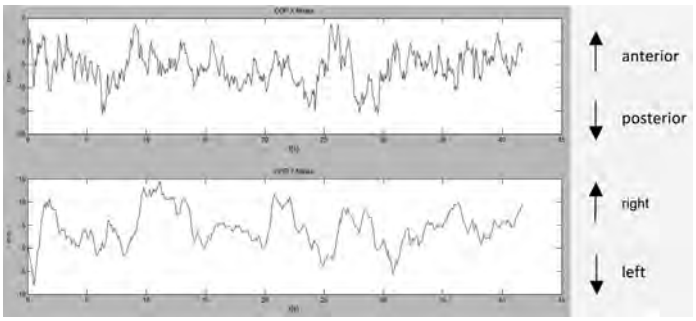

Figure 2.—Translation detail.

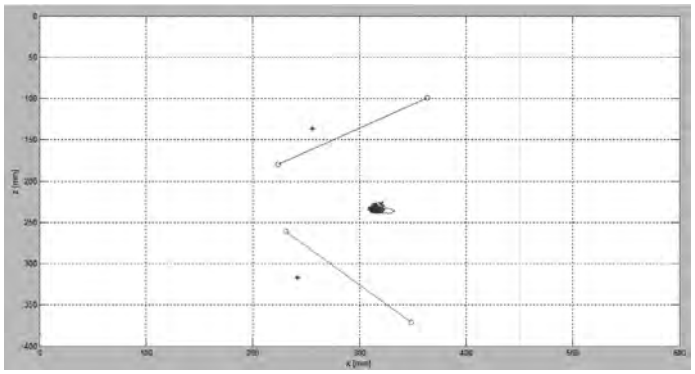

Figure 3.—COP PLOT between foots in the tests posturography - Eyes Closed.

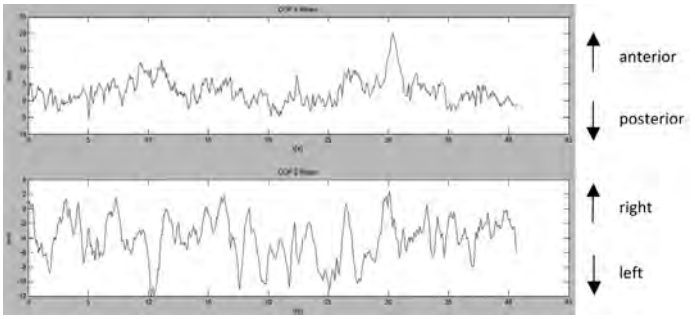

Figure 4.—Translation detail.

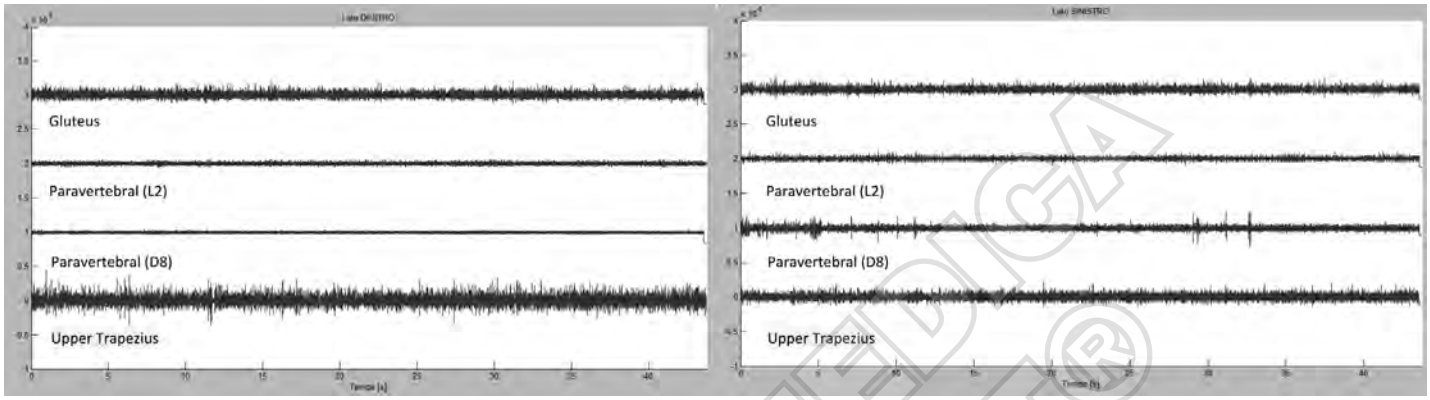

Figure 5.—Surface EMG in Eyes Open posture

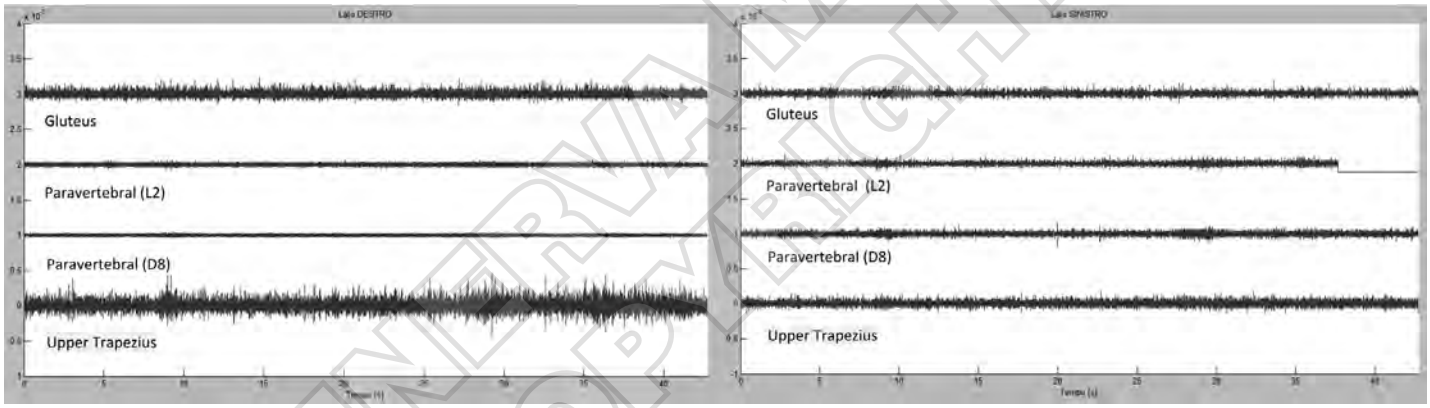

Figure 6.—Surface EMG in Eyes Closed posture.

DISCUSSION

Literature [11] relates the increase of side-swing with an increased risk of falling. Techniques of structural analysis of spatial and temporal progress of pressure centre, based on parameters obtained by "Sway Density" also show a greater instability, since the MP parameter (Mean Peak) is significantly lower than normal, indicating a minor subject's stay in "clusters" of stability identified by analysis. Also an increased MD (Mean Distance) indicates that between a cluster of stability and another there is, on average, a longer distance, probably due to a defective control of the sensory-motor system.

Moreover the electromyography posture doesn't show a clear right/left imbalance; only the upper right trapezius seems to be more active than opposite side.

CONCLUSIONS

The patient shows a considerable trunk shift. All clinical functional assessments seem good, given the old age. Clinical walking parameters are within normal limits, and whole body flexibility is apparently good. However, preliminary instrumental results show alterations at the functional level of the patient. This case study and those that will be examined in our laboratory, are expected to give additional information about this form of postural anomaly of the trunk and its impact on old people.

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Inter-operator repeatability of the manual assessment of cervical ROM in newborn infants with myogenic torticollis and positional plagiocephaly. A case control study

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The positional or deformational plagiocephaly is a nosological entity that in recent years has attracted increasing attention in both clinical and scientific field, due to an exponential increase in its prevalence in the population of newborns in the report, as it has now been clarified by numerous studies, the publication in 1992 of the guidelines of the American Academy of Pediatrics (AAP) [1] on the prevention of SIDS, which recommend the supine position during the sleep for all newborns. The malleability of the skull in the newborn may predispose to the onset (emergence) of a deformity caused by gravitational forces of pressure to which it is subjected if the forces are mainly concentrated in a single direction; it is a fact that, besides the tendency sometimes observed to brachycephaly in infants who sleep for most of the time in the supine position even during the day, any limitations of the cervical spine or simple "preferences" of position, as it is often observed, can lead to oblique asymmetries of the skull initially posterior of the occipit but which can then be transmitted to the temporal and frontal bones causing asymmetries of the facial [2] [3]. The Positional Plagiocephaly (PP) is a unilateral deformity of the skull of the newborn caused by prenatal or postnatal external forces acting on the skull still soft in the first months of life [4] [5] causing a unilateral occipital flattening, and in severe cases even misalignment of the ears on the axial plane and asymmetry of the face [5] [6].

Currently, the most recent studies, there was a prevalence in the population age-dependent with values between 6.1% and 13% at birth [7] [8] 16-22.1% in 6-7 weeks, 19.7% at 4 months, 9.2% at 8 months and 6.8% at 12 months. [9]. The etiology of PP is due to multiple factors acting from the earliest periods of life: prenatal, intrapartum and postnatal often concurrent with each other (Tab. I).

At present, several authors believe that there is a strong association between myogenic torticollis, positional preference and the onset of the PP [2]. It has been long time established that a stiff neck present at birth can subsequently lead to secondary cranial deformity. Stellwagen *et al.* have described the association between congenital torticollis, facial asymmetry and Plagiocephaly, concluding that children with torticollis, are more at risk of developing Positional Plagiocephaly. The purpose of this study was therefore to: provide a method for an accurate assessment of the asymmetries of the cervical ROM in the newborn. Evaluate the presence of risk factors for peripartum, intrapartum and postpartum. Determine the association between PP and alteration of cervical ROM. Evaluate, in a group of healthy infants not affected by plagiocephaly, the cervical ROM. Define the importance of an early screening of the newborn through an assessment of the cranial morphology and the cervical ROM.

MATERIALS AND METHODS

Our study is an observational case control study in which we have examined 19 infants aged between 2 and 8 months, who came consecutively with a diagnosis of PP, at the outpatient clinic of Physical Medicine and Rehabilitation between 2011 and 2012.

Were excluded from our study patients with synostotic plagiocephaly which was diagnosed with clinical and radiodiagnostic criteria [10].

A control group of 20 healthy children aged between 2 and 12 months were seen by two paediatricians. The entity of plagiocephaly was evaluated according to the Argenta's classification. Two doctors have performed the same maneuver evaluation of cervical ROM of the infant in the study group and the control group. The same maneuver was repeated in the two groups at a distance of 7-14 days. The medical examiners were trained to perform the maneuver with the same level of skill. Was made a careful history to identify possible risk factors and predisposing factors for PP: Restricted intrauterine environment (fetal constraint); first born, multiple pregnancies and space-occupying processes that determine uterine malformations and reduced mobility of the fetus who is forced to stand for long periods in the same position; persistence of the fetus in the same position in the last trimester of pregnancy (stuck baby); breech presentation; labor and prolonged dystocial birth; myogenic torticollis; hypotonia; prolonged hospitalization

Table I.—*Factors influencing PP etiology.*

Prenatal factors	Intrapartum factors	Postnatal factors
– Sex male	– Birth trauma	– Prematurity/hospitalization
– Firstborn	– Myogenic torticollis	– Prolonged supine position
– Breech / transverse presentation	– Fetal-pelvic disproportion	– Artificial feeding.
– congenital anomalies	– Complicated delivery (vacuum or forceps)	– Reduced motor activity
– oligohydramnios	– Prolonged second stage.	– Low maternal education
– Son of a diabetic mother		
– fetal hypomotility.		

in the neonatal intensive care unit; supine position during sleep (as the AAP raccomands); trauma from childbirth can be the result of using forceps or ventouse; premature birth.

On physical examination, the patients were examined in 4 positions:

— Front view: with the child held in the arms of the parent with his look straight ahead. In this position we can observe the asymmetry of the forehead and of the face.

— Top view: with the child sitting on the couch or in the arms of the examiner. The nose should be facing straight forward. The medical examiner puts his index finger at the level of the external auditory meatus of the child from both sides observing the patient from above. This allows medical to evaluate the asymmetry of the face, the posterior cranial asymmetry, the misalignment of the ears and the abnormal protrusion of the temporal cavities.

— Rear view: with the child sitting on the couch or in the arms of a family member. This position is used to confirm the malposition of the ears and the posterior cranial asymmetry.

Side view: directly with the child sitting on the couch or in the arms of a family member. Allows medical to observe any abnormality of vertical growth of the skull that may arise in the event of severe plagiocephaly (type V according to Argenta), when the brain tries to decompress hampered in growth [11]

On palpation we have examined: State of the fontanelles, status of the sutures of the skull, state of the neck muscles (particularly the sternocleidomastoid muscle), cervical ROM (active and passive rotation of the head and lateral passive flexion).

In assessing the mobility of the head (ROM) was adopted a "setting" to try and create calm condition of mind of the infant. We used a bed of Bobath large enough to facilitate the assessment. The infant was placed supine, and we observed the spontaneous attitude of the head. Subsequently, through the use of a colored object and sound, the subject has been stimulated to an active rotation of the head towards both sides, sometimes using the voice and the maternal face placed at the sides of the bed (fig. 1).

It is desired at this stage to fix the shoulder contralateral to the rotation of the head on the couch, to avoid compensation so that the active or passive rotation is highlighted objectively, taking as reference the baby's chin and the shoulder ipsilateral to the rotation, considering the difficulty of the infant to maintain the look on the object when it is placed on the side of limitation. It is important to assess any signs of stress in his expression / crying / active opposition to the forced rotation. Once induced the highest degree of active voluntary rotation or simply the maximum degree of spontaneous rotation, the head is held with manual gripping and

Figure 1.—Stimulation to active rotation.

Figure 2

gently forced the ROM to the maximum degree (accompanying then the spontaneous movement earlier evoked) (Fig. 2).

To assess lateral neck flexion, the infant's head were tilted ear to shoulder with gentle, steady pressure until resistance was appreciated.[11] the evaluation was carried out by placing the lateral inclination of the examiner's hand at the level of the neck of the child, having put at ease the infant is carried passive lateral inclination of the head that allows to assess the degree of retraction of the SCM as children with a muscle shortening tend to follow the movement of the head with the body.

The control group consisted of 20 healthy children aged between 2 and 12 (average age 4.5 and SD ± 1.95) months assessed by two paediatricians. They were evaluated with the same method of plagiocephalic patients.

In this way it was possible to observe a real limitation of ROM highlighting an altered balance of the musculature of the neck in particular SCM. It is important at this stage to assess the eventual opposition of the child to the maneuver on the side of the limitations, which often evokes active opposition and crying. To quantify the limitation in infants many studies have evaluated the cervical ROM as in adults. The healthy baby can turn his head well over the shoulder 100-110 ° with respect to the midline and can laterally flex the head of 50-60 ° to the shoulder. In our evaluation to quantify the limitation of both active and passive cervical rotation we considered clinical reference points numbered from 0 to 3:

— 0 Chin over the shoulder (100% of rotation): full ROM.

— 1 Chin at the shoulder (90% rotation): slight limitation

— 2 Chin that exceeds half clavicle but does not reach the shoulder (60% of rotation): moderate limitation

— 3 Chin that does not come in the middle (45°\30° of rotation): severe restriction.

RESULTS

We have noted that all the patients at the first observation showed a preferential position of the head and a limitation of cervical ROM of various degrees associated with the presence of positional plagiocephaly and torticollis. In the control group no child had these characteristics; changes in the passive cervical rotation were present in 73.68% of children in which 85.71% was mild, moderate in 14.28%. None had a serious limitation in cervical rotation (Fig. 3).

The 89.47% of patients had a limitation in active rotation, of which 82.35% mild, 11.76% moderate, 5.88% a severe limitation (Fig. 4).

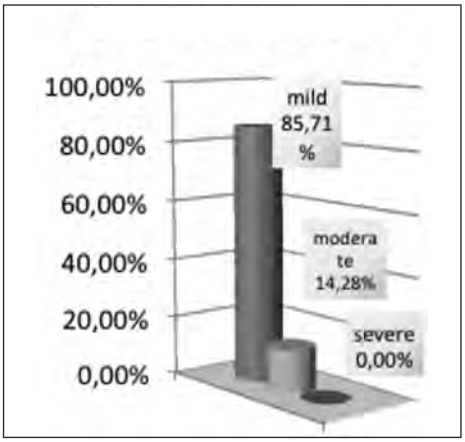

Figure 3.—Limitation of passive rotation.

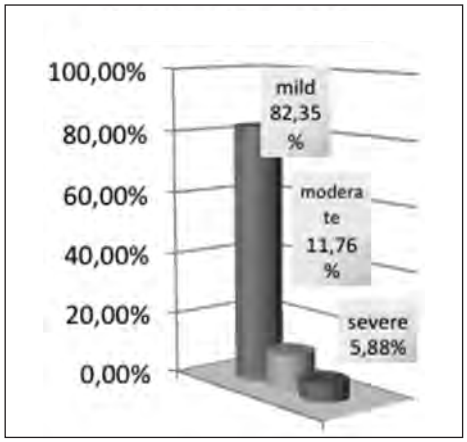

Figure 4.—Limitation of active rotation.

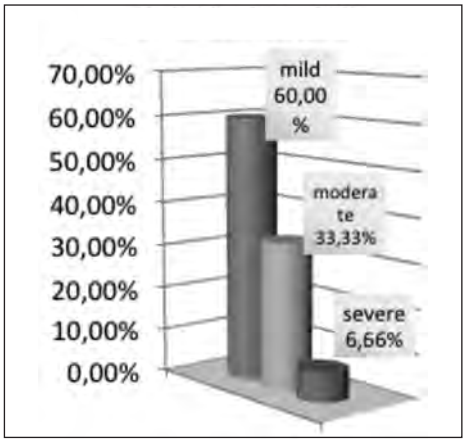

Figure 5.—Limitation of lateral tilt.

In addition a limitation in the passive lateral flexion was present in 84.21%, of which 60% mild; moderate 33.33% and 5.88% a severe limitation (Fig. 5).

The 73,68% had a limitation in the rotation associated with active and passive ROM. Only the 15.78% in active rotation was isolated and none had a limitation in the passive rotation.

No patient had a limitation of passive lateral flexion isolated; in all other cases was variably associated with limitations in the rotation.

Based on the classification of Argenta children with plagiocephaly were distributed as follows: 26.31% belonged to the class I, class II 15.78%, the 15.78% of the 26.31% class II to class IV and 15.78% of the class V. The PP was predominantly at the right side of the head (68.42%).

The multivariate statistical analysis was performed using Fisher's exact test, according to which p-values less than 0.005 were statistically significant.

DISCUSSION

With our study, we have developed a method for the manual assessment for accurate and repeatable that can assess the degree of limitation of the cervical ROM in a population who have PP and with myogenic torticollis.

However has long been established that the torticollis present at birth can lead secondary to cranial deformities. While the association between PP and abnormal cervical ROM is now recognized, but not yet well defined or at least universally accepted. In 2008, Stellwagen *et al.* have described the association between congenital torticollis, facial asymmetry and plagiocephaly, concluding that children with torticollis, are more at risk of developing positional plagiocephaly, especially sleeping on their back. In our study all patients showed muscular imbalance evaluated with cervical ROM assessment, associated with PP. In literature there are contradictory results about this (64% according Brunneteau *et al.* 1992, 20% Losee J *et al.*2007, 12% Golden *et al.*1999); according to our experience, in literature the percentages of the association of myogenic torticollis, or more generically called "neck problems" and PP, are undervalued and it would seem to be attributed, as reported by bialocerkowsky in 2008, to the fact that the evaluation of the ROM is always carried out with different and not well defined methods.

The limitations of our study depend on the fact that the sample is stratified in an age range between 2 and 12 months; patients were evaluated consecutively by two doctors in the same areas; our sample consisted of a few patients.

CONCLUSIONS

The maneuver proposed by us was valid and repeatable in order to assess the association between PP and myogenic torticollis; is useful in order to have a more reliable result to repeat the maneuver interoperator in separated areas. Implementing a screening of cervical function in infants with positional preference could be useful in the prevention of PP.

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Assessment of the modification of scoliotic curves in bending, prone and extention postures through scoliometer (84 cases)

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Scoliosis is usually assessed in upright position (both clinically and radiologically) and in flexion (forward bending), especially to research humps that cannot be corrected by rotating, side bending, etc. Scoliometer can also be used to test, with a less subjective method, the magnitude of the curve and its evolution over time. A dynamic assessment is difficult to be conducted to see the modifiability of the curves in various positions. For a long time we have noted that scoliotic curves have frequently tended to change, even significantly, over various degrees of flexion-extension; especially the bending tends to aggravate the hump, in most cases. Therefore, we decided to assess the change through scoliometer, in order to have a qualitative and quantitative comparison over the impact of such variation. For us, this is important both to investigate causes and contributory causes that lead to scoliosis, and to delineate a rational and effective therapy.

PATIENTS AND STUDY METHOD

84 scoliotic patients were assessed in the U.O. of R.R.F of Feltre (BL) in the year 2012.

Inclusion criteria: scoliosis with complete rachis' radiography in upright position with scoliotic curve of at least > 10° Cobb.

Exclusion criteria: low back pain – lumbo cruralgie – lumbosciatica of various kinds; major spinal disc herniation; spinal tumors, rheumatic diseases, outcomes of spinal stabilization, of operations for disc herniation, stenosis, scoliosis, spinal fractures etc, neurological diseases, acute internistics, recent spinal manipulative therapies etc.

— Considering: 1) sex, 2) age, 3) type of scoliosis (lumbar scoliosis (L); dorsal (D); double curve [L left and D right, and L right and D left; (the cervical spine was omitted as the assessment would have been complicated)]. 4) Cobb degrees of the curve/s, 5) index-to-ground distance. Scoliometer was used to test the degrees at the apex of the curve/s in the following positions: 6) bending, 7) prone, 8) extension; 9) variation of humps (<,>) in the different positions, 10) conducted treatments (corsets, kinesitherapy, etc.)

— Clinically, the 5) the index-to-ground distance was assessed with the patient naked and in barefoot, with the feet in physiologic opening. (ie, with folded hands and knees extended, the patient was asked to approach the floor, as much as possible, without forcing).

Scoliometer was used to test the degrees at the apex of the curve/s in the following positions: 6) in flexion (forward bending in the same position as previously described); 7) in prone position (with the nose just out of bed to avoid rotations of the head potentially conditioning the scoliosis); 8) in extension (with elbows leant on the table and with vertical humerus, to induce a spine extension). 9) It was examined whether the humps varied in the different positions and in what positions they improved or worsened. The 10) conducted treatments (corsets, kinesitherapy, etc.) were reported too.

RESULTS

1) 84 (17 m, 67 f) scoliotic patients were assessed by 3 physicians, in the U.O. of R.R.F of Feltre (BL) in the year 2012.

2) Age: 7-80 years. Average age = 19.8 years (f = 20.5, m = 18.4). 3) 33 had lumbar scoliosis (L) (21 left, 12 right), 5 dorsal (D) right, 46 had double curve (37 L left and D right, and 9 L right and D left). 4) Cobb: the average value of total lumbar curves (79) is = 19.4°; the average value of total dorsal curves (51) is = 16.4 °. 5) The average index-ground distance = 16.3 cm.

99 curves in total (59 lumbar, 40 dorsal) increased (>) to the Scoliometer in bending, compared to prone position; 18 (12L; 6D) diminished (<); 13 (8L; 5D) were equal.

96 (70L, 26D) curves > in bending compared to the extended position; 11 (3L; 8D) <; 23 (6L, 17D) were equal.

Table

	>	<	=
BENDING compared to **PRONE**	**99** (59L,40D9)	**18** (12L; 6D)	**13** (8L; 5D)
BENDING vs EXTENTION	**96** (70L, 26D)	**11** (3L; 8D)	**23** (6L, 17D)
EXTENTION vs PRONE	**58** (44L, 14D)	**16** (5L;11D)	**56** (30L;26D)
	FLEXION	PRONE	EXTENTION
AVERAGE values of total LUMBAR curves (SCOLIOMETER)	7	4,7	3,9
AVERAGE values of total DORSAL curves (SCOLIOMETER)	6,2	4,1	3,9

58 (44L, 14D) curves < in extension compared to prone; 16 (5L; 11D)>; 56 (30L; 26D) were equal.

Scoliometer: average values of total lumbar curves: 7 in bending, 4.7 prone and 3.9 in extension. Average values of total dorsal curves: 6.2 in bending, 4.1 prone, 3.9 in extension.

10) 38 cases were wearing or had worn corset. 57 were performing or had performed kinesitherapy for scoliosis.

CONSIDERATIONS AND CONCLUSIONS

By Bunnel P.W. [1] the use of scoliometer to measure the angle of rotation of the trunk justifies a radiography of the spine at 5 °.

Korovessis P.G. *et al.* [2] urge all physicians engaged in scoliosis screening programs, to use scoliometer along with mathematical formulas developed by the authors to estimate the Cobb angle.

For Sapkas G, Papagelopulos A. *et al.* [3] The data emerged from the scoliometer combined with the three mathematical formulas enable the assessment of idiopathic scoliosis of adolescents and the follow up for the evolution of this deformity. They recommend this method for the follow up, as it is easy to use, cost-efficient, sensible, reliable and allows the avoidance of non-necessary spine radiographies.

For Bunnell W.P. [4] A patient with a back rotation angle of 5° or less, detected through the use of scoliometer, should be discharged without being subjected to a re-screening, with a reasonable certainty that a significant scoliosis is not present and it has no probability to emerge. Patients with dorsal rotation angle exceeding 10° should be immediately sent to a medical assessment as well as to a radiographic examination. Patients with dorsal rotation angle between 5 °-9 ° should undergo re-screening every six months and up to one year after menarche.

By Huang S.C.[5]"Our data show that the inclinometer measures reduce the need for radiographs in patients with minor trunk asymmetries identified through screening spinal programs".

By Yawn B.P. *et al.*[6] The effectiveness of a program for scoliosis screening was determined.

Manual evaluation of Lisa R. Chun in [7] is similar to our one.

From the reported data, it is evident that many humps tend to increase in bending and to diminish in neutral position as well as in extension. There is no significant difference between extension and neutral position, while the bending position seems to influence the curves quite a lot. For us, it is an important parameter, considering that during the day a person does not always remain in a neutral position, but stresses the column in various degrees of flexion-extension. In particular, this worsening direction is constantly stressed and can potentially be cause and contributing cause in the evolution of scoliosis.

It's important to investigate the mechanism that causes this aggravation. In a normal spine (without the anatomical deformation of bones and joints of the scoliotic vertebrae), this situation is described as an asymmetry of flexion of one (or more) vertebrae.

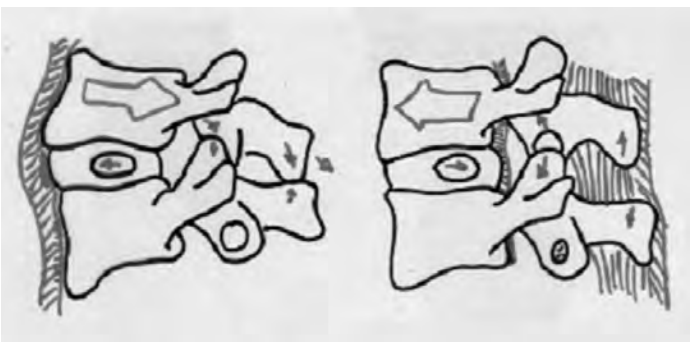

Figure 1.—Vertebral flexion-extension.

The back articular apophyses, on the convexity side, are free (or freer compared to the concavity side) to diverge, while the joints of the concavity side are blocked (or stiffer) in convergence and fail to perform the bending (divergence). This bring us again into the same, old problem: what can block a joint? According to Maigne R., [8] there are small menisci that, if dysfunctional, may limit the range of motion. In our opinion, the most likely hypothesis are the following: 1) contractures, proportional muscle hypo-hipertonia (especially of the spine's intrinsic muscles), 2) myofascial, ligamentous asymmetric retractions, etc.

1) An asymmetrical muscle tone (proportional hypertonia on one side and/or hypotonia on the other), can induce or sustain scoliosis. The persistence of muscle asymmetries, over time can be fixed in the connective tissue, which, if not stretched systematically, tends to shrink and give fascial asymmetries. 2) For us, it is very likely that myofascial tensions-retractions are greater in the concave side. These are likely to affect and limit the vertebral motion. The piezoelectric effect tends to fix this asymmetry in the bones and in the joints. This could be the beginning or the evolution of a scoliosis, and justifies, among other things, decompensated techniques of global elongation etc.

By Parent S. *et al.*[9]. The vertebral wedging is an important feature of the vertebrae in scoliotic rachides. It occurs mainly at the apex of the scoliotic curves and it is maximum at a frontal level. The point of inflection may be found on the convexity rather than on the concavity. The authors believe that scoliotic deformity is not the result of an isolated disturbance of the growth on the sagittal plane, but instead a combination of a sagittal and coronal deformity, which increases the loads on the growth plates in a progressive mode.

For Stokes A.F. *et al.*[10] The progression of the scoliotic deformity during growth is thought to be associated with an unbalanced load of the spine that produces an asymmetric growth. It is possible to assume that several cases suffering from scoliosis adopt different strategies of muscular activation and that some of them provide a vertebral load, able to determine the progression of deformity during growth, while others do not make it. Muscular strategies that appear to protect the spine by the loads that would probably cause a progression of the deformity require a greater level of muscular activation, including the antagonist activation with physiological costs associated with an increased consumption of muscle energy as well as total vertebral load.

For Stokes A.F.[11] An important difference between progressive and non-progressive scoliosis may be found in the different muscular activation strategies chosen by different individuals, that can lead to both a better prognosis and less invasive conservative operations.

For Mooney V *et al.* [12] A factor that may be relevant for the treatment of idiopathic scoliosis is the evidence of muscle asymmetry associated with the curve. The asymmetry was noted in both histological and histochemical studies. All studies seem to support a predominance of type I fibers on the convexity. An asymmetric myoelectric activity was noted on the convex and the concave sides. The convex side seems to be more hyperactive. The area of the lumbar multifidus was found to be wider on the opposite side of the lumbar curve's convexity and on the concave side on the lumbar and dorso-lumbar curves. The muscle imbalance can be corrected with exercises that isolate the appropriate muscles.

It's important to describe briefly the main muscles-fasciae involved and make brief remarks.

SELF-ELONGATION

To take place, it requires the active contraction of muscle fibers that perform it as well as the relaxation of those that oppose it. In

almost all individuals, the structures that oppose this strain are not in a state of optimal elasticity, pliability and length, but are almost always shortened, with trigger points and often with established fibrotic retractions. Flexion stretches, causing the elongation of many structures that work in chains; thus they progressively affect the motility of the joints they hold. It is necessary to briefly mention the myofascial structures that hinder the elongation and are stretched, tensioned by bending**.**

Muscles to relax and progressively elongate

According to some schools of thought (with which we fully agree), muscles do not work individually but united as to form "chains". If a segment of a chain is a site of retraction or shortening, the whole chain may be affected and the disease may involve districts far off. It is thus important to stretch all the involved myofascial structures by keeping them globally in tension, elongation. Some (eg Mezieres, Ph. Souchard [13-19]) have particularly emphasized the importance of the retraction of the posterior chains, which tend to increase and maintain all the curves of the spine and body (only lordosises). Currently, we tend to consider and treat even the other chains [20-27] (they slightly differ among the various authors).

A good elongation is impossible without the fact that these muscles grant the necessary length to enable it. Therefore they have to be stretched, elongated. It is now worth mentioning the opinion of Cittone JM [28] on this regard. For him, the posterior chain, from top to bottom, includes:

1) **Neck muscles**, organized into 4 levels:

A) Deep level (including mostlty the suboccipital muscles): major and minor rectus capitis posterior, superior and inferior oblique, and interspinalis, trasversospinalis, intertrasversarii.

B) Complexus level: major and minor complexus, longissimus cervicis and cervical part of the sacrospinalis.

C) Level of the splenius capitis and cervicis and of the levator scapulae.

D) Superficial level: trapezium and superficial plane of SCOM.

2) **Posterior muscles of the trunk**, arranged in 3 groups:

A)The back group:

a) Level of spinouses: trasversospinalis, iliocostocervicalis, longissimus thoracis and spinalis thoracis.

b) Plan of serratus posterior superior and inferior.

c) Plan of the rhomboid.

d) Floor surface: trapezius and latissimus dorsi.

B) Group average: quadratus lumborum and intertransversarii.

C) Front Group: psoas and iliacus.

The diaphragm, with its back insertions, weaved with those of the psoas, fixes lordosis.

Ligaments of the spine

Even these structures that limit the passive excursion of the joints, in our opinion, do not work alone but mainly by forming "inextensible columns (by joining in series)", that go (not all completely) from the coccyx to the occiput. The posterior longitudinal ligament, the anterior longitudinal ligament, the yellow ligaments, the intertransversarii, the ligaments which constitute and reinforce the capsule, the interspinouses, the sovraspinouses, the vertebrocostal ligaments etc. do not act in isolation but influence each other, as segments of chains.

An asymmetry, a retraction, a disharmonic length of some of them (usually associated with an asymmetry, inter alia, of the small intrinsic muscles of the spine), inevitably involves many near and far joints and can disrupt the structure of the whole column.

They influence the structure and dynamics of the intervertebral disc and thus the pressure that the nucleus pulposus exerts on the fibrous ring. It is "normal", because very frequent, that the mentioned ligaments and myofascial structures became shorter after traumas, diseases of internal organs, surgeries, wounds, even minor bone malformations, but especially from postural imbalances, although minimal. It should be noted that the bone structure is not fixed but it is constantly remodeling itself, for instance for the piezoelectric effect. It is also possible that these tensional asymmetries slightly alter the bone structure and this in turn influences the setting of the structures, thus starting up unbalanced loads on the adjacent and distant joints. Just by looking at the anatomy of the scoliotic vertebrae, many "idiopathic"scoliosises should be investigated. Much of the treatment and prevention shoulc be based on the mentioned principles.

The *dura mater*, inextensible membrane that moves (with almost no insertion on its way) from occiput-C1-C2 to S2, for many authors, eg. [29], is often subjected to constraints, retractions etc. that may affect the whole organism.

In our opinion, the small muscles of the spine, those of the deep plane (interspinalis, supraspinalis, intertrasversarii etc.) are of particular relevance. They include the trasversospinalis (multifidus) that is inserted as a fir tree, on the whole spine until the spinous process of C2. A transverso-spinalis goes from the transverse process of a vertebra up to the spinous processes of the above 4 vertebrae (the first beam goes to the front part of the lamina above, the second to the back part of the lamina of the second vertebra above; the third to the base of the spinous process of the third overlying vertebra and the forth to the back of the forth overlying spinous process). This muscle causes ipsilateral inclination (especially with lower beams) and contralateral rotation (especially with the higher beams) of the vertebrae above. At the same time, it limits the contralateral inclination and ipsilateral rotation of these vertebrae. Its contraction, trigger point, hyper-hypotonia and, above all, retraction (induced by postural, traumatic, inflammatory, visceral problems etc.), can induce scoliosis. If long-standing, it may stir up an important process of evolution.

— Given that most scoliosises affect the dorsal-lumbar spine, the iliocostocervicalis, the longissimus thoracis, the spinalis thoracis (the last 3 are joined and form the common lumbar ground), are probably involved in an important way in this asymmetry of strength, tone, length, retraction etc.

— The quadratus lomborum, with its fibers (ilio-costal, ilio-vertebral and vertebro-costal) probably plays a key role in influencing this evolution too.

— The diaphragm that draws forward up (and does a tilt towards the extension) the vertebrae from T12 to L3 (on the contrary of the spinalis thoracis, that attracts high-back and tilt it toward the bending), is probably important in this asymmetry.

— Even the ilio-psoas, powerful muscle that inserts on the transverse processes, the disks and lateral part of vertebral bodies from D12 to the sacrum is involved, also for its action on the pelvis. The fact that generally the curves tend to worsen in bending (this relaxes the ileo-psoas) and to reduced in neutral position and extension (which bring this muscle into tension), indicate that the retraction of this structure is not very important in influencing such pathology.

— To be concise, we omit the discussion related to the other structures. The asymmetry of one of these muscles (which, over time will inevitably involve also other structures) is enough to induce or sustain a scoliosis (and it may be the primary cause).

CONCLUSIONS

For Ferraro C [30] The improvement of spine biomecanics resulting from exercise therapy may have a corrective effect on the growth.

Data along with the above considerations justify the treatments of decompensated global elongation. If the arc increases in length and the cord (myofascial and ligamentous) that tightens it, does not lengthen in proportion to it, the arc is then destined to progressively accentuate its curvature, aggravating the scoliosis. In our opinion, these stretches are frequently essential and more important than the tone gyms, the proprioceptive ones etc. Also the various types of corset probably act, among other things, by keeping the retracted structures elongated and urging their elongation. If there is retraction, it often needs to be associated with decompensated global elongation. Our thirty-three years of experience supports our opinion. Specific studies on this topic are likely to follow.

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Cognitive functions and presbyphagia

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Aging causes physiological and biological alterations that occur in the whole human organism. This inexorable change, influenced by genetic, environmental and social factors, also involves higher cortical functions (1) and the oro-pharyngo-laryngeal system which lead to presbyphagia.

It's also known that swallowing is constituted by a succession of precise and coordinated phases that cannot be leave aside from nervous regulation. In elderly subjects, cerebral atrophy and metabolic decrement in nerve structure compromise cognitive functions; impairments in higher cortical/nervous functions determine, in turn, an alteration of the entire process of swallowing, from planning to execution.

This study presents cognitive and swallowing functions evaluation and investigates the correlation between this two competences.

MATERIALS AND METHODS

In this work, 16 patients were involved (15 women and 1 man) whose age ranges from 69 to 97 (mean age 86.7), hospitalized at a nursing home. The sample was selected according to the following exclusion criteria: ENT diseases in place, oral dysfunction, GERD, thyroid diseases, spinal diseases, ventilatory disorders, obesity, diabetes, hypertension.

The sample was submitted to a screening for cognitive impairment with MMSE (Mini Mental State Examination) and MoCA (Montreal Cognitive Assessment), in order to detect even slight deterioration of cognitive functions (2).

Then the sample was submitted to a screening to swallowing disorders with Morpho-functional evaluation Protocol (Amitrano, derived from Cot and Desharnais), including taste sensitivity evaluation and feeding trials, sensitized with oxygen saturation monitoring (3-6), and the self-assessment of dysphagia MDADI (M.D. Anderson Dysphagia Inventory, italian translation and adaptation by Schindler and Gambino (7).

The feeding trials provided the administration of food in different consistency: liquid, with four glasses of water at room temperature (10ml and 60ml for two times each); semisolid, with two administrations of 10 g of pudding in fridge temperature; solid, with two doses of 5g of bread at room temperature.

3 of the 16 patients, including the only one male, decided not to undergo the assessment.

RESULTS

All the examined patients showed a cognitive impairment with different levels of gravity. Cognitive screening, performed with MMSE, reported that 62.5% of the sample presents mild or no cognitive impairment; the remaining 37.5% presents moderate to severe alterations. The same sample, submitted to MoCA test, presents deficits in all cognitive functions investigated (Figs. 1, 2).

About swallowing functions, the data obtained from the self-assessment of dysphagia indicate that no patients considered dysphagia as a severe disability.

However, the functional evaluation of dysphagia has detected the following data. The analysis of the swallowing reflex shows that 39% of patients maintains an unchanged functionality, 54% presents a swallow dysfunction and 7% shows a severe alteration (Fig. 3).

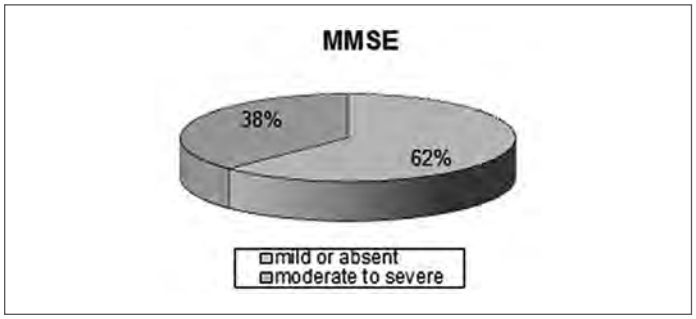

Figure 1.—Results at MMSE.

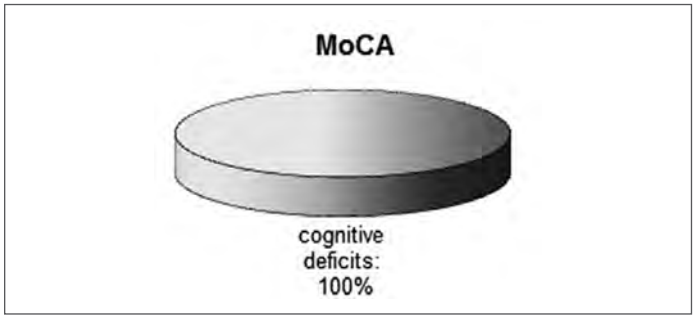

Figure 2.—Results at MoCA.

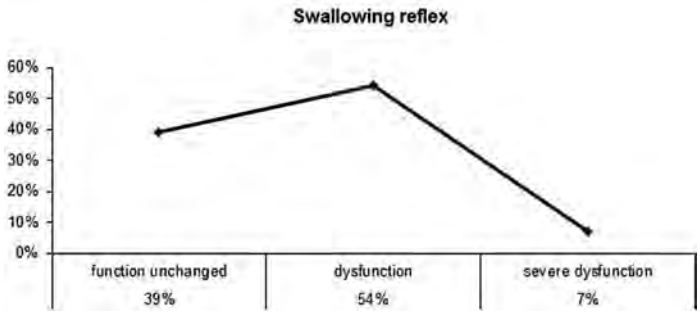

Figure 3.—Results of the evaluation of the swallowing reflex

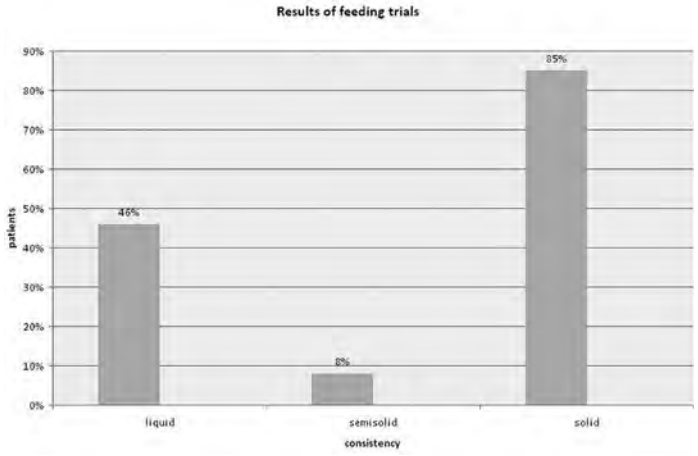

Figure 4.—Percentage of patients showing difficulties for various consistencies

Test for oral sensitivity shows a greater impairment against tongue and palate, with an alteration, from moderate to severe, respectively in 53% and 77% of the patients examined.

The analysis of feeding trials reports the following data. The entire sample is able to complete the test with 10 ml of liquid consistency, but only the 46% of patients manages to complete the trial with 60ml; the trial with semi-solid consistency was completed by 92% of the sample; with the solid consistency, only 15% succeeds in complete the test; the other patients present cough and/or raclage or rejection. The data obtained from oxygen saturation monitoring do not show significant falls in SPO2 values (Fig. 4).

In addition, the qualitative analysis shows a significant reduction of salivation in the 84% of the patients which can affect the efficacy of the oral mixing of the solid bolus, normally more dry then the other consistencies.

The data obtained, after an adequate score's standardization, were correlated with each other through Pearson correlation.

The correlation between the variables obtained (scores of the various tests) are shown below:

Amitrano's Protocol and MMSE: $\rho = + 0.599$; Amitrano's Protocol and MoCA: $\rho = + 0.599$; Amitrano's Protocol and Self assessment of dysphagia: $\rho = + 0.141$; Self assessment of dysphagia and MoCA: $\rho = + 0.157$; Self assessment of dysphagia and MMSE: $\rho = + 0.032$.

As shown, the correlations indexes are all positive. More significant values are those that relate the cognitive assessments (MMSE and MoCA) scores with Amitrano's Protocol scores, while there is less correlation between the results obtained from Self-assessment of dysphagia and cognitive tests administered.

DISCUSSION

The cognitive screening shows that in all subjects investigated there's an alteration of the higher cortical functions.

The morpho-functional evaluation of swallowing confirmed the data reported in medical literature (9), according to which the morpho-functional impairment affects the whole buccal district (motility of tongue, lips, palate, mandible), pharynx and larynx. The significant changes in tongue and soft palate sensitivity (superficial and deep, thermal and gustatory) justify the slowdown in the oral phase and the swallow ignition delay (9).

The data collected by the feeding trials, clarify the performance of the elderly patient swallowing and its features. It has been observed that the subjects, undergoing swallowing stress, in 60ml liquid trials show early signs of dysfunction (raclage/cough), which are not observed in the amount of 10 ml, probably due to a request for a repeated coordination. Significant it is to note that the semi-solid bolus was more appropriate and better accepted by almost all of the patients. The solid bolus, made of a dry consistency, highlighted all the affected components of the swallowing complex, so as not to allow the administration of the second stage of the test in the 78% of the sample for refusal.

Finally, the study of statistical correlation between cognitive and swallowing evaluation notes that the most significant correlation ($\rho = 0.599$) is that between the MMSE/MoCA scores and Amitrano's Protocol scores, and shows that the increase in cognitive impairment leads to an increase in swallowing dysfunction. On the contrary, the analysis of correlation between the results obtained by the self-assessment of dysphagia and cognitive assessment shows a very little correlation, due probably to the fact that elderly subjects are not aware of their difficulty in swallowing and not perceive how this dysfunction can affect the quality of life. In fact, no correspondence is found between the degree of dysphagia subjectively perceived and objectively detected.

CONCLUSIONS

The limitations of this study are certainly represented by the lack of an instrumental evaluation of swallowing due to inability to move the patients elsewhere. Another limitation is the type of sample examined, poorly numerous and homogeneous for sex (15 women and only 1 man). So the results derived from this work reflect the issues concerning only the female population and it would be interesting to continue and extend the study to a wide and balanced for sex sample, more representative of the general population.

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Screening of spinal deformities in the public schools of Florence on 4361 children

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Scoliosis is a common disease: almost 5-10% of the population is affected by this condition. The higher risk moment for progression is adolescence, during the puberal spurt (1-2). Idiopathic scoliosis is the most common type, accounting for approximately 80-90% of all scoliosis cases; therefore is impossible to apply an etiologic therapy. Unique possible treatment remains secondary prevention in order to avoid the progression of the spinal curve. This is the reason why the early detection of progressive scoliosis is very important in terms of treatment, to start a correct therapy with observation or bracing, and to reduce the cases which need surgery. School screenings for scoliosis have the aim to identificate scoliosis risk in adolescent people and to set a correct follow-up for them. The start of screening for scoliosis began in 1963 in Aitken, a little town of Minnesota (3). Unfortunately, in the USA there is a lack of national standards for scoliosis screening mechanisms, making collection of outcomes not very homogeneus (4, 5). School screening for scoliosis remain a subject of considerable controversy and debate (6, 7). Screening was reported to have a low positive predictive value (0,05 percent) (8). This data can be modified if the screening program is performed by trained personnel, so as to reduce the number of false positive and the health expenses. Regarding the methodology used for scoliosis screening there are no standards about: the sex and age range that should be screened, the instruments that should be used for measuring the gibbus (therefore the Bunnell scoliometer is widely considered the simpler and more reliable), the correct position of the patient during the Adams Forward Bending Test (FBT), the Angle of Trunk Rotation (ATR) over which a specialistic consultation and/or radiographical examination is recommended. The main data according to scoliosis screening shawn by the SOSORT Consensus Paper (9) were: parents satisfaction about the attention to their child's health, an improvement in scoliosis aetiology research, an improvement in outcomes. The current knowledge is that early detection of the disease and appropriate conservative treatment, change the natural history of idiopathic scoliosis. School screening can also concern spinal deformity in the sagittal plane as the thoracic hyperkyphosis. The purpose of this paper is to illustrate the results of a screening for scoliosis and hyperkyphosis.

MATERIALS AND METHODS

From November 2011 to June 2012, physicians from the Recovery and Rehabilitation Agency of University Hospital of Florence (4 postgraduate students and 1 spine specialist), in concert with Education Department, performed a spinal deformities screening in the Secondary Schools of the District of Florence. Before the screening started it was given to the parents an informative letter with the agreement request to visit the child, a pamphlet containing information about detection and treatment of scoliosis and hyperkyphosis and a screening form (in double copy), with a first part to fill by the family with information about: sport, myopia, orthodontic appliance, previous diagnosis of scoliosis, and for girls date of menarche. The screening was conducted once a week, in the gymnasium of every single school. During the 1st level screening, the postgraduate students investigated: ligamentous laxity (Beighton scale), asimmetry of waist triangle, trunk imbalance (using plumb-line from C7), leg lenght discrepancies (pelvic gibbus on Adams test), presence of gibbus, the measurement of ATR using Bunnell scoliometer, and a measuration of thoracic kyphosys (with inclinometer) and identification of those which could not be corrected. In case of limb etherometry the presence of gibbus was investigated with the Forward Bending Test in the sitting position. If there were no spinal deformities on the 1st level screening, adolescents were referred to the paediatrician for annual controls. The 2nd level screening was done in case of: gibbus > 5° Bunnell, gibbus ≥ 4° Bunnell with omolateral reduction of waist triangle, gibbus ≥ 4° Bunnell with omolateral trunk imbalance (in absence of leg lenght discrepancies), two or more gibbi, even if < 5° Bunnell and thoracic hyperkyphosis (> 40°) which could not be corrected. At second level screening the spine specialist confirmed all the precedent notes, measured the gibbus entity in millimeters (using level and rigid centimeter). He also planned a diagnostic-therapeutic procedure through the request of periodic specialistic controls (the frequency was choosen in relation to the severity of the spinal deformity and the maturity of the child) or the request of a radiographic exam (postero-anterior and lateral standing X-ray of the spine). At the end of the screening one copy of the screening sheet, with the result of the visit and the diagnostic-terapeutic indications was delivered to the parents.

RESULTS

4361 students were screened (2162 girls, 2199 boys) of an expected total of 5556. The mean age was 11,5 years (range 9-14). 3408 students practised sports, 961 (28,19%) of wich agonistic sports. 526 subject had myopia (12,06%) and 1088 (24,95%) had an orthodontic appliance. 243 (11,24%) girls, on a total of 2162, had menarche. In 477 cases (10,93%), there was a previous diagnosis of scoliosis. The mean value of Beighton scale for joint laxity was 1,97/9 points (range 0-9). 52 (1,19%) students had a leg lenght discrepancy ≥ 8 mm. The mean value for thoracic kyphosys was 34,38° (range 9°-60°). 1052 students had a thoracic hyperkyphosis

(> 40°); 1039 (98,76%) students had a curve that could be completely corrected, wherease 13 (0,1%) had a structured curve. In 11 cases was referred to a spine specialist's a control after 6 months and in only 2 cases was requested an X-ray exam. On the total amount of 4361 students screened, 3699 (84,81%) had no significant spinal deformities on the frontal plane (group 1). In this group the mean value of Beighton Scale was 1,92/9 points. In 649 cases (14,88%), excluding 13 cases of isolated hyperkyphosis discussed in the previous section, we found significant clinical signs of scoliosis. In particular 609 (13,96% of 4361) of the 649 students with a clinical diagnosis of scoliosis were referred to a spine specialist control examination after 6 months (group 2), wherease in 40 cases (0,92% of 4361) X-ray there were requested (group 3). The mean value of Beighton Scale was 2,18/9 points for "group 2" and 2,91/9 points for group three. From "group 1" to "group 3" we found a score growth in Beighton Scale correlate to the increased severity of the spinal deformities. These data resulted statistically significant (Pearson's Chi-squared P<0,0001). In the "group 2" there were 185 boys (30,37%) and 424 girls (69,63%). 293 subjects had a single gibbus > 5mm or multiple gibbi, at least one > 5mm. 316 subjects were included in this group even with a gibbus < 5mm because of: presence of 2-3 gibbi in 81 cases (13,30% of group 2), presence of one gibbus associated with omolateral trunk imbalance in 226 cases (37,11% of group 2), presence of 2-3 gibbi associated with trunk imbalance in 9 cases (1,47% of group 2). In the group 3, on a total of 40 students, 7 (17,52%) were boys and 33 (82,48%) were girls; 35 subject had a single gibbus > 7mm, or multiple gibbi, at least one > 7mm. 5 subject were included in this group even with a gibbus < 7 mm because of: presence of 2-3 gibbi in 2 cases (5 % of group 3), presence of one gibbus with omolateral trunk imbalance in 2 cases (5% of group 3), presence of 2-3 gibbi with associated with trunk imbalance in 1 case (2,50% of group 3). Finally we have divided all the 4361 students into two groups: group "previous diagnosis", and group "not previous diagnosis". Group "previous diagnosis" (477 subjects): scoliosis was really present in only 108 cases (22,64%). In the remaining 369 subjects (77,36%) we found: no spinal deformities in 268 subjects (72,85%), leg lenght discrepancies (of any entity) in 44 subjects (11,95%), non significant gibbus (< 2 mm) in 53 subjects (14,4%), leg lenght discrepancies associated with non significant gibbus in 4 subjects (0,8%). In the group "not previous diagnosis" (3884 subjects) we found clinical signs of scoliosis in 541 students (13,92%).

DISCUSSION

Our results show a statistically significant correlation between the increasing severity of spinal deformities on the frontal plane and the increasing score of Beighton scale for joint laxity (Pearson's Chi-squared P < 0,0001). These data confirm the association between scoliosis and joint laxity, frequently quoted in literature (10). Differently from the common practice, in wich specialistic evaluation is performed during ambulatory follow-up, we also performed the second level screening in school, so as to reduce costs. As regards the cut-off for referring to the spine specialist, because of the second level screening was performed in the same session, our staff reduced the threshold at 5° ATR. The expected false positive caused by the threshold decreasing was reduced by the fact that subjects with ATR > 5° were immediatly examinated by the spine specialist. The increase in costs is caused by the high number of false positive, with over-referral and abuse of X-ray requests. However, this situation could be solved by training the screening performers. During the screening we found in many cases (541), clinical scoliosis has never been reported before, by pediatrician, sports doctors, others (false negatives); we also confirmed only in 108 cases, on a total of 477 the previous diagnosis (false positive). Therefore we found 910 diagnostic errors (20,86% of the screening population). The identification of these false-positives and false-negatives will allow us to early treat the patients and to reduce costs caused by the over-referral of false-positives.

The results we obtained during the second year of screening are quite equal to the results of the first year of screening (carried out according to the same criteria, from November 2010 to June 2011); this supports our implementation methodology of screening.

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Evaluation scales and measures in cancer rehabilitation

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The main aim of Cancer Rehabilitation is to obtain and save the best Health Related Quality of Life (HRQoL) (1) through all different ways which are necessary to restore structures, to improve functioning and to reduce activity limitation and participation restriction according to the International Classification of Functioning Disability and Health (ICF) (2) by WHO. The Quality of Life is a multidimensional concept, depending on several aspects such as health, economical status, culture level, social and family environment and Health Related Quality of Life (HRQoL) is all the aspects of a person's life depending on his/her health. In cancer patients unsatisfying HRQoL and disability could depend on the cancer itself and on treatments which often are disabling themselves. In Cancer Rehabilitation the assessment process has a great importance to evaluate the patient's condition and the efficacy of treatments. The aim of our literature review is to identify an evaluation scales and measure instruments (3) basic set for cancer patient rehabilitation assessment including Quality of Life questionnaires, impairments (functions/structures alterations) measures and disability (activity limitation and participation restriction) scales.

MATERIALS AND METHODS

In May 2012 we performed a literature review using the data base Pubmed and consulting essays and guidelines to identify the most used and well assessed measure instruments and evaluation scales in Cancer Rehabilitation (3,4). We considered only reviews and original articles from 2000 to April 2012 and the original references of the most used tools. The second step was to make a list of the most validated scales and measure instruments and finally, to provide more easy the choise, we have distinguished them into three groups: 1) Impairments scales and outcome measures; 2) Disability scales as generic measures or specific cancer measure 3) Quality of Life instruments as generic or specific (Table I).

RESULTS

Among impairments pain and fatigue are assessed using several instruments as intensity rating scales (verbal scales/ number scales/ visual analogue scales) or multi-dimensional questionnaires as the Brief Pain Inventory or the Mc Gill Pain Questionnaire (5); range of motion, muscle strength, dyspnea and others are assessed by common instruments. Apart from generic disability scales normally used (FIM,Barthel *et al.*), there are specific tools to assess cancer disability: both Karnofsky Performance Scale Index and Eastern Cooperative Oncology Group (ECOG) Score assess prognosis, daily activities, and clinical effectiveness of therapies (6,7). They classify patients according to their signs or symptoms of disease, required assistance, need of hospital admission and perspective of death: the Karnofsky Index ranges from 0 (death) to 100 (normal activities and the absence of clinical signs and/or symptoms) while the ECOG Score, also called Zubrod Score, ranges in opposite way from 0 (normal status) to 5 (death) (4). About HRQoL assessment the Medical Outcomes Study 36-Item Short- Form Health Survay is the gold standard among the generic measures (8). This self-administred instrument and its shorter form SF-12 investigates function and emotional domains, including pain and well being, and all scores are summarized into two composite scores, the Physical Component and the Mental Component Summary Scale Scores. A specific cancer HRQoL measure has been developed by European Organization for Research and Treatment of Cancer (EORTC) that offers a general multidimensional 30- item self-administred questionnaire, the QLQ-C30, and several cancer specific questionnaires to use in addition to the core questionnaire

Table I.—*Evaluation scales and measures in cancer rehabilitation.*

Impairments scales and measure instruments focused to clinical conditions such as Range of Motion, Muscle Strength, Pain and others
1. Disability scales
   - generic measures, non specific for disease or population, such as Functional Indipendent Measure, that offers the advantage to be used widely
   - specific measure
     a. more sensitive for specific conditions or illness, such as Karnofsky Performance Scale and ECOG Score in malignancy
     b. focused on a specific body region, such as the Disability of Arm,Shoulder and Hand Questionnaire (DASH) or the Neck Disability Index
2. Quality of Life scales and questionnaires
   - generic scales, non specific for disease or population, such as the Medical Outcomes Study 36-Item Short-Form Health Survay and the utility (or preference-based) measure such as the European Quality of Life Questionnaire
   - specific Measure developed for specific population or conditions such as FACT and EORTC questionnaires for cancer patients

C30(9). Another cancer patients QoL measure is the Functional Assessment of Cancer Therapy General scale (FACT-G) and its related cancer/symptoms/treatment specific measures (10). Both these measure systems are copyrighted.

DISCUSSION

Among impairments pain is one of the most important function to evaluate and we can't imagine a complete assessment of cancer patients without having attention to pain related issues. In clinical practice It is more simple to use numerical or verbal scales or visual analogue scale but multidimentional questionnaires allows us to better understand pain different characteristics. Regarding cancer disability scales, both Karnofsky Index and ECOG score are still used although current trend is towards greater use of ECOG score. Regarding the HRQoL generic questionnaires the SF- 36 enable comparison of results between general population and cancer generation while cancer-specific questionnaire are focused on specific cancer issues /symptoms or side effects of treatment. EORTC C30 and FACT-G are both available in a large number of language traslations and are similar for psychometric properties but EORTC QOL C-30 are more focused on functioning and activity while FACT-G on social support and relationships. Furthermore ICF offers a new approach to evaluate aspects regarding health of cancer people and there are specific core sets for breast cancer and head & neck cancer (11,12).

CONCLUSIONS

Hence, in clinical practice for a global evaluation of cancer patients we suggest to use a cancer specific HRQoL questionnaire (such as EORTC C30 and modules) in addition to a cancer specific disability score and a set of impairments and disability measures focused to the most relevant patient issues. Over these ICF has recomned to be performed.

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Sjögren-Larsson syndrome: a case report

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Sjögren-Larsson syndrome (SLS) is a clinically distinct syndrome characterized by congenital ichthyosis, mental retardation and spastic diplegia or tetraplegia. In 1957 Sjögren and Larsson first reported a series of 28 patients, most of whom from an isolated region of Northern Sweden, and established the autossomal recessive inheritance of the disease (1). Subsequent patients of non-Swedish ancestry were identified in other geographic and ethnic populations around the world (2). In Västerbotten county, Sweden (where SLS was first identified), the prevalence of SLS was 8.3 per 100000, perhaps due to inbreeding. The overall prevalence in Sweden was 0.4 per 100000 (3).

SLS is caused by a deficiency of the enzyme fatty aldehyde dehydrogenase (FALDH), an enzyme required to the oxidation of fatty alcohols to fatty acids (4). Mutations in the FALDH (ALDH3A2) gene on chromosome 17p11.2 cause this syndrome. Distinct mutations in the FALDH gene can lead to the phenotype of SLS (5).

The probable mechanism of cutaneous and neurologic disease in SLS is lipid accumulation (6) (7). In the skin occurs an accumulation of fatty alcohols, disrupting the epidermal water barrier, and resulting in transepidermal water loss and ichthyosis (4). The deficiency of FALDH also affects the metabolism of leukotriene B4, probably responsible for the severe pruritus that is characteristic of the disease (8). The precise mechanism of neurologic disease in SLS is not certain the deficiency of fatty alcohol oxidation may impair the structural and/or functional integrity of myelin membranes in the central nervous system, leading to the neurologic features, including leukoencephalopathy (7).

SLS includes the following clinical features: ichthyosis and pruritus, spastic diplegia or tetraplegia, mental retardation, ocular abnormalities and leukoencephalopathy (9).

Children with SLS are often born prematurely (10). Most of the clinical symptoms of SLS are evident in the first years of life and neurological involvement is apparently nonprogressive (9) (11). The degree of ichthyosis varies independently of cerebral symptoms (10). Phenotypic heterogeneity is present in individual families affected by SLS (11).

The cutaneous symptoms in SLS are usually present at birth and become more pronounced with time. Hyperkeratosis has a generalized distribution but tends to spare the face, lichenification is often seen in the flexures of the arms and legs. Pruritus is a common complaint (12) distinguishing SLS from other cornification disorders (13).

Neurological symptoms and signs, including pyramidal signs, usually develop in the first two years of life. Lower limbs are usually more severely affected than upper limbs (6). Most children become wheelchair dependent during late childhood or early adolescence, and joint contractures frequently develop in the legs (9). Most patients suffer from moderate cognitive impairment. Almost all patients suffer from a mild-to-moderate (pseudobulbar) dysarthria, which influences speech audibility and, together with a delay in language development, affects their already poor communicative functioning in daily life (13). Brain Magnetic Resonance Imaging (MRI) shows delay of myelination, periventricular signal abnormalities of white matter and mild ventricular enlargement (9).

Ophtalmologic findings as retinal crystals, which appear as foveal and perifoveal glistening white dots, may be present in patients with SLS beginning in early childhood (14) (15).

SLS is diagnosed by demonstrating the enzyme deficiency in cultured skin fibroblasts or leukocytes or by mutation analysis of the FALDH gene (16). The aim of this article is to describe a patient with this rare condition.

MATERIALS AND METHODS

The authors report a case of SLS in a 5-year-old female, SS.

RESULTS

SS is the only child from a couple with no relevant medical history other than family history of inbreeding (paternal and maternal grandmothers are first degree cousins).

SS was born prematurely, at 35 weeks of gestational age, no complications were registered during labour and delivery. Erythema, ichthyosis and pruritus were present from birth. The scales acquired a brownish discolouration around 6 months of age. SS first acquired sitting balance at 7 months of age and started walking at 21 months with frequent fall episodes.

SS was first referred to our hospital at 30 months of age. Spastic diplegia and global developmental delay were registered. A MRI study was made and showed delayed myelination. Knee skin biopsy showed arthrokeratosic compact hyperkeratosis and papillomatosis with perivascular lymphocytic infiltrate.

At 34 months of age, SS was diagnosed with SLS, after a genetic study showed a mutation in homozigoty in exon 6 of FALDH gene, not described in the literature at the time of diagnosis.

Since then the patient has had special education at school and has undergone physical therapy and speech and language therapy regularly. Dermatologic treatment with keratolytic agents and skin hydration measures have been administered since birth.

SS was first evaluated by Physical and Rehabilitation Medicine in our hospital at 5 years of age during a group consultation with Pediatric Orthopedics. On physical examination, SS appeared to

understand most commands but had a limited range of vocabulary. The child presented with severe ichthyosis and pruritus. There was a noticeable bilateral spasticity (Ashworth Modified Scale 3) on the adductors muscles of the tight, hamstrings and triceps surae; osteotendinous hyperreflexia; nonsustained clonus of the ankle and equinus gait.

Botulinum toxin injection was proposed as part of the rehabilitation plan and accepted by her parents. Intramuscular botulinum toxin type A was injected in the affected muscles and intensification of physical therapy was recommended. One and a half months after infiltration, there was an overall improvement in the patient's condition with decreasead spasticity (Ashworth Modified Scale 2) and gait pattern improvement.

DISCUSSION AND CONCLUSIONS

SLS is a rare disorder and although there is no cure, most patients survive until adulthood (16). Therefore a broad range of interventions is usually required in order to control symptoms and improve quality of life. Spasticity treatment in individuals with SLS has been attempted with baclofen but with no encouraging results. Botulinum toxin injections have been used in several patients with Sjögren-Larsson syndrome, however results indicate only a limited favorable response (17). These patients benefit from a multidisciplinary approach in which Physical and Rehabilitation Medicine plays a key role coordenating speech and language therapy, occupacional therapy, physical therapy, techniques such as botulinum toxin intramuscular injection and family counseling and support.

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Trattamento infiltrativo e riabilitativo nella coxartrosi: risultati a lungo termine

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L'artrosi dell'anca o coxartrosi, è una **malattia cronico-degenerativa,** caratterizzata dal deterioramento della cartilagine e delle strutture articolari. Interessa soggetti di età compresa tra i 55 e i 65 anni e predilige il sesso maschile; può essere primitiva o secondaria. **I fattori di rischio vengono classificati in modificabili (obesità, fratture, lussazioni, etc) e non modificabili (età, sesso e razza).** Il paziente affetto da coxartrosi presenta un dolore tipico, localizzato in sede inguinale e talvolta in sede glutea, spesso irradiato lungo la faccia anteriore della coscia fino al ginocchio. Poiché l'origine del dolore è essenzialmente meccanica, questo è provocato dal movimento articolare e dalla deambulazione, mentre viene alleviato dal riposo. Il soggetto riferisce rigidità mattutina e limitazione funzionale, solitamente di breve durata, associata ad impaccio motorio, cedimento e/o insicurezza. L'evoluzione ingravescente della malattia porta solitamente a modifiche dell'assetto posturale e dello schema del passo. Le caratteristiche semeiologiche sono ponderate e quantificate tramite scale di valutazione che uniscono i risultati di un'accurata anamnesi ad un corretto esame obiettivo. La conferma diagnostica e la sua classificazione sono essenzialmente radiologiche; la gravità viene valutata secondo la classificazione di Kellgren – Lawrence.

La Risonanza Magnetica Nucleare, in casi particolarmente selezionati, permette di individuare eventuali sofferenze dell'osso. L'ecografia è una metodica scarsamente utilizzata; consente di valutare la presenza di un versamento intrarticolare e risulta indispensabile nella terapia infiltrativa (Figg. 1 e 2).

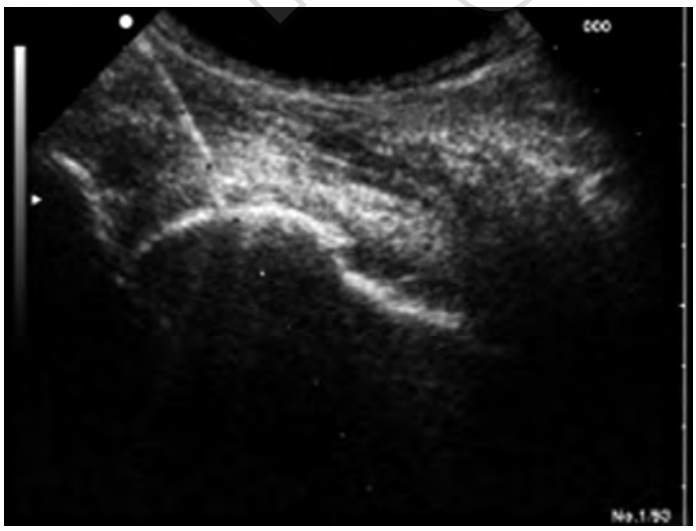


Figura 1. — Ecografia.

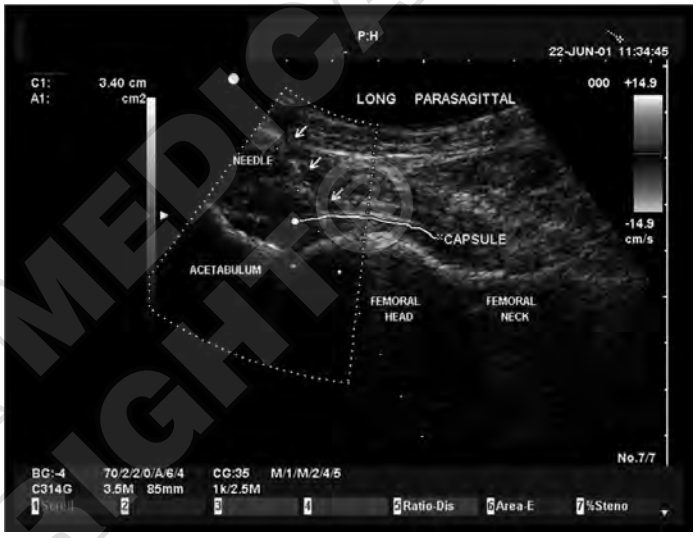


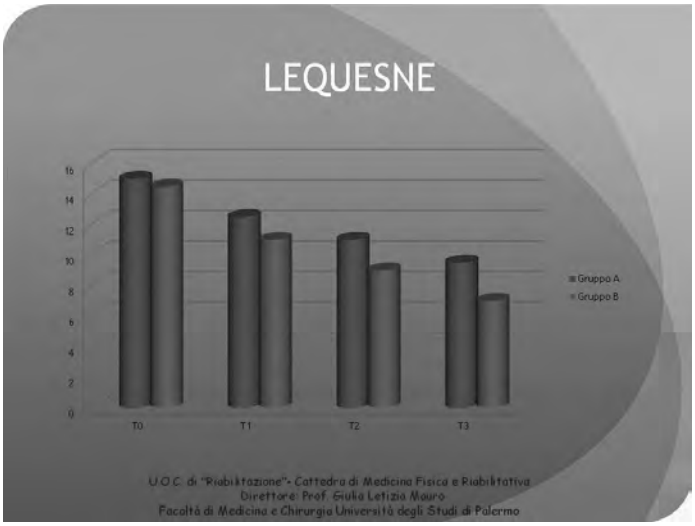
Figura 2. — Ecografia.

La riduzione del dolore e il recupero della funzione articolare rimangono gli obiettivi primari del trattamento attraverso una combinazione tra terapia medica e approccio non farmacologico. Da annoverare oltre al trattamento riabilitativo, la terapia infiltrativa ecoguidata con acido ialuronico, che favorisce la riparazione articolare con azione sulla crescita e sul metabolismo dei condrociti.

MATERIALI E METODI

Presso l'U.O.C. di "Medicina Fisica e Riabilitativa" dell'A.O.U.P. "P. Giaccone"di Palermo sono afferiti, tra Febbraio 2008 e Giugno 2012, 313 pazienti (36 anca dx, 54 anca sx e 223 anca dx e sx) affetti da coxartrosi primaria (177 donne - 126 uomini) di età compresa tra 44-86 anni (età media 62.5). I criteri di inclusione considerati: età oltre i 40 anni; grado radiologico II o III (Kellgren e Lawrence); comparsa della sintomatologia da almeno un anno; riduzione del ROM.

Il trattamento prevedeva un ciclo infiltrativo di 3 iniezioni di 2 ml di HA ad alto p.m., eseguite sotto guida ecografica, a distanza di un mese l'una dall'altra. 89 pazienti sono stati esclusi per: positività per malattie reumatiche; assunzione di ASA; terapia concomitante con steroidi intrarticolari; anamnesi positiva per precedente allergia ad acido ialuronico. I 224 soggetti rimanenti sono stati suddivisi, in modo random, in 2 gruppi: A e B. Il gruppo A, formato da 110 pazienti (75 anca dx e sx, 12 anca dx e 23 anca sx) di età



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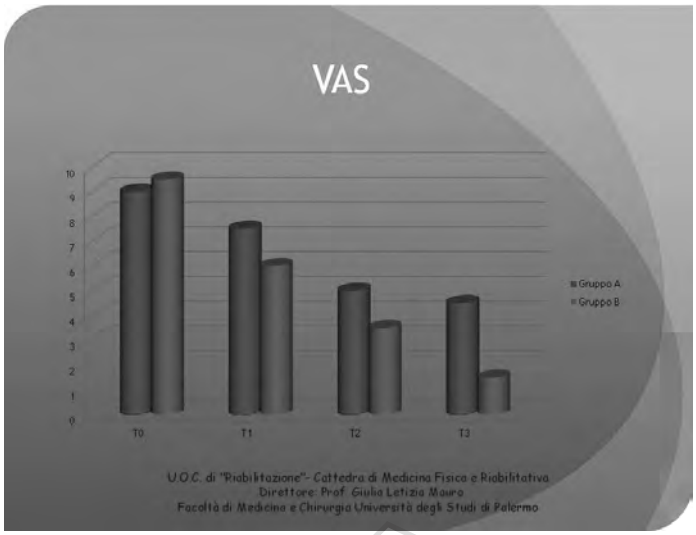

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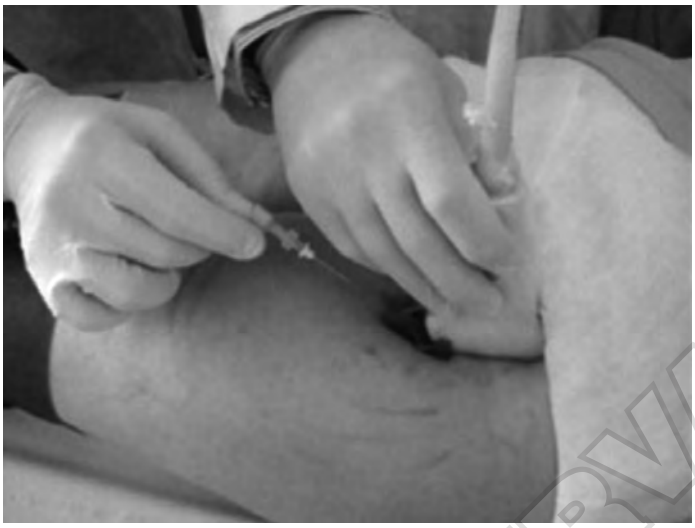

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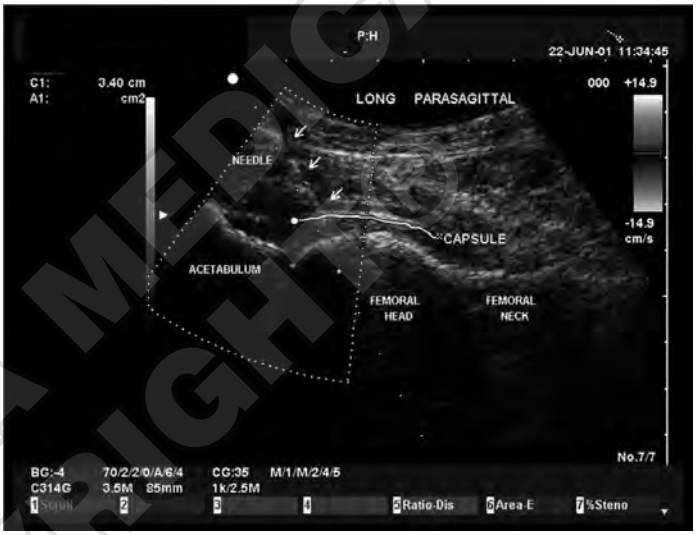

Figura 6

media 61,9 aa, ha effettuato un ciclo di 3 infiltrazioni. Il gruppo B, costituito da 114 pazienti (65 anca dx e sx, 22 anca dx, 27 anca sx) di età media 64,3 aa, ha associato al trattamento infiltrativo un progetto-programma riabilitativo che prevedeva 20 sedute di rieducazione funzionale e 10 di laser Nd Yag giornaliere, per 5 giorni a settimana. Ciascuno è stato sottoposto a visita fisiatrica e sono state somministrate la scala VAS e l'indice funzionale di Lequesne a T0 (I infiltrazione), a T1(II), a T2(III) e a T3 (follow-up a 12 mesi) (Figg. 3 e 4). Le terapie concomitanti concesse erano FANS al bisogno, di cui è stato monitorato il consumo nell'arco dell'intero periodo di osservazione (Figg. 5 e 6).

RISULTATI

Non sono stati osservati effetti collaterali, inoltre nessun paziente ha riferito comparsa di calore, gonfiore e dolore nel sito di inoculazione. Dall'analisi dei risultati si evince che il gruppo B rispetto al gruppo A ha ottenuto un netto miglioramento della sintomatologia algica e un precoce recupero dell'autonomia nello svolgimento delle ADL. Nel gruppo A l'indice medio di Lequesne e della VAS risultava essere rispettivamente di 12.5 e di 6.23 al tempo basale e di 8.5 e 4.25 al follow- up; nel gruppo B, invece, rispettivamente di 12 e 6.5 a T0 e di 7 e 3.5 a T3. Infine, soltanto il 10.7% dei pazienti trattati (24), per il persistere del dolore e della limitazione funzionale, sono stati sottoposti ad intervento chirurgico di artoprotesi.

CONCLUSIONI

L'artrosi d'anca è fra le patologie più frequenti e invalidanti del nuovo millennio. Evidenze scientifiche dimostrano che un numero sempre maggiore di soggetti, anche giovani, si sottopone precocemente ad interventi di protesizzazione. Il presente studio è stato effetuato al fine di ottenere evidenza clinica sull'effetto analgesico immediato e a medio termine della terapia infiltrativa eco-guidata con HA a medio/alto p.m. I risultati mostrano come 3 infiltrazioni, eseguite a distanza di 30 giorni l'una dall'altra, siano ben tollerate e determinano un elevato grado di soddisfazione da parte del paziente, in termini di efficacia per almeno 6 mesi. Il follow-up a 12 mesi ha evidenziato un effettivo mantenimento dei risultati, soprattutto nei pazienti che hanno associato al trattamento infiltrativo quello riabilitativo.

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Comparison of efficiency between high intensity laser therapy (HILT) and interferential current (IC) in patients with knee osteoarthritis

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Osteoarthritis (OA) is the most common chronic joint disorder. It usually results in pain and deformity, ultimately leading to chronic disability[1]. OA has a significant negative impact on most economies – for example in the UK economy, OA has a total cost estimated to be equivalent to 1% of the Gross National Product per year[2]. OA affects articular cartilage which results in focal lesions and other structures such as the subchondral bone with a hypertrophic reaction (sclerosis) and a new bone formation (osteophytes). Periarticular muscle weakness, lax ligaments, low grade synovitis, meniscal degradation and neurosensory system alteration are frequently present in these patients[3]. Knee osteoarthritis (KOA) is the most frequently affected site of osteoarthritis. It is strongly related to age. One third of people aged 65 years and older have KOA, which is evident by radiography (ROA). The prevalence of radiographic osteoarthritis (ROA) in the knee is expected to increase because of the current rise in both longevity and the prevalence of obesity[4]. Before the age of 50, men are more likely to have osteoarthritis (OA) than women, but after the age of 50, women are statistically more likely to be affected[5]. The prevalence of clinically diagnosed KOA is 18,1% in those over 55 years of age[6] and significant knee pain has an annual prevalence of 25%[7]. Moreover, OA accounts for 80% of all total knee replacement procedures.

Laser therapy is based on the belief that laser radiation (and possibly monochromatic light in general) is able to alter cellular and tissue functions in a manner that is dependent the characteristics of the light itself (e.g. wave length, coherence)[8]. In 1960, New York physicist Theodor H.Maiman constructed the first laser, in which an active medium of synthetic rubbing crystal emits radiation in a visible spectrum. In the 1970's, the use of this laser began in the medical domain. Conventional Laser therapy is applied through devices featuring low or medium power. It is used to treat superficial disorders. Yet it does not allow to treat deep seated pathologies, since it does not permit to deliver the necessary high doses of energy to deep layers without inducing thermal damage to tissues. More recently, high-intensity laser therapy (HILT), which involves higher-intensity laser radiation and which causes minor and slow light absorption by chromophores, has been used[9]. High Intensity Laser Therapy (HILT) stimulates deep tissue and metabolism of the cells by photochemical effects, slows down transmission of pain and increases production of endogenous opiates which results in reduced pain. Simultaneously, the laser corrects functional ability. Moreover, HILT is not toxic and can be performed without damaging the tissues surrounding the pathology.

Interferential current (IC) also has analgesic, anti inflammatory and antiedemic effects. The analgesic effect is based on stimulation of sensory "AB" neurofibers which activate the interneurons in the back horn of the spinal column, which blocks the pain stimulus towards the higher parts of the CNS[10].

In the treatment of knee osteoarthritis, medical exercises are one of three non-pharmacological interventions as core approaches, suggested by NICE guideline[11]. Among of them are activity and exercise including local muscle strengthening and general aerobic fitness.

The main goal of this article was to compare the efficiency of High Intensity Laser Therapy (HILT) and interferential current (IC) in the treatment of pain and the improvement of functional ability in patients with knee osteoarthritis.

METHODS

Prospective study was conducted in Centre of Physical and Rehabilitation Medicine, University Hospital Center, Rijeka, Croatia, during the year 2011. The participants were 100 patients with clinical and radiological signs of unilateral knee osteoarthritis which was graded by the Kellgren-Lawrence (K/L) grading scale[12] (Table I).

These patients were randomly assigned to 2 groups. In both groups was unilateral knee osteoarthritis, grade 2 and 3 by the Kellgren-Lawrence scale.

Group "A" had 50 patients who were treated with High Intensity Laser Therapy – HILT. We used the wave length of 1064 nm, peak power to 3 kW and duration for the single impulse of less than 120 μs. The HILT treatment was performed with Neodymium YAG pulse wave (Nd; YAG PW) device (ASA HIRO 3,0 ® USA). The therapy lasted 20 min daily following the specified treatment protocol.

In group "B" there was 50 patients treated with interferential current (IC) that was performed by Endomed (Enraf-Nonius

Table I.—*Kellgren-Lawrence grading scale.*

Grade I	Doubtful narrowing of joint space and possible osteophytic lipping
Grade II	Definite osteophytes, definite narrowing of joint space
Grade III	Moderate multiple osteophytes, definite narrowing of joints space, some sclerosis and possible deformity of bone contour
Grade IV	Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour

BV,Vareseweg127, Rotterdam, the Netherlands) a device that was operated by use four vacuum electrodes with resulting current of 100 Hz for 15 minutes.

Both groups performed medical exercise of local muscle strengthening (quadriceps muscle isometric strength). All participants in the 2 treatment groups received 10 treatment sessions over a period of 2 consecutive weeks (5 days per week).

Specific test were given for testing the efficiency of both therapies: a visual analog scale VAS[13] and specific Lequesne functional index[14]. The VAS is used to measure pain on a 100 mm horizontal axis between the extreme left endpoint of no knee pain and the extreme right endpoint of worst pain ever. The distance is measured and pain is recorded on a 100-point scale[13]. This scale is generally accepted as a valid measure of pain, with good construct validity[15,16].

Among the several disease-specific instruments used to assess functional impairment in knee osteoarthritis, specific Lequesne functional index is one of the most widely used in clinical trials. Lequesne functional index for KOA provided information about pain (nocturnal, while resting, walking, weight bearing, stair climbing), stiffness (in the morning, during the day) and physical function (difficulties while going up or downstairs, distance of walking without or with a stick or crutches, bending, walking on uneven surfaces).

The participants were assessed by a physiatrist at the baseline (before the first treatment session) and at the end of physical therapy.

The patients received no other physical therapy intervention for knee pain during the study and were allowed to receive analgesic drug (paracetamol no up to 1000 mg daily) for not more than three consecutive days.

All statistical analysis were performed using Statistica 9.1. (StatSoft Inc.,Tulsa, USA) and SPSS for Windows, version 16,0 (SPSS Inc., Chicago, IL, USA). The data (age, sex and affected side, right-left) are expressed as means ± standard deviation. The initial and final values in VAS and functional Lequesne index of both groups were compared by dependent sample Student's t test. For all the analyses, significance was established when P<0.05.

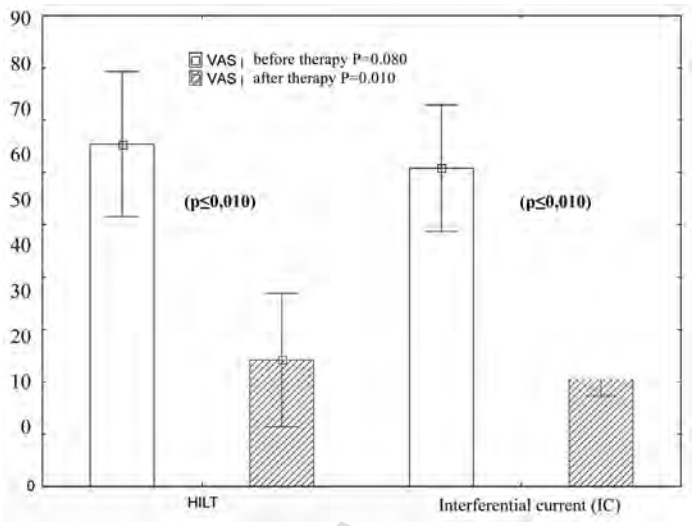

Figure 1.—Visual analogue scale (VAS) of pain before and after therapy in both HILT and IC group.

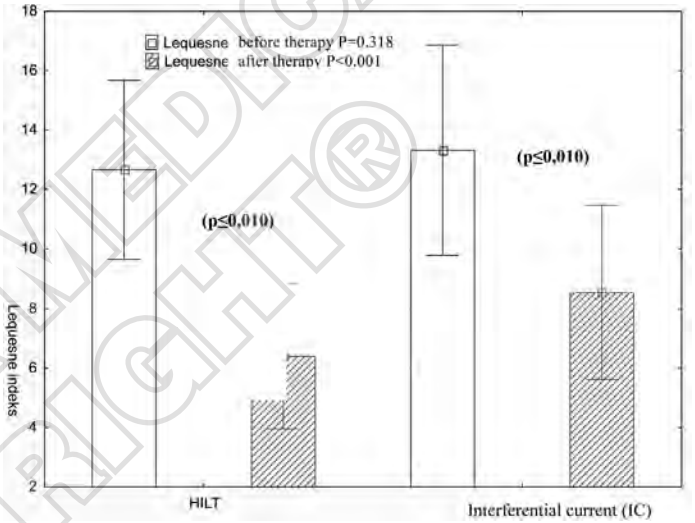

Figure 2.—Lequesne functional index for KOA before and after therapy in both HILT and IC group.

RESULTS

Baseline demographic data from all subjects enrolled in this study are summarized in Table II. The results show that there were no differences between HILT and IC groups according to age, gender (with the prevalence of women in both group) and affected side, right- left (Table II). All participants had X-ray scans of the knee joint and stage of KOA was graduated by the Kellgren-Lawrens scale and there was no statistically significant difference between the two groups. The grade was between two and free, closer to two.

Visual analogue scale (VAS) of pain before and after the therapy in both HILT and IC groups is shown in Figure 1.There was no statistically significant difference between HILT and IC group according to the level of baseline knee pain (P=0.080). At the end of the treatment in each group there was a significant decrease in knee pain level (p<0,010) compared with baseline value. However, at the end of the treatment in HILT group, there was a statistically more significant decrease in pain level than in IC group (P=0,010)

Lequesne functional index for KOA before and after therapy in both HILT and IC group is shown in Figure 2.There was no statistically significant difference between HILT and IC groups according to the level of baseline Lequesne index (P=0,318). Functional ability testing with Lequesne index at the end of the therapy in each group showed a significant increase (P<0,010). However, at the end of the treatment, in HILT group, there was a statistically

Table II.—*Baseline demographic characteristics of participants with knee osteoarthritis (KOA) in high intensity laser therapy (HILT) and interferential current (IC) therapy group.*

	HILT (N=50)	IC (N=50)	statistics
AGE			
$\bar{x}$ (SD)	58.84±5.92	58.9±5.63	P=0.959
median (5^{th}-95^{th}) percentile	58.5 (48-69)	59 (50-67)	P=1.0
SEX N(%)			
male	13 (26)	9 (18)	χ^2=0,93
female	37 (74)	41 (82)	P=0,334
AFFECTED SIDE N(%)			
left	23 (46)	25 (50)	χ^2=0,16
right	27 (54)	25 (50)	P=0,689

more significant increase in functional ability than in IC group (P<0,001).

DISCUSSION

Patients with osteoarthritis of the knee are commonly treated by physical therapists. Practice should be informed by updated evidence from systematic reviews. In particular, Jamtvedt and colleagues summarized the evidence from systematic reviews (published between 2000 and 2007) on the effectiveness of physical therapy for patients with knee osteoarthritis. They graded the quality of evidence across reviews for each comparison and outcome. Twenty-three systematic reviews on physical therapy interventions for patients with knee osteoarthritis were included. There is high-quality evidence that exercise and weight reduction reduce pain and improve physical function in patients with osteoarthritis of the knee. There is moderate-quality evidence that acupuncture, transcutaneous electrical nerve stimulation, and low-level laser therapy reduce pain and that psycho educational interventions improve psychological outcomes. For other interventions and outcomes, the quality of evidence is low or there is no evidence from systematic reviews[17].

In our study we have compared a new treatment option HILT with an accepted physical therapy modality, IC therapy**.** At the end of treatment, improvement was observed in both parameters, level of pain and functional ability with the following statistically significant differences from baseline values, (P<0.050). Study results showed favorable effects of both HILT and IC on the level of pain and functional ability in both group patients with KOA. But when we compared the efficiency of both therapy, the patients treated with HILT showed a greater reduction in pain and greater improvement in functional ability of the affected knee.

Gundog and colleagues in a more recent study published in February 2012 demonstrated the superiority of the IC with some advantages on pain and disability outcomes when compared with sham IC for the management of knee osteoarthritis. However, the effectiveness of different amplitude-modulated frequencies of IC was not superior when compared with each other[18].

Some authors have suggested that Low intensity laser therapy (LILT) could be an effective physical therapy intervention for decreasing pain in KOA. Lower dosage of LILT was found as more effective than higher dosage for reducing pain and improving knee range of motion[19, 20].

Santamato and colleagues found greater effectiveness of HILT than of therapeutic ultrasound in the treatment of shoulder subacromial impingement[21]. Fiore *et al.* reported their findings obtained after 15 treatment sessions with the experimental protocol suggested greater effectiveness of HILT than of US therapy in the treatment of low back pain (LBP), proposing HILT as a promising new therapeutic option into the rehabilitation of LBP[22].

However, to our knowledge, very few studies have been conducted to date on the possible effects of HILT on KOA. In previous study we showed a great and statistically significant reduction in pain in patients treated with HILT therapy. Our protocol of 10 treatment sessions over a period of two consecutive weeks could be challenging to apply in clinical practise[23]. In the present study the participants treated with HILT showed a significant pain reduction and improved joint function. We also compared the efficiency of HILT therapy with the accepted physical therapy modality, IC therapy[24]**.**

The main drawback of our study was the lack of follow-up data, which reduces the clinical application of our findings on the short-term effects of HILT.

CONCLUSIONS

The results have shown a statistically greater analgesic efficiency and functional improvement in patients treated with HILT compared to patients treated with IC. Non pharmacological therapies are part of all protocols for treating KOA. We have found the application of High Intensity Laser Therapy (HILT) to be a reliable and efficient option in physical therapy of knee osteoarthritis.

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The electronically controlled dynamic backrest to contain children with dystonic cerebral palsy: an innovation in the seating systems

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Children with dystonic cerebral palsy (CP) have violent and unpredictable contractions that often cause damage to anatomical structures as a result of the impact with their posture system. For these patients the primary concern is to be supported during the dystonic episodes without losing contact with the sitting system and subsequently return to the starting position. Driven by the need to create an innovative system able to support a controlled collapse and return to a balanced position, the ITOP Spa Ortopeadich workshops in collaboration with IRCCS Bambino Gesù from Palidoro has designed and built an innovative system called: "Electronically Controlled Dynamic Backrest" (ECDB) (fig.1), aimed at recording and characterizing the kinematic data of movement. This type of data is absent in the literature but of critical need in order to appropriately evaluate and treat patients with dystonic CP.

MATERIALS AND METHODS

Beginning September 1st 2011, to present, the Department of Neurorehabilitation of IRCCS "Bambino Gesù" has been testing the medical device ECDB. Testing was conducted using a suitably defined and subsequently applied clinical protocol with the aim of evaluating the clinical and functional outcomes of 8 patients recruited to the trial. We evaluated the single case study and the group of dystonic subjects, without using control groups or double-blind studies because it is impossible for this type of medical device. The specific aims were as follows:

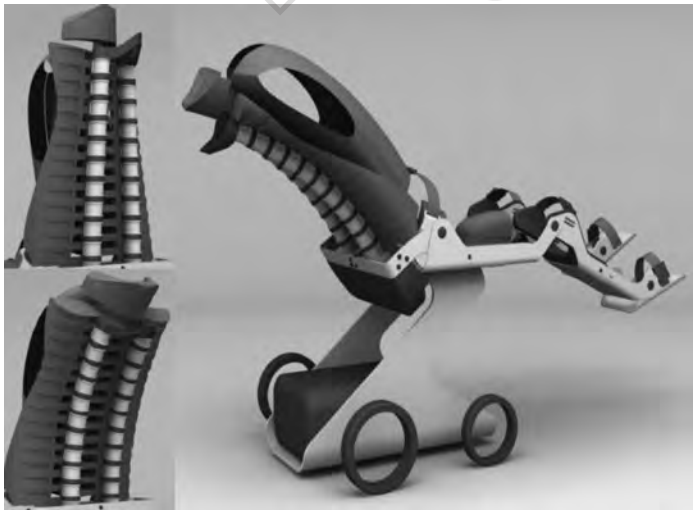

Figure 1.—Electronically controlled dynamic backrest.

1. *Recruitment protocol for patients of ECDB*: Patients were selected based on the diagnosis of dystonic tetraparesis, and divided into two groups according to their morphology: small body size and large body size.

2. *Assessment protocol for the dystonic child*: Consists of seven rating scales administered in the following order: 1° "Fahn Marsden Rating Scale", 2° "Unified Dystonia Rating Scale", 3° "Global Rating Scale", 4° "Barry-Albright Dystonia Scale", 5° "Level of Setting Scale", 6° "Movement Disorder Childhood Rating Scale for patients age 0-3"e "Movement Disorder Childhood Rating Scale for age 4-18" e 7° "Gross Motor Function Measure". The protocols were administered at the beginning and every three months.

3. *The video recording protocols*: Video recording of the child with CP, developed by GIPCI, and the video recording with the medical device.

4. *Processing and data recording:* the therapist processes the data provided by the rating evaluations and recorded the results. Then the therapist processed the movies from the protocols of video recording.

RESULTS

It can be difficult to quantitate the dynamic symptoms resulting from CNS diseases. It is common practice to describe these symptoms qualitatively which can limit approaches to new treatment and/or therapies, and as such, one of the main purposes of this trial was to collect a large amount of kinematic data in order to quantitate the characteristics and kinetics of dystonias which accurately represent patients with CP. A main goal was to detail a patient's range of motion and activity so as to develop an electronic system that could support and control the patient, in order to develop clinical and rehabilitation protocols that are more specific and effective.

We analyzed, in the sagittal plane, the flexion/extension of the knee and ankle joints; for the vertebral column the flexion/extension in the sagittal plane, the side bending in the frontal plane and the torsion in the transverse plane. Specifically, our group has analyzed the following data: the dynamic trajectories of patients during dystonic episodes, the speed and the acceleration of body movements of interest, the strength and power associated with such movements, the frequency and duration of each episode, patient compliance, and the possible resistance by the patient to counterat the systems facilitation of return to the initial position. The backrest consisted of two columns, each crossed by a cable controlled by a motorized system which records tension in the cable. Thus the tensions exerted on the system by the patient during

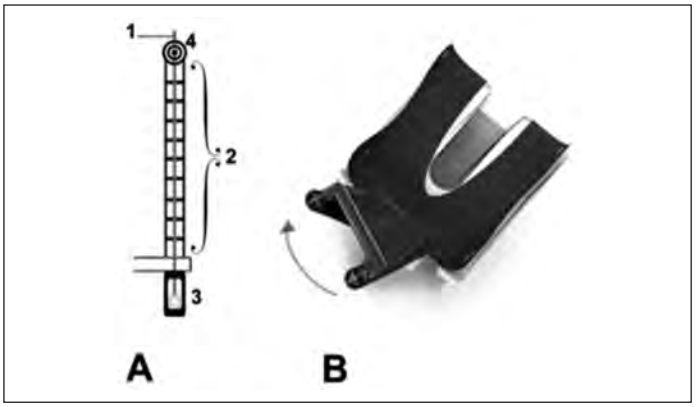

Figure 2.—Torsional movement of the columns.

dynamic movement can be recorded, while allowing maximum freedom of adaptation (fig. 2). In particular we investigated the potential of each column to deform under the pressure imposed by the patient's trajectory during the dystonic episode. We were able to record the extent and torsional movement of the patient, in a controlled manner until the end of the thrust, and subsequently observed the effectiveness of the medical device in returning the patient back to the starting position. We also evaluated the child's reaction to the system, as it was not known a priori whether the interaction with this dynamic device had the potential to induce negative reaction (stress, fear or loss of orientation), or if, on the contrary, the ability for the ECDB to adapt and release the potential energy during the dystonic event, might reduce stress and the patient's discomfort.

TOPICS

During the course of our study, we assessed the controlled containment and effectiveness of the postural system, with respect to the asymmetrie and postural adaptations that many patients with dystonic tetraparesis present with. Initially, the ECDB was equipped with a standard backrest and upon secondary improvements was adapted with the customized backrest. The modification was based on the level of comfort expressed by the patients, and on the reaction of the patient to the dynamics of the device. ECDB is capable of adapting to a patient and achieving an optimal containment posture that allows the dystonic patient to move freely.

CONCLUSIONS

The data collected during our studies with the ECDB validate the functional containment, adaptability and customization of the system as a device highly suitable to the needs of users. This data can also be used during post-operative recovery, in the medical and physiotherapeutic sense, tracking dynamic changes during dystonic episodes, and highlighting the effectiveness of one mode treatment over an other. The use of a dynamic system reduces physical impact between the patient and their postural containment system, increasing patient confort and reducing secondary damage associated with vigorous dystonic contractions. In order to strengthen these objective conclusions, larger experimental time periods would provide useful data and information with respect to long term patient improvement and applications in pathologies. However it was evident that the dynamic system is able to provide significant assistance in the return to basic postures, more than the traditional system in use, because the traditional wheelchair do not adapt to the dynamic torsional and retroplsive movements of a patient during a dystonic episode or support a controlled fall. In addiction, ECDB offers continuos monitoring of the thrust exerted by the patient, at the level of the fulcrum, and adapts instantaneously to directional changes by the patient. This data indicate the ECDB is a valid and useful solution to the limitations of current devices on the market.

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Trigeminal neuralgia - Clinical series

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Hospital de Faro, E.P.E

Trigeminal neuralgia, also known as tic douloureux, prosopalgia, the Suicide Disease or Fothergill's disease is a neuropathic disorder characterized by episodes of intense unilateral pain in the face, often accompanied by a brief facial spasm or tic, originating from the trigeminal nerve, that last from a few seconds to several minutes or hours. The attacks are said by those affected to feel like stabbing electric shocks, burning, pressing, crushing, exploding or shooting pain. One theory refers to the possibility of an enlarged blood vessel - possibly the superior cerebellar artery - compressing or throbbing against the microvasculature of the trigeminal nerve near its connection with the pons, leading to pain. Other causes are an aneurysm, a tumor, an arachnoid cyst in the cerebellopontine angle or a traumatic event such as a car accident or a tooth removal. In about 85% of cases, no lesion is identified, even after extensive investigations, and the etiology is labeled idiopathic by default.

Patients with characteristic history and normal neurologic examination may be treated without further workup. Some physicians recommend elective MRI for all patients to exclude an uncommon mass lesion or aberrant vessel compressing the nerve roots.

Botulinum toxin type A has been studied as a potential tool in the treatment of several pain syndromes. It has been used in trigeminal neuralgia when it becomes unresponsive to other treatments such as carbamazepine, oxcarbazepine, phenytoin, clonazepam, lamotrigine, valproic acid, gabapentin and pregabalin. The purpose of this study is to see the evolution in the VAS scale evaluation in different patients after botulinum toxin type A injection.

MATERIALS AND METHODS

Three patients, with different causes of trigeminal neuralgia, were treated with botulinum toxin type A.

Case 1

A 51-year-old female presented in Neurorehabilitation consultation after a tooth removal, with severe paroxysmal pain, which she described as an electric shock, in the left hemifacial area, mainly involving the territory of the left maxillary (V2) branch. The trigger point was located in the left nasolabial fold. The patient said that at one time she wished death. Neurological examination was normal. A brain MRI with contrast enhancement was normal. She was treated before with carbamazepine, gabapentin and oxcarbazepine. Forty units (40U) of botulinum toxin type A (Botox®) were injected in the V2 trigeminal area (Figure 1).

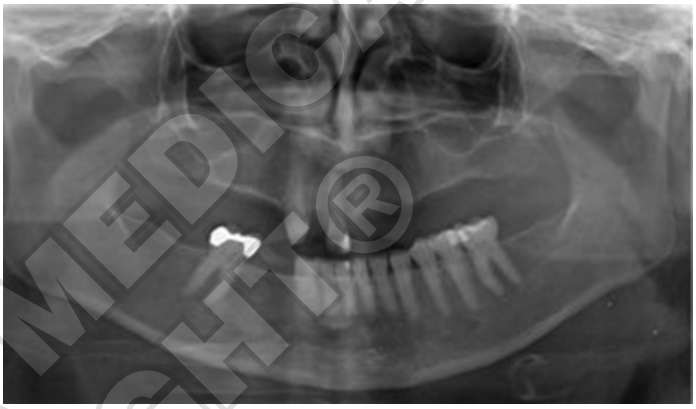

Figure 1.—Mandible X-ray.

Case 2

A 66-year-old female presented in Neurorehabilitation consultation after a dental implant, with severe pressing pain, involving the territory of the left mandibular (V3) branch. Neurological examination was normal. A brain MRI with contrast enhancement was nor¬mal. She was treated before with pregabalin. Forty units (40U) of botulinum toxin type A (Botox®) were injected in the V3 trigeminal area.

Case 3

A 68-year-old female presented in Neurorehabilitation consultation. She was targeted in the face fourteen years ago and since there she has a crushing pain in the left hemifacial area, mainly involving the territory of the left maxillary (V2) branch and the left mandibular (V3) branch. Neurological examination was normal. A brain MRI with contrast enhancement shows the bullet inside of the skull. She was treated before with gabapentin. One hundred and fifty units (150UI) of botulinum toxin type A (Dysport®) were injected in the V2 trigeminal area and thirty units (30UI) in preauricular area.

Table I.—*VAS evaluation before and after Botulinum toxin injection.*

	VAS (Baseline)	VAS (12 week post-injection)
Case 1	10	5
Case 2	10	6
Case 3	10	5

RESULTS

Case 1: Baseline VAS evaluation: 10 points. Evaluation at 12 week post-injection: VAS: 5 points.

Case 2: Baseline VAS evaluation: 10 points. Evaluation at 12 week post-injection: VAS: 6 points.

Case 3: Baseline VAS evaluation: 10 points. Evaluation at 12 week post-injection: VAS: 5 points (Table I).

DISCUSSION

In these three cases, all the patients had different causes for their pain, but all of them had a VAS baseline of 10. After 12 weeks after the injection of botulinum toxin type A, their pain reduced significantly and they were very satisfied with the new treatment.

CONCLUSIONS

Trigeminal neuralgia is a neuropathic disorder characterized by episodes of intense unilateral pain in the face. In these three cases we observed different etiologies for this acute pain. The treatment with botulinum toxin type A seemed to have good results in decreasing pain in these patients. It´s important to consider botulinum toxin type A as alternative treatment in patients with trigeminal neuralgia.

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Neurorehabilitation in multiple sclerosis

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Multiple sclerosis (MS) is a variable inflammatory disease where symptoms can be different in each person and overtime. Multiple sclerosis affects mainly women and white people. The disorder is most commonly diagnosed between ages 20 and 40. The fatty myelin sheaths around the axons of the brain and spinal cord are damaged by one's own immune system, leading to demyelination and scarring as well. Thus, the condition is called an autoimmune disease. The most common types of MS are relapsing-remitting MS, primary-progressive MS, secondary-progressive MS and progressive-relapsing MS. It is unknown what exactly causes this to happen. There have been described multiple factors like age, climate, latitude, social-economic condition, virus and genetic predisposition. The diagnosis of MS depends on clinic, laboratorial and image information. Lumbar puncture, MRI scan of the brain and of the spine and nerve function study (evoked potential test) are important to help in the diagnosis. Most common symptoms are fatigue, spasticity, weakness in one or more arms or legs, numbness, coordination problems, bladder dysfunction, bowel dysfunction, vision problems, dizziness and vertigo, sexual dysfunction, pain, cognitive dysfunction, emotional changes and depression. Neurorehabilitation have a crucial role in MS patient´s treatment, in their quality of life, activities and participation in the society. The multidisciplinary team with the physiatrist, physical therapy, speech therapy and occupational therapy is essential in this process. Botulinum toxin type A has been very important in this patient´s rehabilitation, especially in spasticity treatment. The objective of the research is to characterize the neurorehabilitation consultation patients with multiple sclerosis in Hospital de Faro,E.P.E and search the importance of neurorehabilitation and botulinum toxin type A in their quality of life.

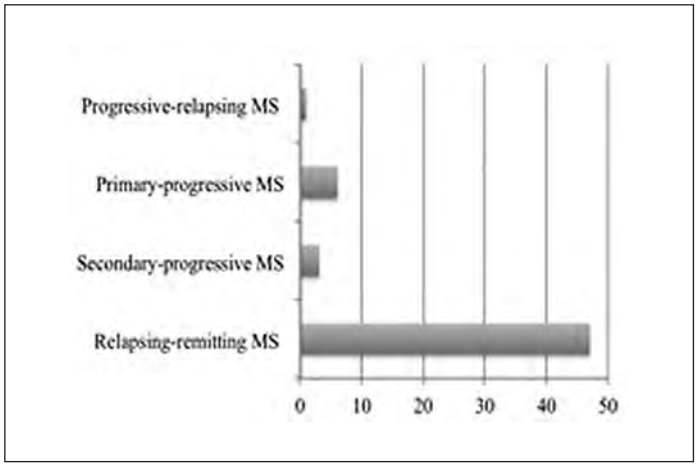

Figure 1.—Types of multiple sclerosis.

MATERIALS AND METHODS

In this study, 753 patients of neurorehabilitation consultation have been analyzed, between 2007 and 2012. Those with the diagnosis of multiple sclerosis were searched. For each patient were registered gender, age, functional history, type of MS, year of the first symptoms and of diagnosis, neuromotor principle symptoms, additional symptoms, treatment used (physical therapy, speech therapy, occupational therapy, botulinum toxin type A), the evolution with the rehabilitation programme and their functionality in the present.

RESULTS

Multiple sclerosis was present in 57 (7.6%) of the 753 patients searched. Women represent 63.2% of the patients with MS in this study. The mean age of MS patients was 46.9 years. The mean age of the first symptoms and diagnosis was 33.4 and 36.1 years, respectively. Relapsing-remitting MS was more common (82%). Primary-progressive MS represented 11%, secondary-progressive MS 5% and progressive-relapsing MS 2% (Figure 1) Paraparesis was present in 61% of MS patients, tetraparesis 21%, hemiparesis 14% and monoparesis 4%. Symptoms representation were fatigue 93%, spasticity 16%, dysarthria 9%, numbness 14%, coordination problems 70%, bladder dysfunction 86%, bowel dysfunction 44%, vision problems 94.3%, sexual dysfunction 28%, pain 23%, emotional changes and depression 56%. Physical therapy was part of the treatment in 94.7 % of the patients, occupational therapy in 42.1% and speech therapy in 26.3%. Botulinum toxin type A was used in 14% of these patients. The most injected muscles in descending order were: Gastrocnemius (15 times), Soleus (11 times), Rectus femoris (9 times), Tibialis posterior (6 times), Adductor brevis (5 times), Tibialis anterior (3 times), Flexor hallucis longus (2 times), Flexor carpi radialis (1 time), Flexor carpi ulnaris (1 time) e Brachioradialis (1 time) (Figure 2). When used Botox® ou Xeomin®, in mean 313 UI were injected by session. When used Dysport®, in mean 600 UI were injected by session; 87% of patients treated with botulinum toxin type A felt less spasticity, pain and better gait pattern. No complications were reported. Actually, after the rehabilitation programme, 73.7% of these patients are independent now compare to 68.4% before.

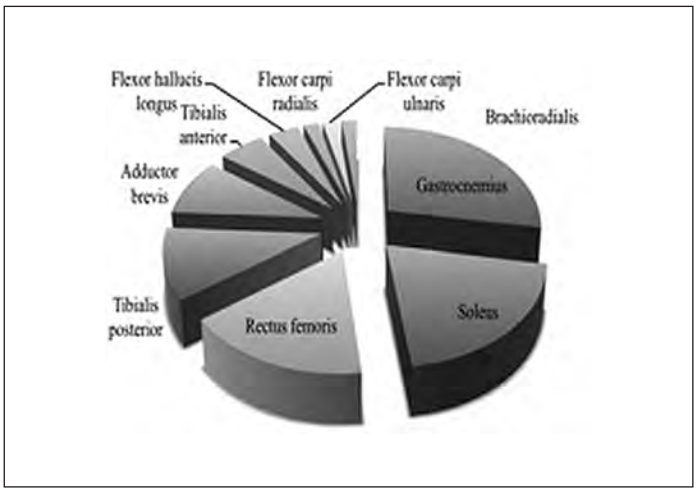

Figure 2.—Muscles injected with botulinum toxin type A.

DISCUSSION

In this study, multiple sclerosis was more prevalent in women. The mean age of the first symptoms was 33 years. Relapsing-remitting MS was the more common type. Paraparesis was the neuromotor status more frequent. Coordination problems, fatigue, visual problems, bladder dysfunction, bowel dysfunction and depression were the predominant symptoms. Rehabilitation programme included more Physical therapy then Occupational or Speech therapy. Patients treated with Botulinum toxin type A felt less spasticity, pain and better gait pattern. Gastrocnemius and Soleus were the more injected muscles. After the rehabilitation programme, more patients became independent in their activities and participation.

CONCLUSIONS

Multiple sclerosis is a variable inflammatory disease where symptoms can be different in each person and overtime. Neurorehabilitation have a crucial role in MS patient´s treatment, in their quality of life, activities and participation in the society. The rehabilitation programme and treatment with botulinum toxin type A had good results in spasticity, pain and gait pattern in this study.

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L'importanza dello screening precoce e del trattamento personalizzato: uno studio sulla relazione tra depressione, fatica e disturbi cognitivi nella sclerosi multipla

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La letteratura scientifica riporta una frequenza significativa dei disturbi psicologici nella sclerosi multipla (SM): le persone sviluppano con una probabilità del 50 % un disturbo di tipo depressivo [1], sono frequenti deficit della sfera cognitiva (43-70 %)[2], anche se di entità variabile da soggetto a soggetto. Le funzioni cognitive maggiormente colpite nella SM sono attenzione, memoria di lavoro, memoria a lungo termine, funzioni esecutive e visuo-spaziali [3]. Questi disturbi spesso si sovrappongono con la presenza di fatica che è un sintomo somatico riferito dai pazienti in una percentuale del 75% [4]. Alcuni studi hanno evidenziato correlazioni positive tra fatica e livelli dell'umore [5], senza però chiarire del tutto la natura del loro rapporto [6]. La relazione tra depressione e disturbi cognitivi è un altro aspetto importante. Alcuni studi dimostrano l'impatto negativo della depressione sui disturbi cognitivi: i pazienti depressi riportano una minore accuratezza nei compiti rispetto ai non depressi [7]. Il presente studio ha l'obiettivo di indagare le eventuali correlazioni tra depressione, fatica e disturbi cognitivi nella SM. Indagare come si potrebbero influenzare questi tre fattori al momento della presa in carico della persona, ci permetterebbe di fare una diagnosi il più possibile puntuale e precoce, al fine di intervenire su uno o l'altro aspetto patologico influenzando positivamente gli altri. Il tutto a vantaggio di un intervento terapeutico riabilitativo mirato, basato su dati oggettivi e misurabili nel tempo, tali da consentire un monitoraggio della reale efficacia dello stesso. Un intervento precoce e focalizzato, quindi, permetterebbe di sostenere il paziente verso un adattamento alla malattia più funzionale. I nostri obiettivi sperimentali sono stati: confermare o meno i dati di frequenza presenti in letteratura rispetto a depressione e disturbi cognitivi nel nostro campione; valutare attraverso un colloquio clinico e la somministrazione della Beck Depression Inventory (BDI II) la presenza o meno di depressione e più nello specifico di sintomi cognitivi e/o somatico-affettivi (punteggio totale, punteggio cognitivo, punteggio somatico-affettivo); valutare eventuali correlazioni tra depressione, disturbi cognitivi e fatica.

MATERIALI E METODI

Partecipanti: 30 pazienti affetti da SM (Criteri di Polman [8]), (23 F e 7 M - età media 50,62; std. 12,402), reclutati durante le visite fisiatriche, presso l'Unità Operativa Distrettuale di Riabilitazione dell'Adulto. Sono stati esclusi i pazienti con diagnosi di disturbo psichiatrico antecedente alla diagnosi di SM.

Procedura

La valutazione comprendeva (1) un colloquio clinico e la somministrazione del BDI II (per i punteggi di depressione totale, cognitiva e somatico-affettiva)[9], e della Fatigue Severity Scale (FSS) per misurare la fatica [10]; (2) uno screening delle funzioni neurocognitive (Figura Complessa di Rey copia e riproduzione differita, Trail Making Test versione A e B, Test del Breve Racconto, Matrici Attenzionali, Test di Fluenza Verbale) [11].

Analisi statistica

Per valutare le differenze tra frequenze abbiamo utilizzato il test del chi quadro e, quando appropriato, il test binomiale con percentuale attesa del 50%. Per le correlazioni, invece, il coefficiente rho di Spearman, in ragione della distribuzione non normale dei nostri dati. Il valore di p assunto come significativo è stato: p= 0,05. Il software utilizzato è stato SPSS 11.

RISULTATI

I risultati di frequenza sono i seguenti: disturbi cognitivi 53,3%; depressione 60%. Avendo utilizzato il BDI II, abbiamo valutato le differenze rispetto alla frequenza di sintomi cognitivi o somatico-affettivi. La frequenza dei sintomi somatico-affettivi risulta essere del 46,7%, mentre quella dei sintomi cognitivi del 56,7%. Confrontando le due frequenze, abbiamo trovato una maggioranza di depressione cognitiva con una tendenza alla significatività (test binomiale con percentuale attesa del 50%: p= 0,064). L'analisi con il chi quadro non ha prodotto risultati significativi. Nessun risultato è stato trovato correlando la depressione e i disturbi cognitivi, ed i disturbi cognitivi e la fatica. Abbiamo riscontrato correlazioni significative positive tra: (1) punteggio totale BDI II e fatica (rho di Spearman = 0,645 con p < 0,001); (2) punteggio cognitivo BDI II e fatica (rho di Spearman = 0,454 con p= 0,023); (3) punteggio somatico-affettivo BDI II e fatica (rho di Spearman = 0,677 con p < 0,001). Post hoc, sono stati effettuati dei T-test per gruppi indipendenti: (var. indip. presenza/assenza fatica, T-test tra depressione somatico-affettiva e fatica, $t_{(23)}$= - 4,096; p<0,001; T-test tra depressione cognitiva e fatica e T-test tra depressione totale e fatica - non significativi). I risultati significativi sono riportati nella tabella I.

Tabella I.—*Analisi dei dati – Risultati significativi.*

	Frequenze	Valore p
Depressione	60%	
Depressione somatico-affettiva	46,7%	
Depressione cognitiva	56,7%	
Test binomiale (perc attesa 50%)		p = 0,064
Disturbi cognitivi	53,3%	
	Correlazioni	Valore p
Depressione totale * Fatica	rho di Spearman = 0,645	p < 0,001
Depressione cognitiva * Fatica	rho di Spearman = 0,454	p = 0,023
Depressione somatico-affettiva * Fatica	rho di Spearman = 0,677	p < 0,001
	T-test	Valore p
Var X: Fatica Var Y: Depressione somatico-affettiva	$t_{(23)}$ = - 4,096	P < 0,001

CONCLUSIONI

I nostri risultati confermano la letteratura rispetto alla frequenza dei disturbi cognitivi [2] e della depressione [1] nella SM. Questo studio evidenzia come vi sia una correlazione molto significativa tra fatica e depressione nelle persone colpite da SM. In particolar modo, nel punteggio somatico-affettivo del BDI II. Si è evidenziata una tendenza alla significatività nelle persone del nostro campione a sviluppare una depressione con prevalenza di sintomatologia cognitiva. Questi risultati, sebbene vadano confermati con ulteriori studi e ampliando il campione preso in considerazione, possono far ipotizzare una teoria sulla dinamica della relazione tra depressione e fatica nei pazienti con la SM. La relazione tra depressione e fatica potrebbe stare in questi termini: da un lato, la sensazione di fatica e i sintomi fisici portano il paziente a cercare un adattamento, che quando fallisce, sfocia in una depressione (nel nostro campione a prevalenza cognitiva - pessimismo, senso di colpa, autocritica, inadeguatezza); dall'altro, la depressione, il progressivo isolamento e la sensazione di inutilità non fanno altro che esacerbare la sensazione di fatica in un circolo vizioso. Intervenire terapeuticamente su uno dei due aspetti potrebbe modificare positivamente entrambi. Nel nostro campione, alcuni soggetti riportano una depressione a prevalenza somatico-affettiva: questo non cambia la forte correlazione tra depressione e fatica, quello che dovrebbe cambiare è la strategia dell'intervento terapeutico proposto che dovrebbe essere diverso a seconda dei sintomi depressivi prevalenti.

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Effetti del training di bilanciamento posturale con pedana oscillante a perno centrale in bambini con danno acquisito del SNC. Studio preliminare

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Soggetti che hanno subito un danno acquisito del SNC presentano una difficoltà specifica ad attivare e regolare il timing della contrazione muscolare che comporta una difficoltà nella competenza di bilanciamento posturale.[1] Questa condizione determina un degrado funzionale di altre capacità adattive sostenute dal bilanciamento posturale (visione funzionale, alimentazione, raggiungimento/afferramento manuale, passaggi posturali, ecc.)[2, 3] Lo scopo del presente studio è delineare una metodologia di valutazione e di training del bilanciamento posturale del tronco che mostri un evidenza di incremento della funzione posturale e delle competenze da questa sostenute nel trattamento riabilitativo post-acuzie.

MATERIALE

Per il training è stata usata una pedana oscillante a perno centrale a 3 gradi di libertà con caratteristici elementi elastici di richiamo in grado di creare un campo di forze "centripeto antigravitario" che annulla i movimenti a scatto, smorza le oscillazioni indesiderate e riporta la pedana sempre in piano. È inoltre fornita di dispositivi di regolazione indipendenti del precarico degli elementi elastici, variabili in base al peso del bambino e alle caratteristiche del training richiesto [4].

METODI

Abbiamo selezionato un campione omogeneo di n.14 bambini con danno cerebrale da causa acquisita e deficit nel bilanciamento posturale in posizione seduta. Abbiamo assegnato i candidati rispondenti ai criteri di inclusione secondo l'ingresso a ricovero progressivamente e in maniera alternata a ciascuno dei due gruppi: Gruppo 1 –"MMP" è stato trattato con pedana oscillante, Gruppo 2 – "Controllo" è stato trattato con trattamento neuromotorio tradizionale.

La valutazione dei dati obiettivi è stata eseguita usato le seguenti scale:

— **GOS - The Glasgow Outcome Scale** scala per la quantificazione delle capacità funzionali residue.

— **LCF - Levels of Cognitive Functioning** scala di valutazione del livello di recupero cognitivo post coma.

— **DRS - Disability Rating Scale** Scala per la misurazione della disabilità cognitivo-comportamentale.

La valutazione della posizione seduta è stata eseguita con i seguenti test:

— Per la valutazione quantitativa dei tempi di mantenimento della posizione seduta abbiamo usato la GMFM (Gross Motor Function Measure) dimension B – sitting position.

— Per l'analisi qualitativa della posizione seduta la SACND (Sitting Assessment for Children with Neuromotor Dysfunction scala specifica per la valutazione della posizione seduta per i b. con disturbi neuromotori [5].

— Il criterio di inclusione e di inizio training rispetto alla data di insorgenza del trauma è stato:

— b. con un minimo di contatto e partecipazione equivalente al punteggio 3 della scala LCF.

— b. con un controllo della posizione seduta inferiore ai 3 sec.

Il training è stato proposto fino a quando i b. non avessero raggiunto il controllo della posizione seduta con appoggio plantare per un tempo superiore ai 10 sec.

Trattamento

I bambini del Gruppo di Controllo hanno eseguito un training neuromotorio intensivo tradizionale di 2 ore per 5 giorni alla settimana. I bambini del Gruppo MMP, all'interno di un trattamento neuromotorio intensivo di 2 ore per 5 giorni alla settimana, sono stati sottoposti a un training di 45 minuti 5 giorni a settimana con pedana oscillante. Il training è stato calibrato secondo le competenze e le caratteristiche specifiche del singolo soggetto, con un livello di complessità a difficoltà crescente. L'obiettivo del training è stato mirato ad incrementare le abilità e l'adattabilità posturale del distretti capo-tronco-.a.s mediante le seguenti variabili: 1) posizione; 2) presa; 3) calibrazione molle; 4) compiti; 5) perturbazioni. (Tabelle I e II)

RISULTATI

Tutti i pazienti selezionati al momento dell'arruolamento avevano una GOS di 2, una LCF di 3 e un DRS tra 19 e 23. (Tabella III)

Tutti i b. di entrambi i gruppi raggiungono la posizione seduta autonoma (item 34 - GMFM mantengono la posizione seduta con appoggio plantare 10 sec.). I b. trattati con pedana MMP riportano un punteggio maggiore nello stesso item: mantengono la posizione seduta senza il sostegno di mani e piedi anche per tempi superiori ai 10 sec.

I b. del gruppo MMP riportano inoltre un punteggio maggiore per l'item - Bilanciamento del Sacnd Mantenimento, ottenendo un punteggio pari ad 1: (spostano il carico e riescono a riportasi stabilmente sulla linea mediana senza il supporto delle mani).

Infine i risultati mostrano una marcata differenza tra i 2 gruppi

Tabella I.—*Pazienti dello Studio*

	Età	Diagnosi	Data di nascita	Data di insorgenza	Inizio training	Fine training	Durata training
Gruppo 1 MMP							
1)E.C.	3	Stroke/SEU	03/10/08	19/11/10	01/03/11	10/05/11	10 set
2)V.O.	8	Craniofaring.	12/07/03	07/07/10	03/03/11	19/05/11	11 set
3)C.A.	12	TC-Severo	26/08/98	19/06/10	28/09/10	09/11/10	6 set
4)B.P.	9	TC-Severo	31/07/10	24/02/10	10/06/10	05/08/10	8 set
5)A.M	2	Stroke	09/04/09	23/06/10	12/10/11	21/12/11	10 set
6)A.C	4	TC-Severo	30/04/07	03/10/11	18/10/11	15/11/11	4 set
7)M.P	9	TC-Severo	01/12/02	19/10/11	31/10/11	19/12/11	7 set
Gruppo 2 Controllo							
1)E.G.	14	TC-Severo	30/12/96	08/09/11	27/10/11	16/02/12	16 set.
2)B.P.	7	TC-Severo	30/05/93	09/08/10	30/08/10	25/10/10	8 set.
3)E.P.	3	Encefalite	06/02/07	16/07/10	17/09/10	06/12/10	12 Set.
4)V.M.	10	TC-Severo	03/07/00	26/04/11	31/05/11	13/09/11	15 set.
5)G.P..	13	TC-Severo	03/01/98	22/11/11	07/01/12	11/04/12	14 set.
6)R.P.	14	TC-Severo	10/07/96	25/01/11	24/02/11	07/05/11	10 set.
7)M.P	9	TC-Severo	07/01/99	11/11/09	01/12/09	03/02/10	9 set.

Tabella II.—*Schema sequenza training*

	inizio	intermedio	finale
1) Posizione	Seduto	Seduto/Eretto + KAFO	Eretto + KAFO
2) Presa	Alta – al tronco	Intermedia- al bacino	Assente
3) Calibrazione Molle	Rigida a 8	Intermedia a 4	Detesa a 0
4) Compiti	Task facilitante	Task intermedio	Task complesso
5) Perturbazioni	Favorevoli	Ritmate	Sfavorenti

Tabella III.—*Tabella pre-post training.*

	Valutazione Pre training			Valutazione Post training		
	GMFM dim. B	Sacnd M	Sacnd R	GMFM dim. B	Sacnd M	Sacnd R
MMP						
1)E.C.	25	16	16	51,6	10	16
2)V.O.	33,3	16	16	58,3	7	6
3)C.A.	11,6	16	16	76,6	6	6
4)B.P.	16,6	16	16	25	12	16
5)A.M	31,6	16	16	46,6	11	12
6)A.C	15	16	16	68,3	8	8
7)M.P	10	16	16	68,3	10	12
CONTR GROUP						
1)E.G.	15	16	16	50	11	16
2)B.P.	26,6	16	16	63,3	10	12
3)E.P.	16,6	16	16	26,6	9	12
4)V.M	13,3	16	16	25	12	16
5)G.P.	35	16	16	75	9	8
6)R.P.	13,3	16	16	46,6	10	12
7)T.S.	30	16	16	66,6	8	8

per quanto riguarda la durata del training in relazione ai tempi di acquisizione della posizione seduta.

DISCUSSIONE

Gli articoli esistenti in letteratura centrano la loro attenzione sul bilanciamento della stazione eretta maggiormente per post traumatici di natura media (mild TBI) riportando come dopo numerose settimane post trauma (12 sett.) i bambini continuano ad avere specifici disturbi di bilanciamento posturale [2] Le percentuali per gli adulti con TBI severo dicono che oltre 80% riporta conseguenti deficit motori relativi a alterazioni del tono muscolare, nel timing di reclutamento, e alterazioni sensoriale con implicazioni nel controllo della stabilità e orientamento posturale. [1]

Tuttavia nessun lavoro è presente in letteratura per quanto riguarda la valutazione, le modalità e i tempi di trattamento per bambini TBI gravi con disturbi specifici nel controllo della posizione seduta: il nostro lavoro vuole appunto tentare di colmare questa lacuna.

Molto esiste in letteratura invece riguardo il trattamento dei disturbi di bilanciamento mediante l'utilizzo di perturbazioni in bambini con PCI [6] mentre per il bilanciamento posturale della posizione seduta è presente per altre patologie di natura differente [7] ma non per i TBI gravi.

Nel nostro lavoro tutti i 14 bambini raggiungono il controllo della postura seduta ma di particolare interesse risulta che i tempi medi relativi all'acquisizione di questo target del Gruppo MMP sono di 1/3 inferiori al Gruppo di Controllo.

CONCLUSIONI

Tutti i b. trattati con il training specifico di bilanciamento posturale raggiungono una piena autonomia della posizione seduta consistentemente prima del gruppo di controllo.

I dati raccolti appartengono ad un campione troppo ridotto per una significatività statistica per cui abbiamo considerato di ampliare il campione.

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Normocalcemic primary hyperparathyroidism in rehabilitation unit

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Primary hyperparathyroidism (PHPT) is a disease characterized by elevated or inappropriately normal parathyroid hormone (PTH) levels due to excessive secretion by one or more parathyroid glands. The classical form of the disease is characterized by hypercalcemia, high PTH level, kidney stones and severe bone disease [1]. With the advent of new technology in PTH dosage, the classic presentation of primary hyperparathyroidism with hypercalcemia is not always present. The Third International Workshop on the Management of Asymptomatic Primary Hyperparathyroidism described the entity of normocalcemic primary hyperparathyroidism (NPHPT) in which the serum calcium is normal but the serum PTH is elevated, in the absence of any secondary cause for PTH elevation [2]. The demonstration of normocalcemic PHPT is more difficult because there are no guidelines for routine PTH measurement. So, NPHPT is frequently identified during the investigation of reduced bone density or kidney problems. In this study we wanted evaluate the prevalence of Normocalcemic Hyperparathyroidism in patients admitted to our rehabilitation unit (Habilita-Hospital of Sarnico, Bergamo) for fracture or for osteoporosis.

MATERIALS AND METHODS

We studied 187 patients admitted to Habilita Hospital of Sarnico (Bergamo) for fracture or for osteoporosis from January 2010 to December 2010. At admission we examined the level of serum calcium, phosphate, intact PTH, vitamin D, albumin and creatinin. Patients functional outcome was assessed by the Barthel index Score. Calcium concentration was corrected for serum albumin. The correction of serum calcium levels in relation to albumin was performed using the following formula: corrected calcium = calcium found + (4-serum albumin) × 0.8. Serum intact PTH was determined using the Advia Centaur (range 12-72 pg/ml). Serum vitamin D using HPLC CHROMSYSTEMS (range10-20 mcg/L). The diagnostic criteria for NPHPT were as follows: apart from normal serum calcium and high PTH levels, serum 25OHD levels above 10 mcg/L, absence of bisphosphonates, thiazide diuretics, anticonvulsants or lithium use, normal glomerular filtration rate and the absence of other metabolic bone diseases or gastrointestinal diseases associated with malabsorption or liver disease.

RESULTS

Baseline characteristics are shown in Table I. In 187 patients recovered for osteoporosis or fracture in our rehabilitation unit, we found 42 subjects (23%) with hyperparathyroidism. Of these patients, 36 (85%) presented secondary hyperparathyroidism. 6 (15%) presented primary hyperparathyroidism. Secondary hyperparathyroidism was due to chronic renal failure (44%) and vitamin D deficiency (56%). All patients with primary hyperparathyroidism were normocalcemic. Of these patients with normocalcemic primary hyperparathyroidism, 5 presented osteoporosis (83%), and one pelvis fracture.

DISCUSSION

Our results indicate that about 23% of fractured and osteoporotic patients had hyperparathyroidism, suggesting that this condition may be closely associated with fracture or osteoporosis in elderly people [3]. The deficiency vitamin D is largely present in secondary hyperparathyroidism as reported in the literature [4]. In our experience we found that all the subjects with primary hyperparathyroidism were normocalcemic so the plasmatic calcemia is not enough to exclude hyperparathyroidism. For this reason, we suggest to include PTH level in evaluation of osteoporosis and fractures even if the serum calcium is within normal limit.

On the present study we found a high prevalence of osteoporosis in NPHPT, suggesting that the normocalcemia condition does not mean that the patient is without clinical manifestations.

Controversies regarding the suggestion that NPHPT should be treated, since the disease can lead to a deterioration in bone mineral density, fractures, and kidney stones. Thus, the routine determination of PTH could detect these individuals early on in an attempt to prevent an unfavorable clinical course.

There is no consensus about when to treat patients with NPHPT, but if there is progression to clinical complications such as urolithiasis, bone mass loss, or fractures, surgery is indicated [3].

In conclusion, our findings revealed a high prevalence of osteoporosis in normocalcemic primary hyperparathyroidism. Because plasmatic calcemia is not enough to exclude hyperparathyroidism,

Table I.—*Baseline characteristic of patients*

Age	female	male	Barthel Index at admission	Admission for osteoporosis	**Admission for fracture**
78±11	157	30	52±30/100	60	127

we suggest to include PTH level in evaluation of osteoporosis and fractures even if the serum calcium is within normal limits.

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Post-acute intensive stroke rehabilitation: clinical complexity and outcome evaluation with process-outcome markers

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Hospitalization in a post-acute intensive rehabilitation unit is often characterized by several clinical events, sometime able to affect significantly the care pathway. That is even more considerable in patients with recent stroke, due to their clinical instability. This study aims to document these clinical variables, some already present at the admittance in department, in order to identify which ones might be significant for prognosis and outcome[1].

For this purpose we used a process-outcome markers system specifically identified inside the pro-ject IPER2-Liguria to describe the care pathways for patients in rehabilitation units.

MATERIALS AND METHODS

This work was carried on a large sample of patients hospitalized in the last two years in our Unit of Rehabilitation and Functional Recovery for an intensive rehabilitation program after stroke. It's a sample of 194 patients (104 males), aged between 43 and 94 years, affected by stroke: 142 had an ischemic stroke, 48 a cerebral hemorrhage, 4 had subarachnoid hemorrhage, coming almost entirely by a department for acute neurology.

IPER2 (Indicatori Percorso-Esito in Riabilitazione)[2] is a modified version of a system of general indicators and measures originally developed between 2001 and 2002. The project IPER2-Liguria, promoted by the Regional Health Agency, has the aim to describe the clinical complexity of patients in rehabilitation units and to define the outcome at the end of the treatment.

The general indicators used in IPER2 (Fig. 1) are grouped into four logical subsets: pre-morbid history, status indicators, transition indicators and outcome indicators.

Pre-morbid history: were the previous chronically diseases (prevalent comorbidities), stratified into two levels: SEVERE ORGANIC SISTEM FAILURE and CRONIC COMPLEXITY (presence of at least two diseases which need long term therapy). *Status Indicators*: they define the clinical and functional patient's profile at admittance in department and at discharge. They are distint in Clinical Complexity items, medical and nursing, and Functional Dependency items.

Transition indicators: they include significant events (in particular the so-called "sentinel events") that occurred during hospitalization, which needed therapeutic-nursing relevant interventions.

Outcome indicators: used to document the outcome of the rehabilitation process.

General measures include:

- *pre-morbid functional status*, expressed with two scales: the modified *Rankin scale*, utilized to classify the degree of disability or dependence and Barthel index, which measures disability in basic activities of daily life (score from 0 to 100 = complete independence)
- *functional status* at admittance and at discharge (Barthel Index)
- *cognitive state* at admission (Mini Mental Test)

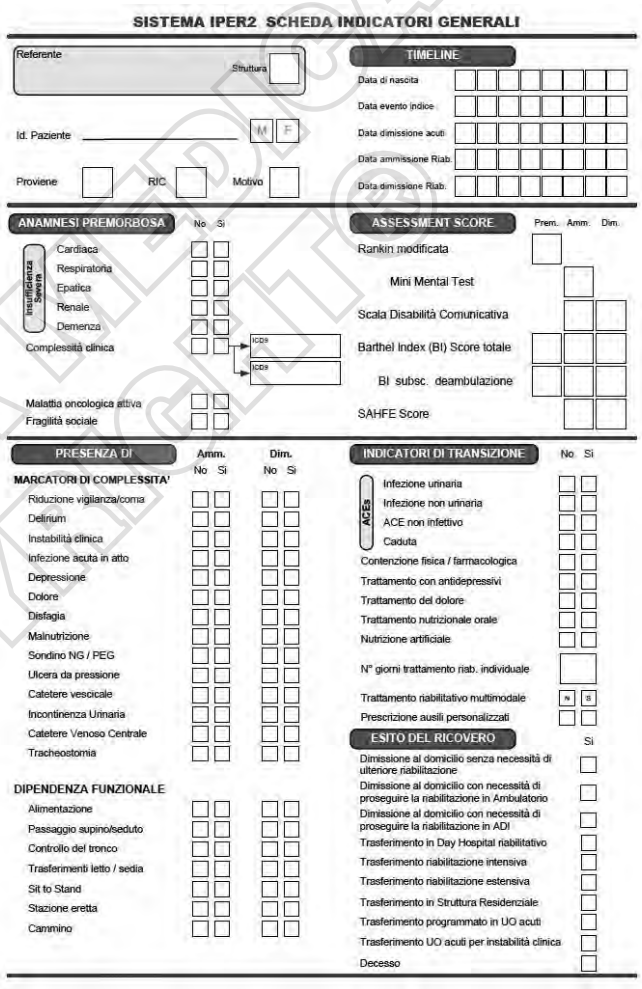

Figure 1.—General indicators.

The system IPER2, in addition to general indicators, uses others more specific, especially for the evaluation of stroke: Glasgow Coma Scale (score 3-15), Trunk control test (score 0 - 100), Motricity index, Token test for aphasia (score 0-5), Test of "cancellation" for "neglect"(score 0-54).

The motor performance at discharge is measured with two tests: Timed Up & Go test and 6MWT (6 minutes walking test).

RESULTS

Pre-morbid anamnesis: 39 patients had one kind at least of "serious organic insufficiency" (the most frequent of cardiac kind) and 151 had some comorbidity (prevalently diabetes mellitus, arterious hypertension and atrial fibrillation).

Pre-morbid Barthel Index modified (B.I.M.) (on average): 93.

Pre- morbid "deambulation" B.I.M. (specific sub-set 0-15 points) (on average): 12.

Mini Mental State at admittance (on average): 25/30.

At admittance: total B.I.M. (on average): 32 (high dependence) "deambulation" B.I.M. (on average) <3.

At discharge: total B.I.M. (on average): 63 (moderate dependence) "deambulation" B.I.M. (on average) 8 (fig. 2).

Complexity markers (at admittance and at discharge): low wakefulness/coma, delirium, clinical instability, acute infection in progress, depression, pain, dysphagya, malnutrition, NG tube/PEG.

Pressure sores, bladder catheter, urinary incontinence, central venous catheter, tracheostomy.

At admittance 137 patients (70,6%) had 2 at least complexity markers (most frequent PAIN, DE-PRESSION and BLADDER CATHETER); at discharge only 61 patients had 2 complexity markers (prevalently DEPRESSION and DYSPHAGYA)

Functional dependence markers (at admittance and at discharge) in order to: supply, supine/sitting transfer, trunk control, bed/sitting transfer, sit to stand, standing, walking.

At admittance our patients had at least 5 functional dependence markers (most frequently standing and walking, while at discharge these markers were reduced to 2.

Transition markers (in order to conditions happened during hospitalization): urinary infection, non urinary infection, non infectious ACE (adverse clinical events), falls, physical or drug restraint, anti-depressant drug treatment, pain treatment, oral nutrition treatment, artificial nutrition.

During intensive rehabilitation 160 patients of our casuistry had one at least of said events: the most ricorrent was urinary infection. For 109 subjects rehabilitation training was multimodal kind (f.e. motor rehabilitation and speech rehabilitation). For 49 patiens at discharge some aid was pre-scribed.

Hospitalization outcome: 51 patients discharged with no other treatment, 38 with indication to other treatment (at home or surgery), 52 patients addressed to rehabilitation Day Hospital, 25

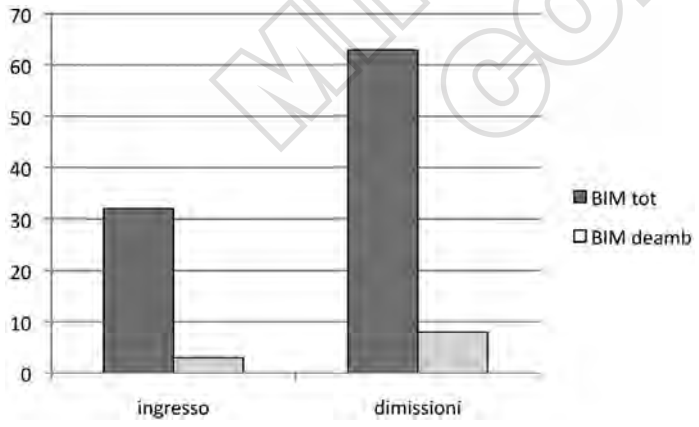

Figure 2.—Total BIM and deambulation BIM at discharge.

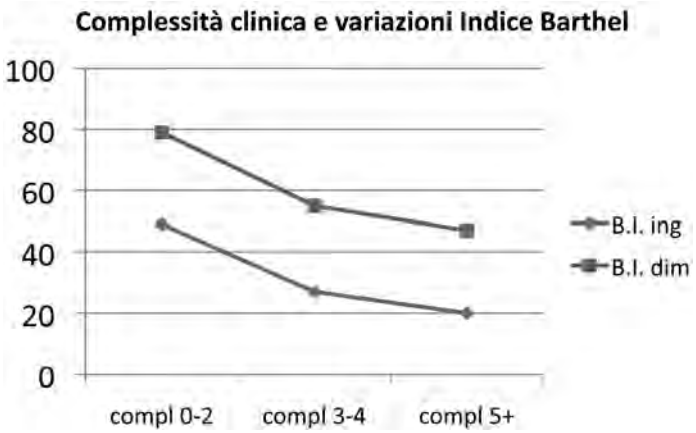

Figure 3.—Barthel Index at admittance and at discharge.

transferred in extensive rehabilitation, 6 hospitalized for clinical instability, 17 other outcomes.

DISCUSSION

All these data, togheter with direct experience on these patients care, suggest us that clinical com-plexity is the most important factor to influence outcome of stroke[3]. For supporting this thesis we have made 3 subgroup in our sample, in order to the different kind of clinical complexity at admit-tance.: first subgroup – patients with low complexity (0 – 2 complexity markers), second subgroup – patients with medium complexity (3 – 4 complexity markers), third subgroup – patients with high clinical complexity (5 and more complexity markers). We have then tried to correlate these diffe-rent complexity levels to disability degree (functional independence) of our patients, tested with Barthel Index at admittance and at discharge (fig. 3).

CONCLUSIONS

In intensive rehabilitation after stroke many clinical and functional conditions are present. Some of these, singly or togheter with others, can significantly condition recovery prognosis. Patients with high clinical complexity are the most dependent in ADL, both at admittance and at discharge. Complexity degree at admittance can be predictive for outcome. Correct consciousness of comple-xity of these subjects, of care and outcomes can allow to identify the best care pathways.

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Robot-assisted practice of gait and stair climbing in non-ambulatory stroke patients

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Restoration and improvement of independent gait are major goals of stroke rehabilitation. Task-specific repetitive approach is regarded as the most promising to restore motor function after stroke [1]. The therapeutic effort needed for relearning stair climbing after stroke is considerable, especially considering the risk of falls. Stair climbing is an integral part of mobility. [2]. [3].

To ease therapist effort, a gait robot (G-EO System by Reha Technology AG; Olten, Switzerland) was designed [4]. This gait robot enables wheelchair-bound subjects the repetitive practice of floor walking and stair climbing.

The present work presents the clinical results in non-ambulatory patients with sub-acute stroke allocated to two groups. The hypothesis was of a superior gait and stair-climbing ability in the intervention rather than the control group.

MATERIALS AND METHODS

30 patients with stroke were enrolled. The inclusion criteria were age lower than 80 years, first-time supratentorial stroke, stroke interval of less than 10 weeks before study onset, wheelchair-mobilization and partial independence in basic activities of living, ability to sit at bedside with hands holding on and feet placed on floor and able to stand for a short period, Functional Ambulation Categories (FAC) score of 1 or 2 out of 5 [5], no severe lower-limb spasticity, no severe heart disease limiting participation according to examination by cardiologist, no other neurological or orthopedic diseases, no severe cognitive or communicative impairment.

15 patients were allocated in the intervention group and 15 patients were allocated in the control group. The intervention group patients had 60 min sessions of therapy every workday for 4 weeks, totaling 20 sessions. Within the first 30 min, they practiced on the G-EO System. The net therapy time ranged from 15 to 20 min. During each session, the patients practiced up to 15 min of simulated floor walking followed by 5 to 10 min of repetitive simulated stair climbing up and down. The patients practiced a minimum of 300 steps on the simulated floor and climbed a minimum of 50 steps on the simulated stair during each session. Breaks were optional, uninterrupted training intervals of at least 5 minutes were required.

The second session of 30 minutes aimed at improving gait and stair climbing in real-life situations depending on patients' individual impairment level. A task-specific repetitive approach and tone-inhibiting maneuvers to practice the motor tasks repetitively were applied. The distance covered during walking and the numbers of steps climbed was recorded.

The control group received 60 min of physiotherapy every workday for 4 weeks, totaling 20 sessions, with the same physiotherapist as the intervention group. Again, restoration and improvement of gait and stair climbing by applying a task-specific repetitive approach in conjunction with tone-inhibiting maneuvers was emphasized. The distance covered during walking and the numbers of steps climbed was also recorded.

The primary variable was the FAC, including climbing up and down one flight of stairs in an alternate or non alternate pattern (technical aids and a bilateral handrail could be used) [5].

Secondary variables were the Rivermead Mobility Index (RMI) [6]; the 10 m test to assess the mean velocity (any applied technical aids were kept constant); the lower-limb Motricity Index (MI), which tested the muscle strength of ankle dorsiflexion, knee extension, and hip flexion [7]; and lower-limb muscle tone of five passive movements (ankle dorsiflexion, ankle eversion, knee flexion and extension, and hip flexion) were tested while the patient laid supine by the lower-limb Resistance to Passive Movement Scale of 0 to 20 [8].

Two blinded therapists assessed patients at study entry (T0), after 2 weeks (T2), after 4 weeks (T4), and at follow-up (TF), 3 months after study end.

RESULTS

The demographic and clinical data of the two patient groups at study onset did not differ. All but one intervention group patient completed the study. The intervention group patients practiced more intensively, the numbers of stairs climbed differed in favor of the intervention group.

During the intervention, the intervention group patients improved to a larger extent FAC, gait velocity, RMI, and MI. During follow-up, the superior effect in favor of the experimental group persisted for the FAC and the MI, whereas gait velocity and the RMI did not differ.

At the end of the study, seven experimental group patients and one control group patient regained the ability to climb up and down at least one flight of stairs independently (FAC score of 5). At follow-up, 11 experimental group patients and 6 control group patients had achieved an FAC score of 5.

DISCUSSION

Gait and stair-climbing ability improved to a significantly larger extent in the intervention group compared with the control group.

At the end of the 4-week intervention, seven intervention group patients but only one control group patient reached the FAC score of 5, indicating both, independent gait and the ability to climb stairs. At follow-up, the superior gait and stair climbing ability in the intervention group persisted.

Groups, absolute treatment times, and the remaining rehabilitation program were comparable at study onset. Accordingly, the higher gait and stair climbing intensity probably explained the final superior result of the intervention group. This difference is explained by the G-EO System enabling a higher intensity of stair climbing practice. The combination of robotic and traditional physiotherapy in the intervention group resulted in a faster restoration of gait, thus reducing the effort for the patients and their therapists on real stairs.

Numerous stroke studies have shown the obvious correlation between intensity of gait practice and the mobility outcome, be it in terms of additional locomotor training, treadmill training with BWS, or gait machines [9]. Intense locomotor training resulted in improved cardiovascular fitness in patients with sub-acute [10] and chronic [11] stroke.

CONCLUSIONS

The novel G-EO System robot offers non-ambulatory patients after a stroke the ability to practice repetitively simulated floor walking and stair climbing. Because of the higher training intensity, the intervention group patients reached a superior gait and stair climbing ability at treatment end and follow-up. At present, no definite conclusions on the G-EO System's effectiveness are warranted and a robust randomized controlled trial should follow.

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Furlong hip arthroplasty: functional 7-year follow-up

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In the last years the number of hip arthroplasties is constantly increased, and an incessant growing demand is expected for the next decades[1]. Considering the increased life expectancy for elderly patients and a larger extension of surgical indications in younger adults, the need for an appropriate implant choice is now emphasized[1]. Long-term survival implants which can satisfy current patients' high physical demands are required. Thus, in order to avoid high revision rates of cemented implants described for young and active patients, orthopaedic surgeons' attention has been focusing on materials used for primary (mechanical) and secondary stability (osteo-integration of components) through the concept of "biological fixation"[2,3]. The process of bonding osteogenesis in prosthesis using biological fixation could enable a stability which resembles permanent physiological union after fractures in healthy cancellous bone[4]. Hydroxyapatite coating on femoral component of uncemented total hip arthroplasty was proposed on the basis of its biocompatibility and osteoconductive properties[5]. The aim of this work was to analyze clinical and functional long-term outcomes in patients receiving hip replacement with biological fixation.

MATERIALS AND METHODS

205 total hip replacements (THRs) performed in 182 patients between January 2000 and June 2006 at the Azienda Ospedaliera of Verona were followed up prospectively. Indication for THR was primary coxarthrosis in 132 cases, necrosis of the femoral head in 30 cases, congenital hip dysplasia in 28, arthritis due to rheumatic diseases in 13, joint stiffness due to chondrolysis with epiphysiolysis in 2. 23 (12.6%) patients had bilateral procedures. All patients received the Furlong® prosthesis: a ceramic-coated acetabular cup, with the addition of cancellous screws and a straight stem coated with hydroxyapatite ceramic**.** All THRs were performed by the same surgical team during elective procedures. All patients received antibiotic cover with teicoplanin, and routine anti-thromboembolic prophylaxis with Low Molecular Weight Heparin, and compression of the leg with an elastic stocking. Each patient received the same rehabilitative treatment by a single rehabilitative team at the Orthopaedic Rehabilitation Department of the University of Verona, in Valeggio sul Mincio (Verona). Muscular stretching and joint mobilisation were started soon after surgery. Immediate weight-bearing was encouraged following a sequence of progressive weights in the subsequent weeks. All patients were assessed before surgery (T0), at 3 months (T1), 6 months (T2), and 1 year after surgery (T3), and thereafter annually for 7 years (T4, T5, T6, T7, T8, T9). Harris Hip Score (HHS) was used for clinical and functional evaluation: mean values of HHS were rated in our series of patients, and in patients grouped by sex, age, BMI, operated side (dominant or controlateral side), and indication for THR. Radiographic signs of calcification, subdivided into 5 stages[6] were examined. Number and type of complications were recorded. Statistical analyses were performed using SPSS for Windows (SPSS Inc, USA). A p-value <0.05 was considered to be significant.

RESULTS

Demographic data are reported in Table I. There were 22 cases (10.73%) of drop-out: 11 patients (5.36%) died from unrelated causes by a minimum of 1 to a maximum of 6 years after surgery, 5 (2.44%) had revision procedures, and 6 (2.93%) patients were lost to follow-up due to change of address and telephone number. Mean HHS value showed an improving statistically significant trend (Figure 1). This positive trend was maintained in all groups of patients according sex, age, pathology, operated side, and BMI. Comparisons between men and women showed no significant differences before surgery (Figure 2). A significant difference appeared at 3 and 6 months after surgery, with better results for men. No significant differences were found at later assessments. Patients with diagnosis of primary coxarthosis showed a significant negative difference compared to patients treated for displasia, necrosis, and arthritis (Figure 3). Patients older than 70 years had a worse

Table I.—*Demographic data.*

CHARACTERISTICS	MEAN VALUES+SD
Age at surgery (years)	60.5 years (range 13-87) ± 16
Age in Females (years)	60.8 ± 16.8
Age in Males (years)	60 ± 14.3
Mean BMI	27 ± 4.4
BMI in Females	26.3 ± 4.4
BMI in Males	28.2 ± 4.2
CHARACTERISTICS	**NUMBER OF HIPS**
Males	78
Females	127
16-45 years of age	32
46-60 years of age	47
61-70 years of age	69
>70 years of age	57
Normal weight (BMI<25)	74
Overweight (BMI 25-30)	94
Type 1 obesity (BMI 30-35)	23
Type 2 obesity (BMI >36)	14
Dominant side	124
Controlateral side	81

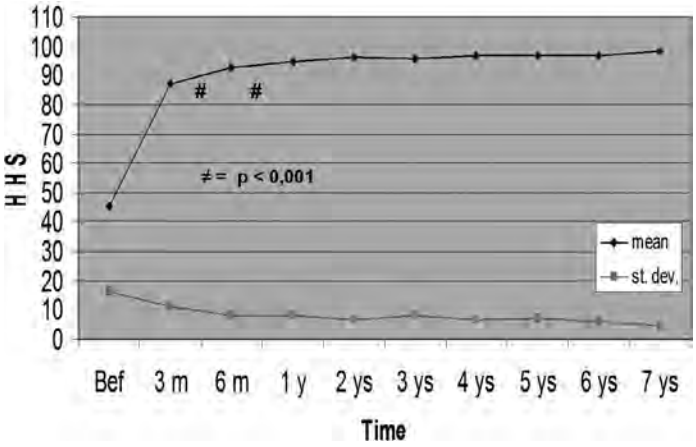

Figure 1.—Mean HHS results.

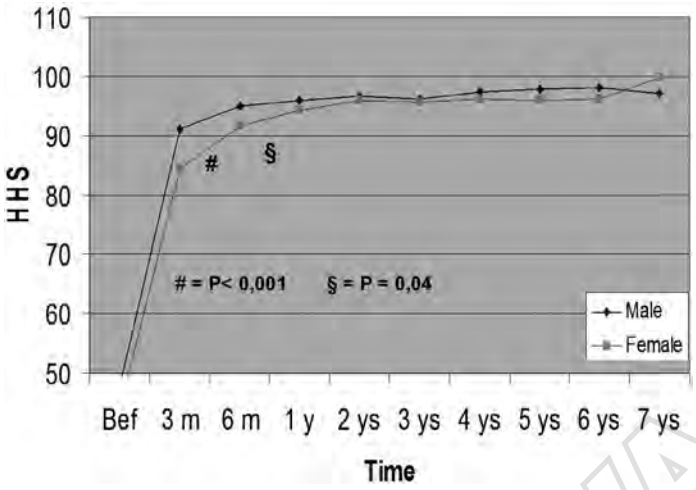

Figure 2.—HHS results in patients grouped by sex.

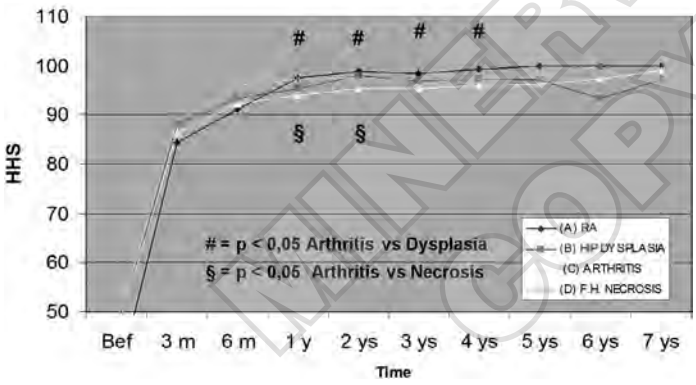

Figure 3.—HHS results in patients grouped by indication for THR.

functional recovery than the other younger groups (Figure 4). Before surgery, analysis of variance did not show significant differences in the 4 groups of patients classified on the basis of weight. A very significant difference appeared 3 months after surgery. Significant differences were found between normal-weight patients and types 1 and 2 obese patients, and between the two types of obesity. Furthermore, a significant difference was found between normal and overweight patients (Figure 5). No significant differences were found comparing the dominant or contralateral operated side, and analyzing patients subdivided by degree of periarticular calcification. We found 25 complications (12.19%). The 19 early complications (9.26%) included: 7 cases of deep vein thrombosis (3.41%); 3 cases of transitory palsy of the femoral nerve (1.46%); 5 disphyseal fractures of the femur during surgery (2.43%); 4 dislocations of

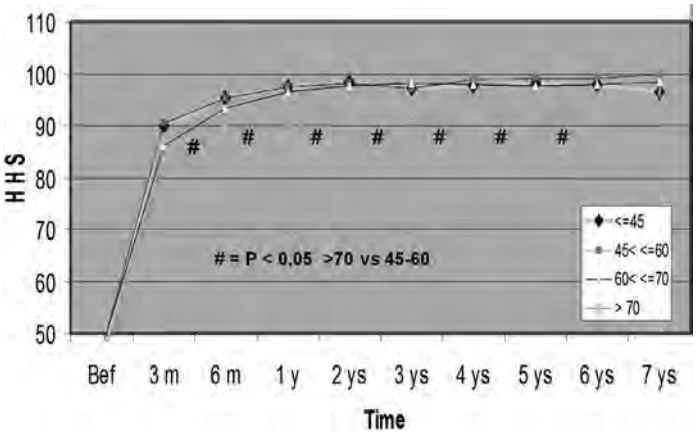

Figure 4.—HHS results in patients grouped by age.

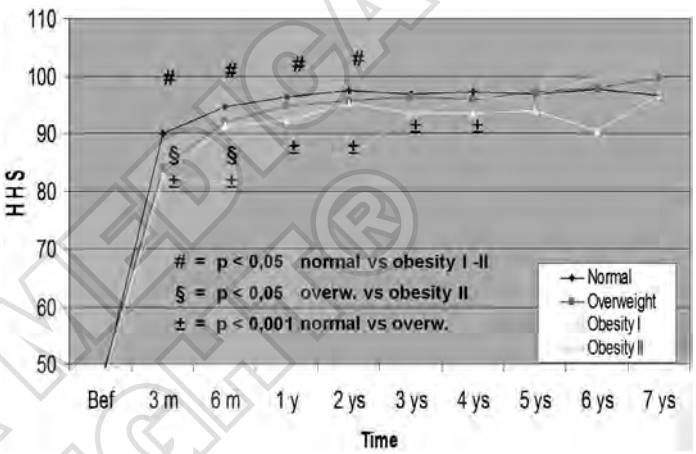

Figure 5.—HHS results in patients grouped by BMI.

the prosthesis (1.95%). The 6 late (2,93%) complications included: 2 cases of loosening of the acetabular cup (0.97%); 1 case of cup migration (0.48%); 1 loosening of the prosthesis after a diaphyseal fracture (0.48%); 1 breakage of the prosthetic head (0.48%); 1 case of painful prosthesis (0.48%). Each complication was successfully treated by means of a specific approach.

DISCUSSION

The results of our study agree with previous data reporting medium- and long-term high survival rates of the femoral component and excellent outcome, both in elderly and in young patients[7,8,9,10,11]. Furthermore, we analyzed data considering population characteristics: sex, age, BMI, operated side, and indication for THR. Men showed a more favorable outcome soon after surgery, but no differences were found at later assessments with respect to women, suggesting that men make a faster but not necessarily better recovery. Patients with diagnosis of primary coxarthrosis showed a slower recovery up to 4 years after surgery. Patients older than 70 years had a worse functional outcome than younger patients. Weight had a negative effect on functional recovery in the first 2 years after surgery, but inter-group differences progressively decreased thereafter.

CONCLUSIONS

Hip replacement with biological fixation is a reliable and reproducible surgical technique, which can be performed with excellent

functional results both in young patients with severe secondary hip arthrosis and in elderly patients. Excellent HHS results 3 and 6 months after surgery, and the long-term data stability confirm that the surgical and rehabilitation choices were correct. The 7-year satisfactory results, the low rate of cup loosening and no cases of stem mobilization show that Furlong original design and biological fixation ensure long-lasting arthroplasty stability in both elderly and young patients.

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Influence of a short preoperative exercise program on patient's outcome and length of stay after hip arthroplasty. Do we need a different organizational model?

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Osteoarthritis in Italy is a common cause of disability and hip is one of the more affected joints. Many studies are carried out to increase knowledge about this disease [1] in order to achieve conservative therapies, but when conservative methods are not effective any more, surgical approach may be considered. Even if the effectiveness of rehabilitation programs after hip replacement surgery has been studied and well accepted from literature [2], there is controversial evidence about the efficacy of a preoperative education on patient's outcome after total hip arthroplasty.[3] A reduction of hospital length-of-stay (LOS) is reported about those patients which underwent a preoperative rehabilitation program[4]. The experience in foreign countries shows the possibility of actuating fast-track setups with functional discharge criteria[5] in order to achieve shorter LOS, thus saving resources of health systems. Aim of this study was to test the feasibility and efficacy of a two-weeks preoperative physiotherapy, in order to reduce patient's LOS and disability after hip total arthroplasty.

MATERIALS AND METHODS

A first group (G1) of 15 patients were consecutively recruited among the candidates for hip replacement surgery and a preoperatory exercise program was carried out. G1 inclusion criteria: patients resident in the hospital geographical area, with age ranging between 59 and 79 years, suffering from symptomatic osteoarthritis from at least 8 months but not exceeding 18 months, without concomitant neurological disease, being able to give informed consent. The G1 group had a mean age of 70.8 years and had been suffering hip pain for an average of 8 months. After hip replacement surgery, patients were started with a rehabilitation program, as inpatients in our Rehabilitation Unit. A control group of 15 subjects (G2) was recruited among the patients consecutively admitted to our Rehabilitation Unit after total hip replacement, having same inclusion criteria as G1, except for residency in the hospital area, having not undergone a pre-operative exercise program. G2 group had an average age of 71.4 years, with painful symptoms from hip arthritis dating from an average of 8.5 months. All patients gave their informed consent as approved by the local ethical committee. At the beginning and at the end of the G1 group pre-operatory treatment, the following evaluation tests were performed:

1) Objective examination of the lower limb, to assess hip range of motion (ROM) and British Medical Research Council (BMRC)-measured strength of the following muscles: ileopsoas, quadriceps, gluteus maximus, hip abductors, hamstring.
2) Pain assessment, using visual analogue scale[6] (VAS).
3) Hip function, using Mayo scale[7].
4) Transfer ability, using the Timed Get Up and Go test[8].
5) Gait analysis, using a computerized force platform.
6) Walking speed, using a 30-meters walking test (30WT).
7) Overall disability, using Functional Independence Measure scale (FIM), italian translation[9].

On hospital admission after hip surgery, both groups of patients G1 and G2 underwent the same assessments as above, with the exception of Timed Get Up and Go test, Gait analysis and 30WT. At discharge from the hospital both groups of patients underwent the same assessments as at hospital admission plus Timed Get Up and Go test, Gait analysis and 30WT. The patient started post-operative treatment as inpatients of our Department of Rehabilitation and Functional Recovery 5 days after surgical intervention. During the first week, the post-operative physical therapy consisted of stretching and strengthening exercises aiming to hip ROM recovery and muscles strengthening. A cane-assisted walking training was started in the first week, with progression of the treatment in the second week to improve patient's ability in self-care and walking with aids. Data were analyzed using paired t-test, one-way ANOVA and post-hoc Neumann-Keuls Multiple Comparison Test; $p<0.05$ was considered for significance.

RESULTS

After the preoperative exercise program G1 patients showed a significant improvement of hip ROM and muscle strength. After the rehabilitation program at discharge from the hospital, both groups of patients achieved a good recovery of hip ROM and muscle strength, with no significant differences. (Fig. 1) Pain assessed by VAS in both groups showed no significant difference on admission and discharge from hospital, so did the hip function, based on MAYO scale average score (Fig. 2). Step width at discharge showed no significant difference between the two groups, while step length showed a statistically significant difference for G1 group ($p<0.01$). Walking speed was not statistically different at discharge between G1 and G2 groups (Fig. 3). G1 group also showed a better performance in transfer time (Timed Get Up and Go test) with statistically significant difference ($p<0.03$), while FIM score at discharge was not statistically different between the two groups of patients (Fig. 4). G1 group showed a shorter LOS by 0.3 days, without significant difference compared to G2 group.

DISCUSSION

One objective of this study was to investigate the feasibility of a short-term pre-operative physiotherapy treatment in patients un-

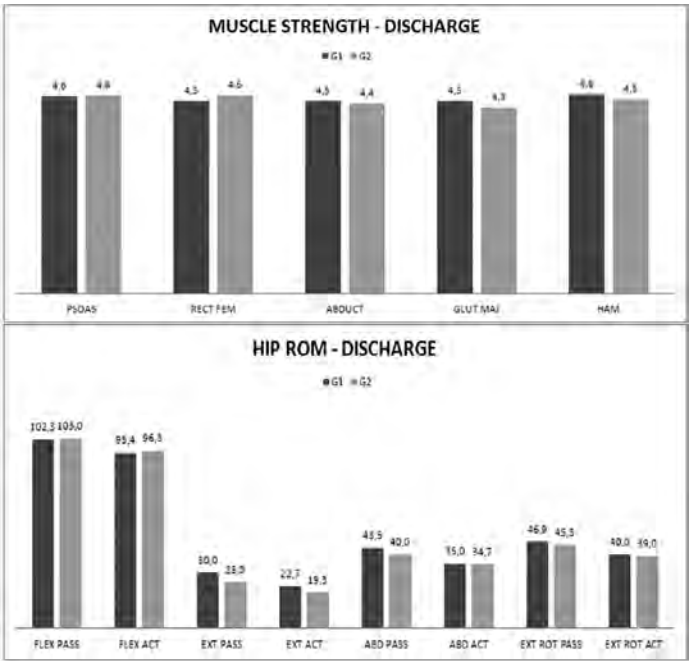

Figure 1.—Muscle strength and hip ROM at discharge.
RECT FEM, Rectus femoris ABDUCT, Abductors GLUT MAJ, Gluteus major HAM, hamstring FLEX, Flexion EXT, Estension ABD, Abduction EXT ROT, Esternal rotation PASS, passive ACT, active Muscle strenght is expressed using British Medical research Council scoring system. Hip range of motion (ROM) is expressed as degrees.

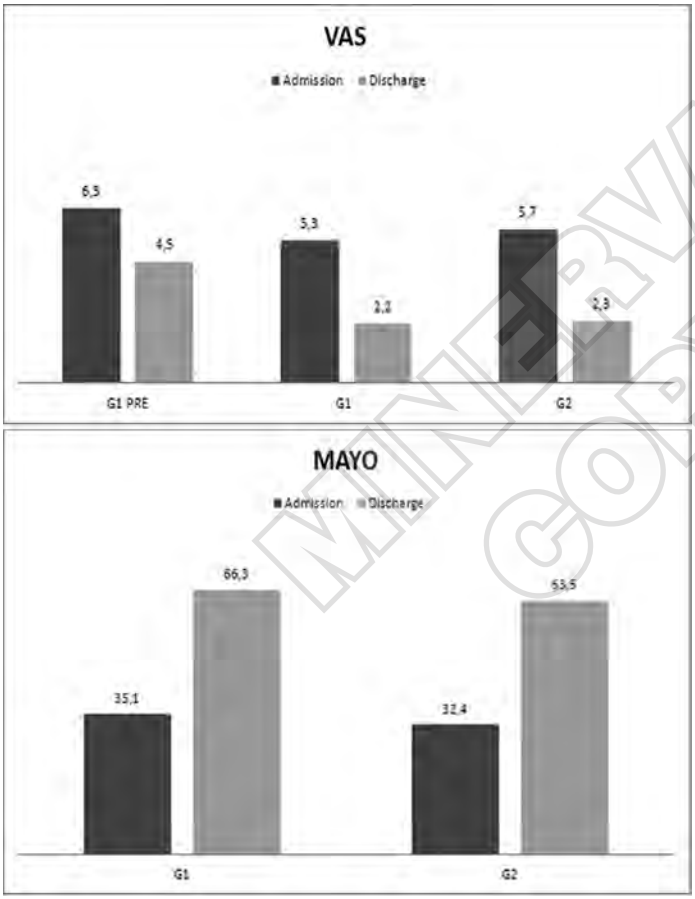

Figure 2.—VAS and MAYO Scale for hip function.
All values are expressed as scale score.

dergoing total hip replacement. No major organizational problem was reported in treatments scheduling and administering and the patients perceived it as a good service given from the hospital. An-

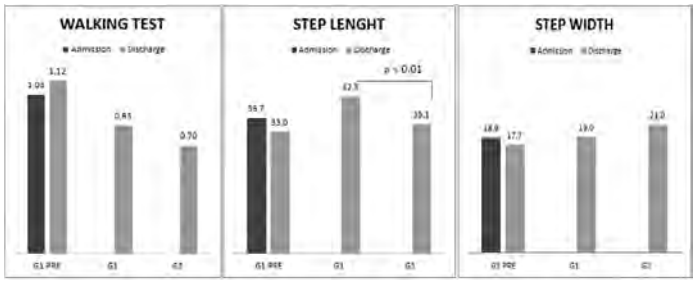

Figure 3.—Walking test, step length and step width measured preoperatively.
G1 PRE, G1 pre-operatory treatment. Walking test values are expressed as meter/second; step lenght width are expressed as centimeters.

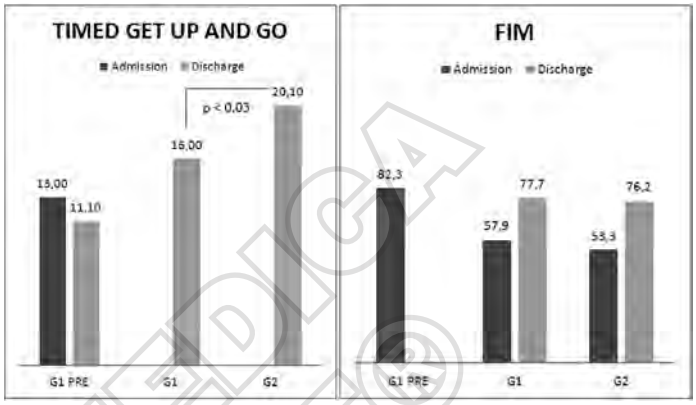

Figure 4.—Timed get up and go and FIM.
G1 PRE, G1 pre-operatory treatment. Timed Get up and Go values are expressed as seconds; FIM, Functional Indipendence Measure scale.

other aim of this study was to verify if a short-term preoperative program had some effectiveness on patient's outcome and we found that after the rehabilitation program both groups of patients had an adequate ROM and strength recovery, a similar degree of pain and a substantially equivalent hip function on discharge from hospital. Patients who underwent a pre-operative treatment showed better step characteristics, but overall walking speed was found without significant differences between the two groups of patients. Patients who carried out the pre-prosthetic treatment showed better skills in the transfer time, but the measurement of global disability by FIM scale showed no differences between the two groups at discharge. Those results lead to the conclusion that the organizational effort carried out to implement the short-term preoperative treatment has no correspondence in an adequate patient's functional improvement. Those data substantially confirm other findings, according to literature.

Keeping into account patient's LOS shortness in foreign countries when compared to our Country, the main endpoint of the study was to test the effect of the short-term preoperative treatment on our patient's LOS, hoping it could help in a significant lowering of the period of hospitalization. Even if a little improvement in LOS was achieved, no significant reduction in patient's LOS was found after a preoperative treatment. In our opinion this data highlight that rehabilitative path of our patients has few possibilities to achieve more internal efficiency when hip arthroplasty rehabilitation is performed as inpatient. The data we collected suggest that we do need a different organizational model to achieve a significant reduction of the patient's LOS for hip surgery, mainly pointing to an empowering of the rehabilitative treatment outside of the hospital, even as daily service or home treatment, when keeping the same functional milestones as for the inpatient treatment. Further studies are needed in the future to explore the feasibility of such a model in our Country, in order to save National Health System resources.

CONCLUSIONS

The administration of a short-term (two weeks) physiotherapy treatment before hip arthroplasty is feasible with few organizational effort, but it requires some resources and it presents a substantial lack of effectiveness in patient's reduction of impairment when compared to patients which did not undergo the preoperative treatment. Our results confirm literature data about a preoperative exercise program, while it was not confirmed an influence of a preoperative exercise program in reducing patient's hospital length-of-stay after total hip arthroplasty. This points to the need for a different organizational model about this rehabilitation path, maybe empowering outpatient treatment of this kind of pathology, in order to save resources of our National Health System.

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Application of robotics in daily clinical practice

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The use of robotic devices is daily practice in our center for neurological rehabilitation. Our patients mainly have diagnosis such as stroke, traumatic brain injury, Parkinson's disease, multiple sclerosis, spinal cord injury or other neurological diseases.

By the treatment of more than 700 patients in more than 17'00 therapy sessions in our robot-assisted movement center over the last 6 years some guidelines for the clinical application of robotics were established.

MATERIALS AND METHODS

Clinical observation.

RESULTS

A specialized team and the integration into a comprehensive neuro-rehabilitation concept are essential in the application of robotics. From our experience out of a long clinical practice the following guidelines have proven to be promising:

Specialization

It takes a specialized, multidisciplinary robotic team of robotics-user and non-user, which focuses on the clinical application and keeps up to date constantly by studying current literature.

Integration

Robotics should be integrated into a comprehensive neuro-rehabilitation concept and the decision on its application is made by the multidisciplinary rehabilitation team. Robotic therapy does not replace conventional therapies. The point is not whether robotics is better than e.g. physiotherapy, conventional treadmill training or any other therapies. The point is to use a robotic device during the rehabilitation process when its benefit is at an optimum for the patient's needs.

Strategy

The use of the devices allows active movement of high intensity or a high number of repetitions and provides optimal support for the patient.

Task- and goal-oriented training

The use of robotic devices is always directed to the overall objectives of neuro-rehabilitation, where the main focus lies on patient participation in daily life. The question is not: "Who is suitable for robotic devices?" but rather: "Which device is useful to achieve a certain goal?"

Training commences as early as possible

As soon as a patient is stable neurologically, as well as the cardiovascular and respiratory systems, training with robotics should start.

Robotic devices do not replace therapists

On the contrary: it really needs specialized therapists. The interaction between therapist and patient is important – exact patient observation ensures individual therapy and allows training arrangements (variations regarding e.g. duration, body weight support, use of augmented feedback, combination with gait rehabilitation exercises) according to the needs of the patient and the treatment goal.

Measurability and verification of progress

Robotic devices provide information that must be read, comprehended, and interpreted correctly.

Try and see

Implementations of robotic devices is still fairly new, constantly under development and relatively safe. Indications and contraindications must be tested time and again – and after taking safety precautions into account, it is always worth to try.

CONCLUSIONS

Robotic devices as an integral part of multidisciplinary therapies give an additional benefit for the patient and offer further promising ways for the motor rehabilitation.

Developmental Writing Disorders: understanding to rehabilitate

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Writing, considered as the result of a coding process of arbitrary and conventional graphic signs, is an important cognitive ability for school-aged children. To write properly, the child has to integrate visual and phonological information processing, in order to activate an adequate programming and coordination of motor sequences [1]. Moreover, he has to focus attention on his duty and not on other stimuli [2]. A fast increase of writing ability is reported between 6-7 years of age, with another small improvements from 9 years of age [3].

In our clinical work, we serendipitously observed an improvement in the correctness of coding in writing (orthography) after a training aiming only at improving motor aspects of writing. Therefore we decided to analyze in detail motor components of a writing precursor gesture in children with Developmental Dysorthography and/or Developmental Dysgraphia in order to point out anomalies differentiating these two disorders and to be treated with specific rehabilitative interventions.

MATERIALS AND METHODS

The aim of our work was the qualitative analysis of a writing precursor gesture in children with Developmental Learning Disorder, in order to find differences from a control group of children of the same age and school year. To this aim we studied We a sample of 25 children affected by Developmental Dysortography (ICD 9 CM: 315.09; ICD 10: F81.1) and/or Developmental Dysgraphia (ICD 9 CM: 315.2; ICD 10: F81.8) (mean age 9.1 years, range: 6.3-11.4 years). Informed consent was signed by parents or legal guardians.

First step was the administration of a neuropsychological battery including Raven Progressive Matrices [4], the Visual-Motor Integration Test [5] and the Modified Bell Cancellation Test [6].

We administered a task already used for previous research [7]. It consisted in driving a cursor through a labyrinth projected in front of the child by moving a wireless mouse on a table plane. Orientation was rightwards, to mimic writing.

The child was asked to drive the cursor out of the maze as fast as he could without touching the labyrinth's walls (FASTER condition) or to try not to "hit" the walls while running the maze (ERROR condition). These different instructions were given in random order to all children, who were therefore assessed twice, with an interval between one session and the other to prevent immediate repetition learning effect.

We assessed shoulder, elbow and wrist angles on the horizontal plane during motor tasks with a sampling rate of 125 Hz, using virtual markers generated by DartFish Pro Suite 5.0™ software and placed on specific bone landmarks.

Statistical analysis was performed using MedCalc 9.5.1™ and Statistica 7™.

RESULTS

All parameters were compared with normative data previously obtained from a sample of 226 healthy children of the same age and grade [1].

Cognitive (Raven Progressive Matrixes) and visuo-motor integration (VMI) skills didn't correlate with results obtained in our test; a deficit of visual attention (Modified Bell Cancellation Test) was instead associated with significantly poorer motor performances compared to subjects with normal attentive skills.

The statistical analysis didn't evidence significant differences regarding gesture structure (trajectories of arm segments and angular excursions of interested joints) in children with Developmental Writing Disorders. However joint range of motions and temporal execution patterns were reached in delay compared to children of the non-pathological age-matched sample under both FASTER and ERROR conditions.

We also observed that the differences observed tended to reduce in size with the increase of attended grade.

None of the parameters studied could reliably discriminate between children with Developmental Dysortography and those with Developmental Dysgraphia.

DISCUSSION

According to our data, even in subjects affected by a Developmental Writing Disorder motor strategies develop following the physiological motor development, but the process seems to slower than in typically developing children.

No differences were seen when children with Develpmental Dysgraphia were compared to those with isolated Developmental Dysortography.

CONCLUSIONS

Data obtained from this study evidence that the presence of a Developmental Writing Disorder involves a time delay in the development of motor patterns involving arm control. An adequate motor control was reached with a significant delay, thus differenti-

ating these disorders from Developmental Coordination Disorder (where patients experience a disruption of motor strategies) [8]. It is possible to speculate that the prolonged need to voluntarily control motor strategies could result in a loss of resources to be devoted to the orthographic aspect of writing, especially when visual attention is poorly developed as well. This could be a basic mechanism interfering with the process of learning how to write in children with Developmental Writing Disorders.

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Analysis of our experience in patients from the IUC in a coma, vegetative state or minimally conscious state

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Admission of patients from the ICU in a coma (1), vegetative state or minimally conscious state increased in 2011 in our intensive rehabilitation center.

An individual and personalized rehabilitation project that involved the rehabilitation team in all its components (physician, neurologist, urologist, internist, nurse, physical therapist, occupational therapist, psychologist, speech therapist) has been set for these patients, in order to get an internistic stabilization, a good prevention of complications and simultaneously groped the recovery of the maximum possible functional independence through training of caregivers in the management of disability (2).

Figure 1

MATERIALS AND METHODS

Twenty-two patients (18 men and 4 women) with altered vigilance, disorders of consciousness (GCS score scale between 4 and 8), presence of tracheostomy and O2 therapy were admitted in our study. 18 of these patients have had severe brain injury, 4 cardiovascular events.

We evaluated: Respiratory failure: it was assessed by blood gases using Phox plus device (Naos Biomedical); Body weight: patients were weighed with weighing scales with chair monthly.

Bedsores: with Norton scale; Clinical instability: the need to stop / change the rehabilitation project.

RESULTS AND DISCUSSION

At the end of the study seven patients died, thirteen were stabilized (although still in a minimally conscious state), and redirected to home or extensive rehabilitation center, two returned home with sufficient functional autonomy. In four cases it was possible to remove the tracheostomy tube and O2 therapy; in two cases the total weaning from mechanical ventilation, in two cases the removal of nasogastric tube with return to oral feeding. Total days of stay: 2992 with average length of stay: 136 days. Patients at admission had a Norton scale score (prevention of bedsores) of 7, so a high index for bedsores, the time of discharge the average score was 14, then an index of medium severity for bedsores. 196 events that required urgent medical attention and led to a slowdown / editing of rehabilitation treatment are emerged from the analysis of clinical diary; 139 of these events are due to respiratory problems (marked desaturation, hypercapnia, bronchial exacerbation..) in the other 57 events are grouped events characterized by changes in heart rate, hypotension / hypertension, anemia, bleeding, loss of body weight.

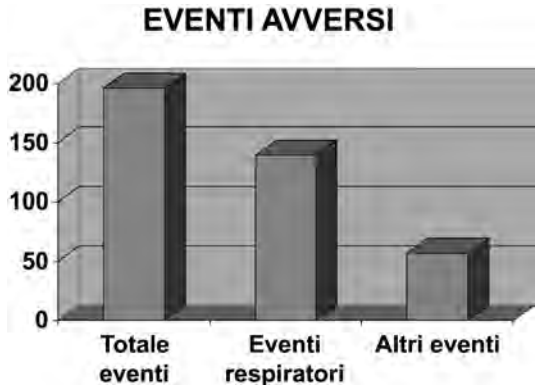

Figure 1

CONCLUSIONS

The analysis of our experience has revealed a prevalence of respiratory complications that required a change in the personalized rehabilitation project with the use of additional resources. Therefore we propose to evaluate and treat respiratory disease more strongly in patients with severe brain injury.

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Functional upper limb improvement in long-term spastic hemiparesis with multidisciplinar treatment

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Botulinum toxin type A (BoNT-A) has been reported to be an effective treatment for limb spasticity for neurological disorders [1]. A reduced muscle tone, pain relief, better hand hygiene and improved walking function were the main benefits of the treatment of spasticity with BoNT-A [2]. However, the reduction in spasticity after BoNT-A injection alone does not ensure an improvement in the active motor function of the affected limb. Moreover, functional improvement in lower limb, as can be proved on gait evaluation, has not been usually observed in upper limb function [3].

MATERIALS AND METHODS

We present the case of a 38 year-old woman, with right spastic hemiparesis caused by cerebral palsy (CP). She had always rejected any type of medical follow-up from adolescence since she had assumed her disability. We proposed her to undertake a multidisciplinary treatment at our spasticity unit in order to (with the objective to) try to improve her spastic upper limb position (Figure 1-A).

On initial physical examination, she walked with mild limping due to minimal tibialis anterior paresia, which did not require orthesis. The right upper limb showed fair mobility of the shoulder, limitation in flexion and extension of elbow, with flexum of 15º, position in flexion, pronation and ulnar deviation of wrist, flexed fingers and included thumb. Active pronosupination was minimal (5-10º). Modified Ashworth Scale was 3.

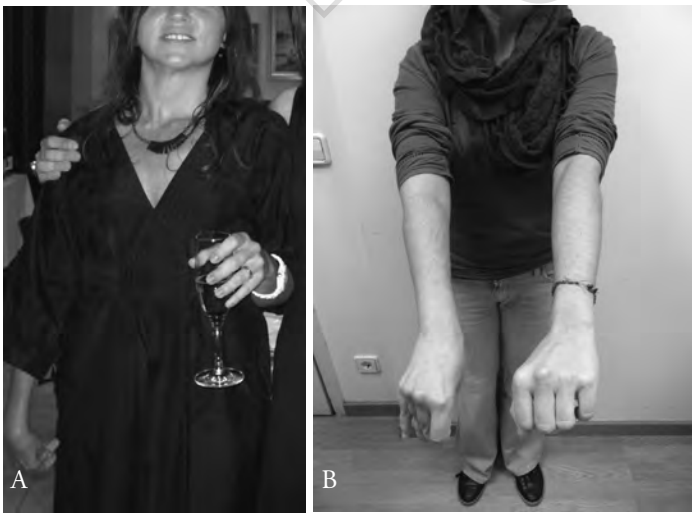

Figure 1.—A) e B).

The patient had an active working life, and used her right hand only for support. She could eventually grasp but not ungrasp.

After informed consent, the patient was treated with BoNT-A with electrical stimulation control (biceps brachii, pronator teres, flexor carpi radialis and ulnaris, superficial and deep flexor digitorum, adductor and opponent of the thumb). Treatment also included serial casting and daily occupational therapy. This last therapeutic approach was based on mirror therapy, cognoscitive therapeutic method and implementation of modified constraint therapy at home after occupational therapist instructions. This therapy involves constraining the non-affected arm to encourage performance of therapeutic tasks with the affected arm.

RESULTS

No side effects were reported for BoNT-A injections in the right upper limb. Three serial casts were placed on one week after the injections. The patient underwent occupational therapy daily for three weeks and twice a week for two months. She was instructed for home exercises [4]. After 3 months, the patient improved both upper limb position (Figure 1-B) and daily life activities such as eating, drinking and so on. She also developed her ability of grasping and ungrasping that she had never had before (Figures 2A, 2B, 3 and 4A, 4B, 4C). The initial aim of improving position was reached but an additional improvement in function was the most satisfying gain.

It should be underlined that the patient was really collaborative. Patient's satisfaction was very high, both in self-image (elbow and hand position) and in the ability to do tasks never done before with the right hand on her own.

DISCUSSION

Spasticity is defined as a velocity-dependent increase in tone and stretch reflex with exaggerated tendon jerks. Spasticity is a negative symptom which can occur following central nervous system impairment. This motor disorder can have a profound impact on health outcomes and quality of life [5]. It is associated with pain, and often has a negative impact on function, self-esteem and body image. BoNT-A represents the gold standard therapy for focal spasticity after stroke or CP, with low prevalence of complications, reversibility, and efficacy in reducing spastic hypertonia [3,5,6]. Significant improvement in spasticity with BoNT-A was demonstrated in different clinical studies

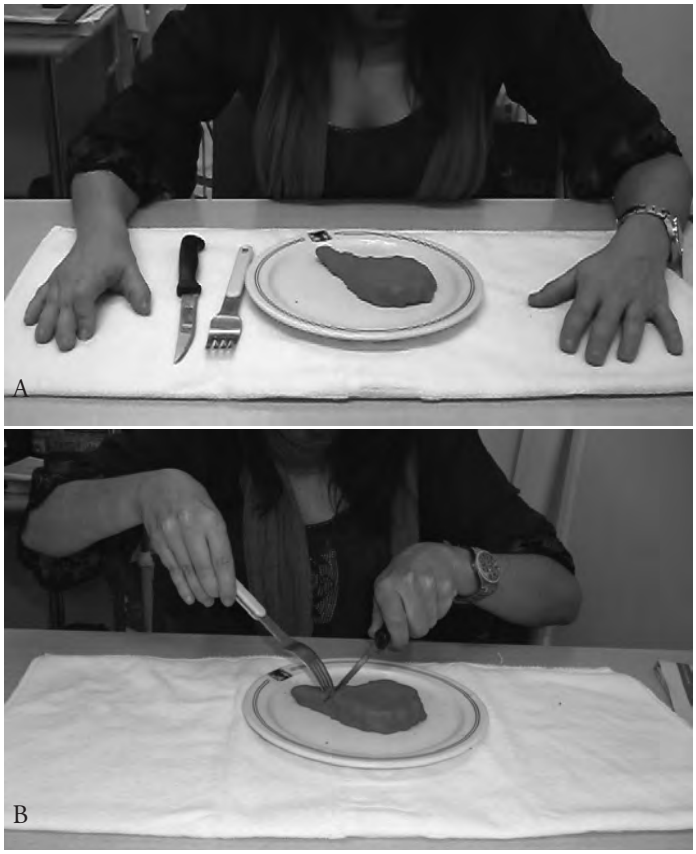

Figure 2.—A) e B).

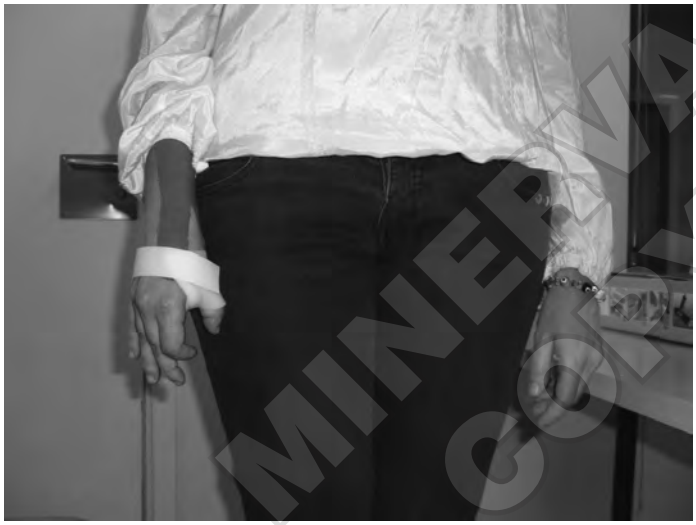

Figure 3

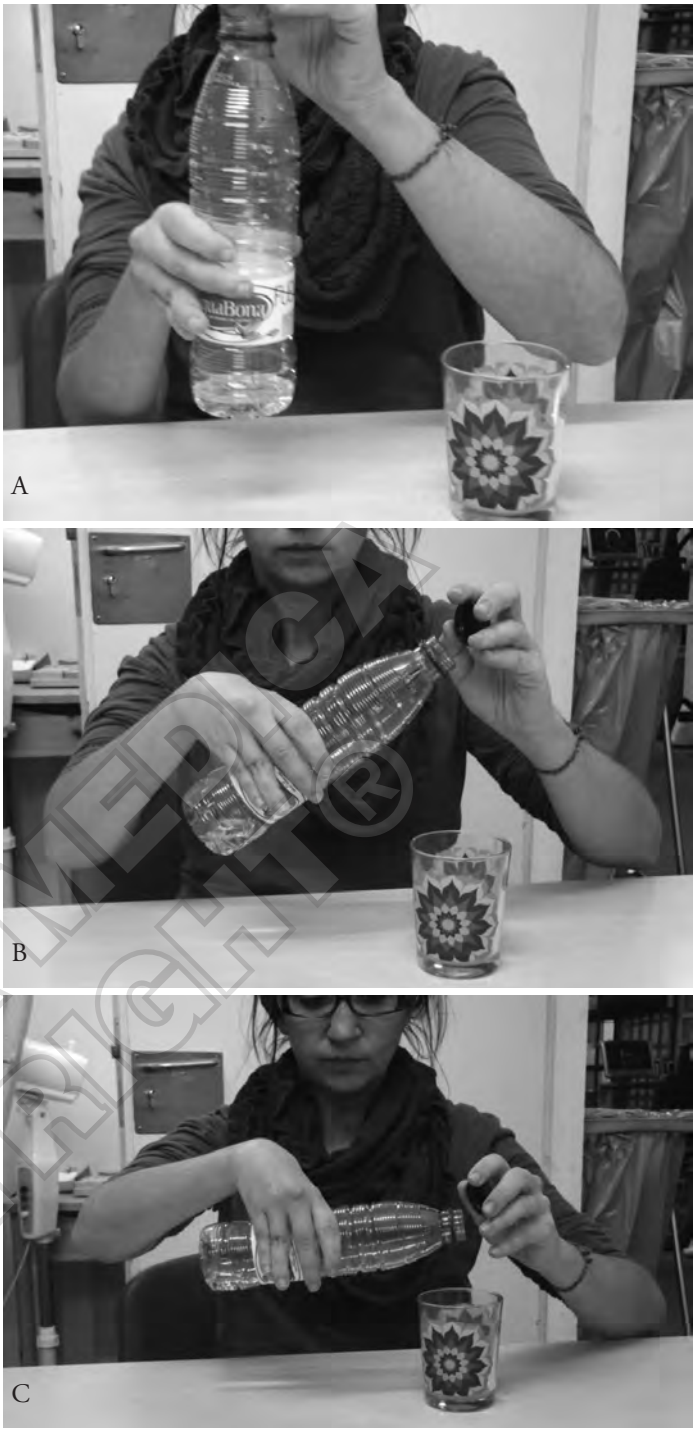

Figure 4.—A), B) e C).

which turns onto improvement in limb position, MAS (modified Ashworth Score) and gait. However, no significant improvements in function were found with BoNT- A in upper limb in stroke nor in CP [1-3].

Modified constraint-induced movement therapy (mCIMT) is a promising approach to enhance recovery after stroke, even on chronic stage [7]. This therapy was based on constraining the non-affected arm to encourage performance of therapeutic tasks with the affected arm. Sun *et al.* published in 2010, the effect of combined application of BoNT-A and mCIMT in spasticity and upper extremity motor function, comparing with BoNT-A plus conventional rehabilitation in chronic stroke patients with upper extremity spasticity [8]. The intervention group showed significantly greater improvements in elbow, wrist, and finger spasticity, affected upper extremity real-world arm function and laboratory motor activity than the control group at 6-month postinjection. Patients reported considerable satisfaction and no serious adverse events occurred. Combining BoNT-A and mCIMT is an effective and safe intervention for improving spasticity and motor function in chronic stroke patients.

Improvement in functional skills is a goal of spasticity management. For upper limb, BoNT-A doesn't seem to be enough to attain that goal. A variety of therapy modalities have been used to facilitate these improvements like neuromuscular electrical stimulation, surface electromyography training, serial casting, constraint-induced movement therapy, strengthening, and endurance training [4,9]. With this multidisciplinary approach, improvement in upper limb functionality could be reached, even in a chronic case.

CONCLUSIONS

Multidisciplinary treatments, including BoNT-A can significantly improve function in patient with untreated long term hemiparesis. Spasticity management is a multi-disciplinary approach and should be used when skilled personnel and appropriate facilities are available.

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Selective risk factors evaluation for the development of Cerebral Palsy in preterm infants in Serbia

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Prematurity is the leading cause of neonatal mortality and morbidity. Cerebral palsy (CP), of varying types and severities, remains the most prevalent major developmental disability encountered in premature infants (1). While in general population CP occurs 2 per 1000 live births, prevalence in very low birth weight (VBLW) is 6% - 10%, and approximately 40% of all children with CP were born prematurely (2). Aim of our study was to evaluate correlation of presence and frequency of selected risk factors: neonatal convulsions, asphyxio degree, degree of intracranial haemorrhagia (HIC) and presence of cystic periventricular leukomalacia (CPVL) in premature babies who were diagnosed as cerebral palsy.

MATERIAL AND METHODS

We have evaluated 18 preterm children with diagnosed CP. Regarding gestational age, patients were divided into 3 groups: group below 28th gestational week (GW), group between 28th -31st GW and group between 32nd-36th GW. We assessed separately male and female gender; as well as convulsions presence. Patients with asphyxia were divided into: group with moderate and group with severe degree. Concerning intracranial hemorrhage (HIC) we observed 4 HIC degrees: first, second, third and fourth degree. We assessed as well cystic periventricular leukomalacie (CPVL) presence. Prior inclusion in the study parents or legal guardians were informed and informed consent was obtained. The study was conducted according to the Declaration of Helsinki, approved by Institutional Review Board and followed principles of good clinical practice.

The results were presented as whole numbers and percents. The statistical interpretation was done by chi-squared test, where statistical significance was set on $p<0.05$.

RESULTS

There were 2 (11.1%) patients bellow 28 GW, 9 (50%) between 28th -31st GW and 7 (38.9%) between 32nd - 36th GW. Male gender was significantly represented with frequency of 14 (77.8%) males versus 4 females (22.2%) ($p<0.05$) (Table I). There were 10 (55.6%) patients with CP with neonatal convulsions ($p>0.05$) (Table I). Moderate degree (14 (77.8%) patients) of asphyxia was significantly frequent then severe degree (4 (22.2%) patients) ($p<0.05$) (Table I). First and second HIC degree was described in 15 (83.3%) patients while third and fourth degree in 3 (16.7%) patients ($p<0.05$) (Table I). In 13 (72.2%) patients with CP was diagnosed CPVL ($p<0.05$) (Table I).

DISCUSSION

The studies consistently report that worse neurodevelopmental outcome is more common in male children. According to some data, male gender is associated with a 30-60% increased risk for CP. From the biological point of view, the difference in neurodevelopmental outcome between the genders is difficult to understand. It is assumed that the response of immature hypoxic brain damage is modulated by gender, as well as an inflammatory response to intrauterine infection (3). Our data also indicate the higher risk of male children for the development of CP.

Given that the causes of seizures formation overlap with the causes that lead to cerebral palsy, there are no clear agreement about whether neonatal seizures, in itself, lead to neonatal brain damage (4). It is estimated that 25-35% of all children with seizures later manifest cognitive and /or motor impairment. Consequently, children who have had a neonatal seizures associated with perinatal asphyxia, severe IVH, infection, prematurity with prolonged hypoglycemia, have a worse prognosis with possible permanent neurological sequelae. In our study more than half of the patients with diagnosis of CP had seizures in the neonatal period.

Recent studies put multiple prenatal factors to the foreground as etiological factors for CP (chorioamnionitis, maternal infection, multiple pregnancy, etc.), as for term and for premature children.

Table I.—*Patients characteristics and their distribution.*

Patients characteristics		N (%)	χ^2
Gender	Male	14 (77.8)	p<0.05
	Female	4 (22.2)	
Neonatal convulsions	Present	10 (55.6)	p>0.05
	Absent	8 (44.4)	
Asphyxio degree	Moderate	14 (77.8)	p<0.05
	Severe	4 (22.2)	
HIC degree	I and II	15 (83.3)	p<0.05
	III and IV	3 (16.7)	
CPVL	Present	13 (72.2)	p<0.05
	Absent	5 (27.8)	

Asphyxia is considered as one element of multifactorial etiology of cerebral palsy, and participate 10-28% as the etiologic factor for CP in term children, and children who are born near term (1). In premature babies asphyxia is of less importance, because apgar score (AS) is not well defined as in term children. Children of less gestational age and lower birth weight are more likely to lower AS than more mature and larger children (5). Among our patients, all of them had asphyxia.

Similarly, in our study, all children with cerebral palsy have some degree of periventricular-intraventricular hemorrhage (PVH-IVH). Intracranial hemorrhage is a very important and common complication of prematurity (1). Incidence variations are closely related to gestational age, so that the PVH occurs in 60% to 28 GN premature infants, and about 40% to 34 GN (6). Studies show that the worse level of PVH-IVH correlates with poor neurodevelopmental outcome. With increasing degree of HIC there is a higher prevalence of CP, the problems of the motoring organization, major damage and worse cognitive functioning.

Periventricular leukomalacia (PVL) is a major ischemic lesion of immature child. The incidence of PVL is estimated at 15-20% in extremely immature children (3-4% CPVL in VLBW children, 10-15% associated with IVH PVL - PVH in children under TM 1000g) (7). Cyst formation correlates with the development of CP.

Of all the clinical forms of cerebral palsy in premature infants spastic diplegia is the most common form of CP. At least two-thirds of all children with this disorder are born before 37 week of gestation.

On the basis of the clinical picture is white matter lesion of the motoric path for the lower extremities. If the cystic lesions are more extensive, spastic quadriplegia can be developed. In our study 72.2% of children with CP had CPVL.

CONCLUSION

In our study we found that majority of patients with CP belong to group between 28th -31st GW. Given that these are children born prematurely, the presence of some degree of asphyxia and intracranial hemorrhage in the group was expected. Neonatal seizures were present in more than half of the children but there was no statistically significant correlation with the presence of CP. We found that male gender and CPVL are significant risk factors for the development of CP in preterm infants.

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Neuropsychological treatment in severe case of cognitive impairment in cerebral hemorrhage

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This work was prompted by the need to evaluate the possibility that a severe case of cognitive impairment, caused by a cerebral hemorrhage and characterized by an overall loss of intellectual capacity and a marked reduction of reasoning and mental processes, as revealed by speech assessment and neuropsychological examinations, could be improved using an early, intensive, multispecialty and cross-functional rehabilitative approach.

MATERIALS AND METHODS

The patient was a 63 year old male admitted to our hospital for a mild-to-medium facio-brachiocrural hemiparesis of the right side and mixed dysphasia, following a intraparenchymal hemorrhage in the left deep fronto-temporo-parietal region of the basal ganglia. Since the first evaluation, the most dominant symptom of the disorder appeared to be cognitive impairment rather than the mild motor deficit. For this reason the patient was initially subjected to speech assessment and neuropsychological examination (1) and after an evaluation by a multi-specialist team (medical doctor, specialist in physical medicine and rehabilitation, neuropsycologist, physiotherapist, speech therapist, occupational therapist, and a nurse), was started on an intensive, cross-functional rehabilitative approach. After 8 weeks, the patient was again subjected to the same initial battery of tests. After release from the hospital, the patient was followed for a year at an outpatient facility, with progressively less frequent visits. After the year, the patient was again seen for a final evaluation.

RESULTS AND DISCUSSION

At the end of the intensive multi-professional approach, the speech therapy re-assessment showed marked improvement in the repetitions and numbers items, and in the writing from dictation, the areas initially most deficient. This may be related to an improvement of the M.B.T.

Comprehension of both written and oral sentences was good. Reading, comprehension, word generation and naming were very good. The neuropsychological evaluation after one year revealed 1) an improvement in daily function (ADL and IADL) even in the absence of a caregiver (the patient did not have one) that could attest to it; the patient's own assessment of improved ability to handle day-to-day living seemed trustworthy. 2) the persistence of some deficits in higher cortical functions in a relatively stable framework in which there are only slight improvements - deficit in verbal understanding, access to the internal lexicon, logical reasoning and ante-retrograde verbal memory.

CONCLUSIONS

Although there is always the possibility of spontaneous recovery from the initial symptoms, it is clear that, among the various tests, the best recovery performance was obtained after the intensive regimen in the hospital. This clearly suggests that early intervention, within a time period deemed appropriate by the rehabilitation team, and an intense, multi-specialist and combined effort of several team members allows for a better and faster recovery of cognitive functions.

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Le vibrazioni muscolari selettive nel trattamento delle patologie neuromuscolari

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Le vibrazioni meccano sonore vengono utilizzate in ambito riabilitativo per il trattamento non invasivo di patologie ortopediche e neurologiche, dove è necessario un trattamento di recupero muscolare e controllo motorio, per la loro azione sul sistema neuromuscoloscheletrico.

I trasduttori applicati lungo le catene cinetiche producono delle vibrazioni meccaniche che interagiscono attraverso diverse frequenze con i meccanorecettori, gli organi tendinei del Golgi e i fusi neuromuscolari; gli stimoli prodotti dalle vibrazioni trasmettono l'informazione al sistema nervoso centrale: i centri motori superiori vengono stimolati dalle vibrazioni, in modo da ottenere un migliore rendimento dei comandi nervosi preposti al reclutamento muscolare.

Le vibrazioni selettive portano un effetto benefico sul metabolismo muscolare, hanno un effetto analgesico sui tessuti e sul muscolo, aumentano la circolazione sanguigna locale, stimolano la formazione di tessuto osseo e attivano la secrezione di ormoni specifici (aumento del testosterone e ormone somatotropo e diminuzione di cortisolo).

SCOPO DEL LAVORO

Valutare le vibrazioni nel miglioramento funzionale della coordinazione, resistenza e nella prevenzione del rischio di caduta in pazienti affetti da Sclerosi Multipla.

MATERIALI E METODI

Sono stati trattati 5 pazienti con Sclerosi Multipla con paresi agli arti inferiori in grado di deambulare autonomamente.

I soggetti sono stati sottoposti a:

— Valutazione della coordinazione e dell'equilibrio attraverso una prova su pedana propriocettiva "Biodex Balance". Attraverso questo macchinario viene analizzato l'indice di oscillazione, con gli occhi aperti e con gli occhi chiusi su una superficie stabile e su una superficie di schiuma. Effettuata una prova di 30 secondi per ogni tipo di condizione.

— Valutazione della fatica, del lavoro, della resistenza e della forza attraverso un test isocinetico con "SP4 Biodex". Completamento di tre prove da cinque serie ciascuno, ad una velocità di 210 ° / s, 180 ° / s e 150 ° se / s esclusi due pazienti sottoposti a test diversi a causa di problemi dovuti alla loro disabilità. Le prove sono state effettuate sulle tibiotarsiche.

— Valutazione del passo, dopo aver camminato su un tapis roulant "GT2 Biodex". Effettuato il test del cammino di 6 minuti e la valutazione degli indicatori di varianza del passo, velocità, tempo su ogni piede e la distanza percorsa.

Le valutazioni vengono effettuate a inizio ciclo, a fine ciclo e a distanza di 1 mese.

Ad ogni paziente sono state praticate 10 sedute giornaliere di durata di 30' 100 Hz con placche posizionate sui fusi nm delle catene cinetiche anteriore e posteriore a sedute alterne ad entrambi gli AAII.

Tabella I

		Media pazienti prima		Media pazienti dopo	
		Fless. dorsale dx sx	Fless. plantare dx sx	Fless. dorsale dx sx	Fless. plantare dx sx
Picco torque 210°/s	N/m	7,3 8	7,9 6,6	14 11	10,5 10,1
Picco torque 150°/s	N/m	4,3 9,3	12,8 9,9	17 12,5	15,4 13,9
Picco torque 180°/s	N/m	13,2 13,4	18,3 13,7	21,5 16,9	23 20
Lavoro totale 210°/s	Joule	14,7 15,3	10,6 9,8	34,4 20,5	13,9 15,2
Lavoro totale 150°/s	Joule	22,2 19,7	22,3 17,5	39,5 25,2	25,6 26,2
Lavoro totale 180°/s	Joule	99 98	138,3 95,6	162 98	178,8 151,6
Numero passi		484		531	
Velocità media	Km/h	1,45		2,4	
Distanza	m	146		230,5	
		Sinistro	Destro	Sinistro	Destro
Coefficiente di varianza	%	36,7	21	10,25	10
Tempo su ogni piede	%	52,5	50	50,5	49,5
Lunghezza media passo	cm	31,5	30	46,5	45,3
		Sup. stabile	Foam Surface	Sup. stabile	Foam Surface
Indice di oscillazione occhi aperti		1,1	2,4	1,1	1,7
Indice di oscillazione occhi chiusi		2,3	3,1	2,5	3,9

RISULTATI

Oggettivi: dai dati emersi si è preso in considerazione il picco torque per la forza, il lavoro totale svolto e la velocità media, la distanza percorsa, il numero di passi, il coefficiente di varianza, il tempo trascorso su ogni piede per la deambulazione e in tutti i pazienti si è verificato un miglioramento significativo di tutti i parametri esaminati (vedi tabella I)

Soggettivi: i pz trattati riferiscono maggior benessere dovuto a riduzione dell'ipertono muscolare. Questo porta ad avere gambe più leggere e maggior fluidità motoria.

CONCLUSIONI

Lo studio ha dimostrato efficacia delle vibrazioni meccano sonore nel migliorare forza, resistenza, coordinazione, fatica e riduzione rischio di caduta in pazienti con patologia neuromuscolare cronica degenerativa.

Opioids in the functional rehabilitation after knee replacement: our experience with prolonged-release oxycodone/naloxone

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International Guidelines recommend oral opioids as first-line drugs for the treatment of pain of moderate-severe intensity and/or uncontrolled by non-opioid analgesic therapy (1-3).

The management of adverse events associated with analgesic treatments – and in particular with opioids – represents a major clinical issue which requires targeted and effective therapeutic strategies. The most common side effects associated with opioids are constipation, nausea and vomiting (4).

The prolonged-release (PR) association of oxycodone and naloxone, currently indicated for the treatment of severe pain, can prevent or reduce gastrointestinal dysfunction (5). When administered orally, naloxone exerts its pharmacodynamic action only on the bowel receptors: in fact, naloxone undergoes an extensive first-pass metabolism by the liver which makes the systemic action of the drug not clinically-relevant (bioavailability <3). Thanks to its high affinity for the intestinal opioid receptor, naloxone competitively inhibits the action of oxycodone in the gut, thus reducing the severity of bowel dysfunction without diminishing the analgesic efficacy of the opioid (6).

This association also reduces the need for other therapeutic measures (anti-emetic drugs, oral and rectal laxatives, enemas); notably, these measures are uncomfortable for patients, present a limited efficacy (since they act only on the symptoms of opioid-induced bowel dysfunction, and not on the underlying mechanisms), and are associated with high costs.

The primary aim of this study is to evaluate the analgesic efficacy of oxycodone/naloxone PR in the functional rehabilitation of patients with moderate-severe pain after total knee replacement. The study also assesses bowel function, tolerability, and quality of life (QoL).

PATIENTS AND METHODS

In total, 25 patients (72% females; mean age 70.3±7.8 years) with a recent total knee replacement were followed at our Center for functional rehabilitation. All patients presented moderate-severe pain at baseline, uncontrolled with non-opiod analgesics (mean score on a Numerical Rating Scale [NRS]: 5.6±3.0). No other inclusion/exclusion criteria were applied. Therapy with oxycodone/naloxone PR was initiated in all patients (mean oxycodone dose: 10.9±3.0 mg/day). Enrolled patients were followed for 14 days, and the following variables were assessed: pain intensity on a NRS; bowel function, on the Bowel Function Index (BFI) scale; incidence of adverse events; QoL. Functional recovery was evaluated by measuring walking speed and knee flexion angle.

RESULTS

With the administration of oxycodone/naloxone PR at a fixed dose, pain intensity was reduced from 5.6±3.0 at baseline to 1.2±1.4 at day 14 (Figure 1).

The effective control of pain allowed the a good functional recovery: walking speed increased from 0.56±2.22 m/s (baseline) to

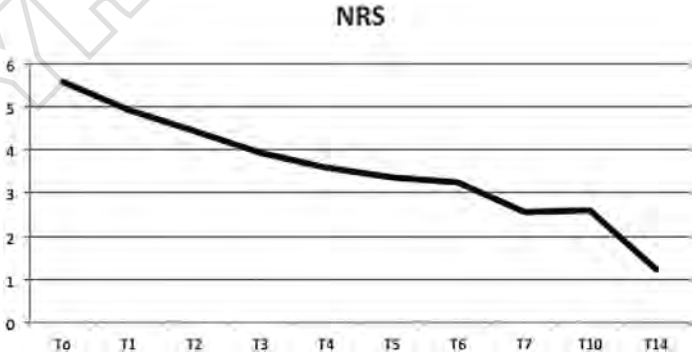

Figure 1.—Pain intensity during the follow-up period, as assessed by NRS.

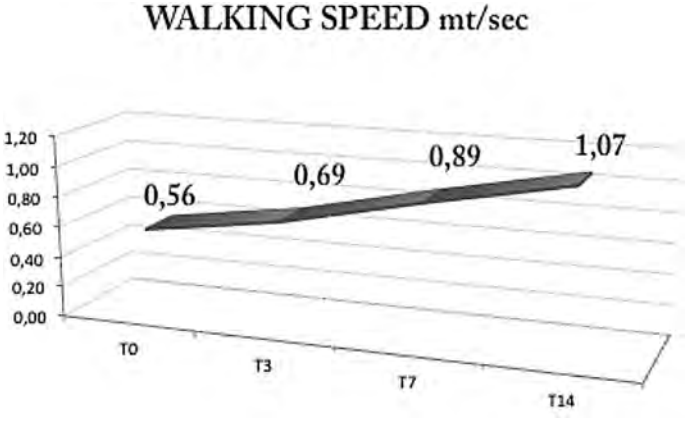

Figure 2.—Walking speed during the follow-up period.

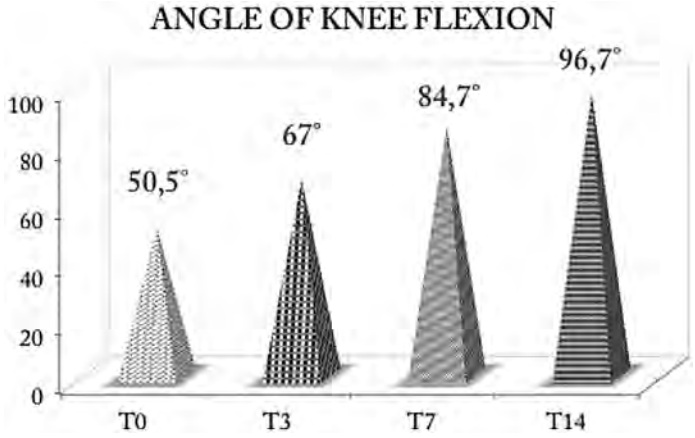

Figure 3.—Knee flexion angle during the follow-up period.

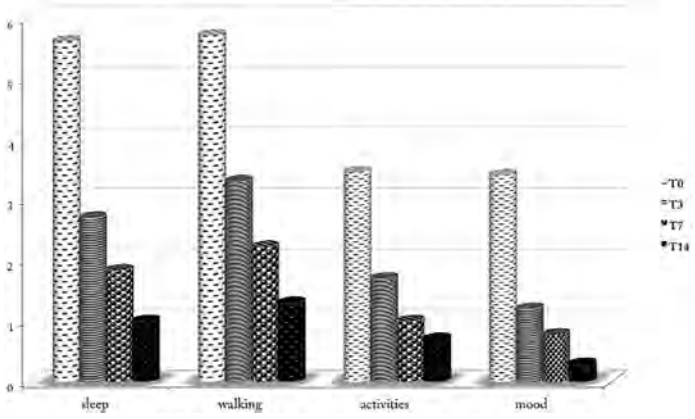

Figure 4.—Impact of pain on QoL during the follow-up period.

0.89±0.44 m/s (day 7) and 1.07±0.49 (day 14) (Figure 2). Similarly, knee flexion angle increased from 50.5±19.4° (baseline) to 84.7±17.2° (day 7) and 96.7±15.8° (day 14) (Figure 3).

The administration of oxycodone did not result in a worsening of bowel function: six patients with a moderate/severe impairment of bowel function at baseline showed a slight improvement of this parameter over the follow-up period.

Two patients showed mild dizziness and somnolence; in one patient, dizziness episodes had already been reported before the initiation of oxycodone/naloxone PR therapy. Nausea and vomiting were observed in 5 patients, but did not require treatment withdrawal. No patient reported itching, dry mouth or increased wetting. Only one patient interrupted the therapy (day 5), due to poor compliance.

The evaluation of the impact of pain on QoL – in particular on walking ability – was of particular relevance. Data show a marked improvement in QoL (mean increase: 70.2%), especially in quality of sleep and walking ability (Figure 4).

DISCUSSION

Effective control of pain in the post-surgical period has a major importance in functional rehabilitation. Several recently-published studies have investigated low-dose strong opioids in this setting. However, a wider use of these drugs is limited by their potential association with adverse events, such as constipation and nausea/vomiting.

Our experience, collected in a sample of patients who underwent total knee replacement, confirmed the efficacy of this therapeutic approach. The administration of a fixed dose or oxycodone/naloxone PR allowed a rapid and effective pain control together with a favourable tolerability profile. This therapeutic approach allowed an excellent functional rehabilitation over a pre-planned period of 14 days.

CONCLUSIONS

PR oxycodone/naloxone was associated with an effective control of pain – with a favourable tolerability profile – in patients who underwent a total knee replacement. The effective control of pain allowed a prompt functional rehabilitation.

We believe that further studies on PR oxycodone/naloxone may be advocated in order to evaluate the potential reduction in the duration of in-patient staying for patients with total knee replacement.

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Observational study on the therapy with intra-articular hyaluronic acid and rheabilitation treatment of coxarthrosis

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Osteoarthritis of the hip, at an advanced stage, brings to functional limitations which are responsible for the deterioration of the quality of life of those who are affected. In many cases, the use of surgery therapy (prothesis) is the gold standard approach for these patients. However, there are cases in which for comorbid conditions or limited availability of patient this is not possible, so the use of viscosupplementation may be a viable alternative. This study aims to evaluate the effectiveness of the combination of viscosupplementation with hyaluronic acid of high molecular weight injected under ultrasound guidance in hip joint and rehabilitation protocol programmed in patients with osteoarthritis.

MATERIALS AND METHODS

We enrolled 12 patients with symptomatic mono or bilateral osteoarthritis of the hip, radiological grade II or III according to Kellgren-Lawrence which were not candidates for elective surgery. Were subjected to intra-articular injection with ac. Hyaluronic acid high molecular weight (> 1500KDa) (Hyalubrix 60mg/4 mL, Fidia Farmaceutici spa), under ultrasound guidance and, after 6 days of relative rest, rehabilitative treatment approach targeting the antalgic attitude of the patient with coxarthrosis and then combating hip's pain, recovery of myo-tendinous retraction of the muscle groups involved to maintain the antalgic posture of the hip joint maneuvers poumpage to enhance the effects of hyaluronic acid and to release muscle groups contract, recovery of muscle weakness of the stabilizing muscles of the pelvic girdle, and finally the load monopodic proprioceptive rehabilitation. The effectiveness of the combination therapy was assessed by the change in the functional index of WOMAC, VAS pain scale, NSAID consumption; VAS global assessment of the patient and the physician recorded at baseline and after 3-6-9 months of therapy and any adverse events.

RESULTS

In assessments at 3, 6 and 9 months were detected a reduction >60% of pain (VAS scale) and WOMAC in 40% of patients after the first intra-articular injection, > 30% <60% in 50%, <30% in 10%. There were no significant side effects during procedures infiltrative or during the observational period.

CONCLUSIONS

Preliminary data confirm the effectiveness of the combination therapy intraarticular-specific rehabilitation program in patients with coxarthrosis, testifying the tolerability, safety of the injective procedure and their synergism in reduction of painful symptoms and recovery of the functional capacity.

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Tecniche manipolative originali

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La manipolazione vertebrale (MV) in Medicina Manuale è il gesto terapeutico più noto, non unico, ma certamente il più rapido ed efficace. Se indubbia è ormai la sua utilità quando affidata a mani qualificate, ancora discusso è il suo meccanismo d'azione, verosimilmente neurologico nella maggior parte dei casi, tuttora oggetto di studio. La MV è un atto medico, che può essere responsabile d'incidenti ed eventi avversi (1). È necessario perciò perseguire la *medicalizzazione* della MV, alla quale si può giungere solo attraverso un'adeguata preparazione dei Medici operatori, sia per quanto riguarda la conoscenza dei principi della disciplina, sia sotto l'aspetto pratico dell'acquisizione delle capacità tecniche. Tutto ciò affinché, di fronte a un caso clinico, il medico che pone la diagnosi eziologica di disturbo doloroso intervertebrale minore possa lui stesso, con competenza e senza rischi, compiere l'atto manipolativo (2). Riteniamo pertanto di dover insistere sull'insegnamento, rivolto ai medici, delle tecniche, sulla loro revisione, sulla proposta di varianti o di tecniche originali. Un ampio patrimonio di tecniche è stato messo a nostra disposizione da R. Maigne e collaboratori. A queste noi attingiamo nella nostra pratica quotidiana, scegliendo fra queste in modo da adattare il trattamento allo scopo funzionale da raggiungere.

MATERIALI E METODI

Negli anni 2010 – 2011 due nuove tecniche manipolative sono state fatte oggetto di studio clinico prospettico, randomizzato, con osservatore esterno: 1) La manipolazione lombare bassa (lombosacrale) L5-S1 *"seduto a cavallo, in estensione e bacino bloccato*" 2) La manipolazione dorsale o dorso-lombare a paziente supino, con tecnica *"mano-torace, in decubito dorsale, in estensione e lieve rotazione"*.

Prima tecnica. Negli anni 2010 – 2011, 37 pazienti sono stati trattati con la tecnica manipolativa oggetto di studio L5-S1 "seduto a cavallo, in estensione e bacino bloccato", a confronto con un campione di 32 pazienti trattati con manipolazione lombare bassa L5-S1 "in decubito laterale", in lordosi o in cifosi secondo le indicazioni date dall'esame premanipolativo.

— **Messa in posizione.** Paziente seduto a cavallo dell'estremità del lettino. L'operatore è in piedi dietro di lui. Il paziente incrocia le braccia sul petto e con ciascuna mano impugna il braccio opposto.

— **Messa in tensione.** Il medico, passando il suo braccio sinistro davanti al torace del soggetto, ne afferra il braccio destro e trascina il tronco in lateroflessione destra, in estensione e in rotazione sinistra. Contemporaneamente pone e mantiene con fermezza la sua mano destra sulla cresta iliaca del paziente, bloccando completamente il bacino durante tutta la manovra.

— **Impulso manipolativo.** L'impulso manipolativo è assicurato da un'azione combinata dell'operatore, che richiede un buon sincronismo: brusco trasferimento del peso del corpo dal piede sinistro al destro, azione breve e simultanea delle sue mani: la sinistra imprime la rotazione del busto mentre la destra mantiene bloccato il bacino al lettino (Figura 1).

— **N.B.** L'operatore deve essere quasi a contatto del paziente e apprezzare, durante la manovra, che il movimento passivo avvenga tra la colonna vertebrale bloccata in estensione e il bacino mantenuto bloccato contro il lettino.

— **Indicazioni**. Lombalgie d'origine L5-S1, lombo sciatalgie. Alcuni sostengono questa tecnica una manipolazione sacro-iliaca; essendo bloccato il movimento delle articolazioni vertebrali, suppongono che la manovra agisca elettivamente sull'articolazione sacro-iliaca dello stesso lato.

Seconda tecnica. Negli stessi anni, 34 pazienti sono stati trattati con tecnica "mano-torace" in decubito dorsale con mano contrappoggio su spalla, in estensione e lieve rotazione. Il gruppo di controllo era costituito da 31 pazienti trattati con tecnica detta in "enroulé dorsal", in cifosi.

— **Messa in posizione.** Paziente in posizione supina con le braccia incrociate sul petto e le mani che abbracciano le spalle. I

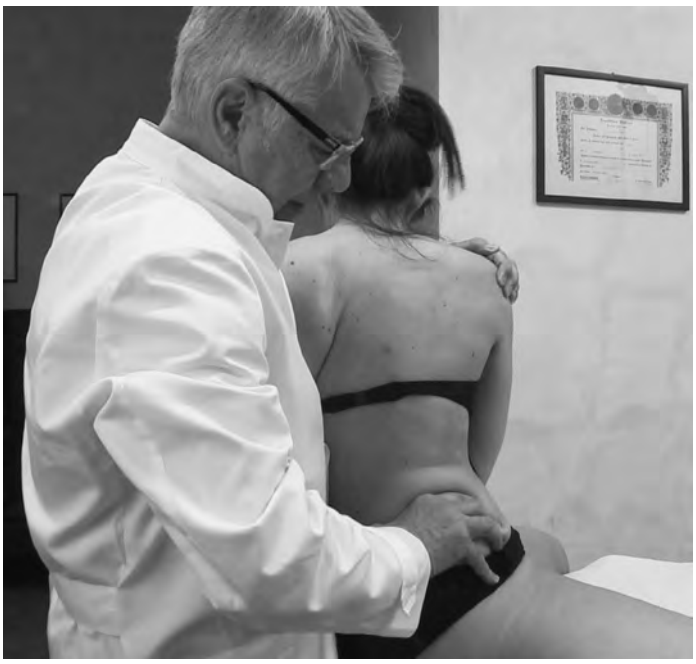

Figura 1. — Manipolazione L5-S1.

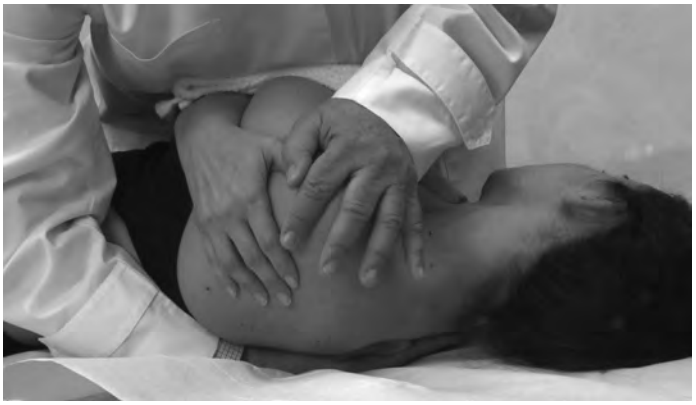

Figura 2. — Manipolazione dorsale.

Tabella I.—*Manipolazione L5-S1, paziente seduto a cavallo, in estensione e bacino bloccato.*

N° pazienti	Risultati positivi (a 1 mese)	Risultati negativi (a 1 mese)
Gruppo in studio: 37	32 (86,48%)	5 (13,51%)
Gruppo di controllo: 32	25 (78,12%)	7 (21,87%)

Tabella II.—*Manipolazione dorsale "mano-contrappoggio, in decubito dorsale, in estensione e lieve rotazione".*

N° pazienti	Risultati positivi (a 1 mese)	Risultati negativi (a 1 mese
Gruppo in studio: 34	29 (85,29%)	5 (14,70%)
Gruppo di controllo: 31	24 (77,41%)	7 (22,58%)

gomiti si devono trovare uniti e affiancati sulla stessa linea verticale. L'operatore in piedi a destra del lettino pone un asciugamano di spugna ripiegato sui gomiti del paziente, per rendere meno sgradevole il contatto reciproco. Con la mano sinistra afferra la spalla sinistra del paziente e, facendo leva con il proprio addome sui gomiti uniti del paziente, lo fa ruotare verso di sé. A questo punto colloca l'eminenza tenar della propria mano destra a livello del segmento da manipolare, con l'apofisi spinosa contenuta nel cavo della mano. Riconduce poi il paziente in posizione supina. Pone la mano sinistra sulla spalla sinistra del paziente.

— **Messa in tensione.** L'operatore, con il torace e con la mano sinistra posta sulla spalla del paziente, esercita una pressione dall'alto verso il basso e a sinistra.

— **Impulso manipolativo.** La manipolazione è effettuata alla fine dell'espirazione congiunta del paziente e dell'operatore. Quest'ultimo imprime un breve e brusco impulso con il torace in direzione della propria eminenza tenar destra (Figura 2).

— **N.B.** In ragione della maggior potenza che si può esercitare sulla vertebra dolorosa, rispetto alla manovra classica con l'operatore che mantiene la testa e il rachide dorsale in flessione, la manovra qui descritta dovrà essere sempre fatta con molta dolcezza e con il completo rilassamento del paziente. Si tratta di una manipolazione con una componente di estensione del rachide sovrastante il segmento da manipolare. Ha il vantaggio di essere più agevole per il paziente, che si trova meno compresso e in situazione di minor costrizione delle vie respiratorie.

— **Indicazioni.** Dorsalgie comuni a livello dorsale medio/alto, frequenti negli sportivi (tennisti, golfisti ecc.) e nelle attività lavorative che inducono posture prolungate in cifosi dorsale.

RISULTATI

Come evidenziato dai dati riportati in tabella I e II, entrambe le nuove tecniche hanno mostrato risultati migliori rispetto ai gruppi di controllo. La prima si è rivelata più efficace in particolare in pazienti con lombosciatalgia e donne gravide con algie lombo-sacrali pelviche.

CONCLUSIONI

I migliori risultati ottenuti con le nuove manovre manipolative inducono a riflettere sulla stretta correlazione tra studi anatomo-neurofisiologici e tecniche terapeutiche. Se da un lato sono i primi a indicare la logica via per l'atto terapeutico, spesso è anche la tecnica, frutto dell'ingegnosità umana, a gettare luce, attraverso il suo meccanismo d'azione terapeutica, su certe patologie e sulla loro genesi.

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La pratica di amministratore di sostegno: esperienza del centro di riabilitazione Terranuova

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SUMMARY

Nelle unità di riabilitazione, tra i vari problemi che si presentano quotidianamente, vi è quello di dover praticare una serie di trattamenti medici, invasivi e non, a pazienti non competenti, ovvero soggetti che non sono ancora stati dichiarati giuridicamente incapaci, ma che clinicamente lo sono, come ad esempio pazienti in stato vegetativo o più in generale gravi cerebrolesi.

Molti trattamenti non possono essere ascritti alla categoria degli atti salva vita o meglio detti atti di urgenza, condizione in cui il medico ha l'obbligo giuridico di intervenire a prescindere dell'esistenza di un consenso informato.

Gli interventi medici non riconducibili ad interventi salva vita, che abbisognano di un consenso che il paziente chiaramente non può dare e che, se non è un rappresentante legale o un amministratore di sostegno, neanche il familiare può dare, impongono al sanitario il potere/dovere di presentare ricorso al Giudice Tutelare per la nomina di un amministratore di sostegno.

I pazienti con grave cerebro lesione acquisita GCLA presentano i postumi di un danno cerebrale, di origine traumatica o di altra natura, tale da determinare una condizione di coma, più o meno protratto, e menomazioni sensitivo-motorie, cognitive e comportamentali, che comportano disabilità grave.

Si tratta di persone che dopo un ricovero ospedaliero per trattamenti rianimatori o neurochirurgici di durata variabile da alcuni giorni ad alcune settimane, sono sottoposti a trattamenti medico- riabilitativi di tipo intensivo in regime di ricovero ospedaliero. Spesso permangono sequele che rendono necessari interventi di carattere sanitario e sociale a lungo termine.

La persona con grave cerebro lesione acquisita di frequente non è in grado di provvedere autonomamente ai bisogni primari della vita e necessita di essere sostenuta e accudita nell'espletamento delle sue funzioni, spesso anche le più elementari.

È evidente che il soggetto con GCLA in fase di postacuzie non può dare il proprio consenso al trattamento dei dati personali sensibili, né tantomeno al percorso riabilitativo progettato per lui.

Tutti i cittadini hanno il diritto di essere informati sul loro stato di salute e/o di malattia e devono prestare il loro consenso agli atti diagnostici e terapeutici cui vengono sottoposti. Con la legge n 6 del 9 gennaio 2004 si provvede ad identificare, accanto alle misure tradizionali dell'interdizione dell'inabilitazione, un nuovo istituto di protezione civilistica per tutti coloro che non sono in grado di prestare il proprio consenso: l' "Amministratore di Sostegno".

Il legislatore ci ha concesso uno strumento da utilizzare a tutela anche dei pazienti con postumi di GCLA.

Nel nostro Centro Riabilitazione Terranuova, dove vengono accolti soggetti con grave cerebro lesione acquisita, stiamo lavorando per incrementare le misure a tutela dei Nostri pazienti, ed è in questa logica, che utilizziamo un protocollo condiviso con l'azienda ASL 8, che ci consente, già dall'ingresso in reparto dei soggetti con gravi GCLA, di iniziare subito la pratica per la nomina dell'amministratore di sostegno. Dall'agosto 2010 abbiamo ricoverato in reparto Gravi cerebro lesioni acquisite 160 pazienti.

Abbiamo inoltrato richiesta di parere nomina di amministratore di sostegno alla UO di Medicina Legale per 99 pazienti. Di questi abbiamo ottenuto 72 nomine.

I tempi di attesa per la disposizione della nomina sono andati da un minimo di 1 giorno ad un massimo di 72 giorni.

I differenti orientamenti emersi in giurisprudenza sull'applicabilità della legge n 6/2004, testimoniano l'attenzione degli operatori intorno ad un provvedimento che investe la sfera del diritto e della medicina e che, nella sua applicabilità, ha sicuramente toccato alcune questioni di fondo: il rapporto tra cittadino e il potere pubblico, i limiti di ingerenza nella sfera dei diritti della persona umana. Emerge la responsabilità dei servizi sociali e sanitari nei confronti del cittadino che ha diritto ad assistenza e protezione; la responsabilità del medico nella scelta delle cure e terapie, in caso di urgenza, verso la persona incapace che non può esprimere il consenso, e la legittimità del potere conferito all'amministratore di sostegno di assumere tali decisioni. In questo modo l'ads assume su di sé, dopo aver espresso il consenso informato, quella responsabilità che prima incombeva sul medico.

INTRODUCTION

La legge 9 gennaio 2004 n 6 ha introdotto nel nostro ordinamento l'istituto dell'amministratore di sostegno, con una conseguente riforma del sistema di protezione delle persone prive in tutto o in parte di autonomia. La legge consente la partecipazione attiva del beneficiario nell'espletamento delle funzioni della vita quotidiana, mediante interventi di sostegno temporanei o permanenti.. Il nuovo articolo 404 prevede infatti la possibilità di nomina di un amministratore di sostegno alla persona che, per effetto di una infermità, ovvero di una menomazione fisica o psichica, si trova nella impossibilità, anche parziale o temporanea di provvedere ai propri interessi. La possibilità di intervenire a protezione della persona affetta da infermità psichica sembra coincidere con i presupposti che sono previsti anche in materia di interdizione. La legislatura ha, infatti, mantenuto in vigore sia l'istituto dell'interdizione che quel-

lo della inabilitazione ed ha rimesso alla *valutazione* discrezionale del giudice di individuare la norma applicabile allo specifico caso.

Spetta al giudice determinare la non chiara linea di confine tra i tre istituti ovvero capire sino a che punto è consentito estendere l'ambito di intervento dell'amministratore di sostegno, quando, invece, divenga necessario rimettere integralmente a un tutore la cura della persona e del suo patrimonio.

Il più recente e maggioritario orientamento sostiene che l'amministratore di sostegno sia lo strumento di protezione da privilegiarsi rispetto all'interdizione e all'inabilitazione, in quanto l'intervento dell'ordinamento sulla persona inabile si è concentrato sul concetto di "protezione", e quindi non va più attribuito un rilievo discriminante al grado dell'incapacità del soggetto. Ne consegue che il giudice tutelare nell'assumere provvedimenti a sostegno di una persona priva in tutto o in parte di autonomia, non deve solo far riferimento al suo grado di capacità, bensì valutare solo la sua esigenza di minore o maggiore protezione.

La legge n 6/2004 prevede la possibilità di passaggio dall'applicazione dell'istituto di amministratore di sostegno all'interdizione e viceversa, ma lascia tale valutazione alla discrezionalità del singolo giudice, e non indica con precisione con quali formalità avvenga il passaggio da un procedimento all'altro.

Tra i compiti dell'amministratore di sostegno è compresa anche la cura della persona e le problematiche connesse alle scelte abitative, assistenziali e sanitarie. Sono frequenti i ricorsi su richiesta di medici curanti o strutture sanitarie e assistenziali per la nomina di un amministratore di sostegno al fine di prestar il consenso informato a interventi terapeutici o chirurgici, o di fare ricoverare la persona.

Il Giudice Tutelare nominando l'amministratore di sostegno nell'esclusivo interesse della persona in difficoltà sceglie solitamente un membro della famiglia. Ma se il Giudice ne ravvisa l'opportunità può chiamare all'incarico anche un'altra persona idonea, di solito un avvocato o un commercialista.

L'Amministratore di sostegno (ads) è tenuto periodicamente a presentare un rendiconto relativo all'attività svolta nell'interesse del beneficiario della nomina e delle sue condizioni di vita.

MATERIALS AND METHODS

Pratica per la nomina dell'amministratore di sostegno

Molti sono i soggetti legittimati a proporre azioni formali per promuovere la nomina dell'amministratore di sostegno. Due sono obbligati: il pubblico ministero e i responsabili dei servizi sanitari e sociali; tre altri soggetti ne hanno facoltà: i parenti, i conviventi stabili e l'interessato. La legittimazione ad attivare l'amministratore di sostegno da parte dei responsabili dei servizi sanitari e sociali direttamente impegnati nella cura e assistenza della persona costituisce una novità in senso assoluto. Di norma i servizi sociali e sanitari hanno solo facoltà o dovere di segnalazione, di denuncia o di referto all'autorità giudiziaria. In questo caso, invece, i responsabili dei servizi sanitari e sociali, ove a conoscenza di fatti tali da rendere opportuna l'apertura del procedimento, sono tenuti a presentare ricorso direttamente al giudice tutelare. I servizi, invece, non possono ricorrere per promuovere l'interdizione o l'inabilitazione.

Gli altri soggetti che possono presentare ricorso per l'amministratore di sostegno sono i parenti entro il quarto grado, i coniugi, gli affini entro il secondo grado. Ad essi sono aggiunti i conviventi stabili del beneficiario.

Poiché la procedura ha natura di volontaria giurisdizione, le parti private possono presentare ricorso personalmente; in alternativa, esse possono farsi rappresentare da un avvocato. Anche i servizi possono depositare al giudice tutelare ricorso per l'amministratore di sostegno in proprio, senza dover essere assistiti da un difensore tecnico.

Il ricorso deve contenere, oltre i dati del ricorrente, le generalità del beneficiario, la sua dimora, le ragioni per cui si richiede la nomina, il nominativo e il domicilio del coniuge, dei discendenti, degli ascendenti, dei fratelli e dei conviventi del beneficiario. È essenziale che sia allegata alla richiesta una esaustiva elencazione delle ragioni per cui si richiede l'amministratore di sostegno al fine di individuare i bisogni della persona beneficiaria e i compiti di sostituzione di assistenza che dovrebbero essere attribuiti all'amministratore.

Il ricorso presentato dai servizi sanitari e sociali dovrebbe essere corredato da una relazione che racconti vicende personali e familiari e condizioni di salute della persona interessata e deve essere depositato in cancelleria del giudice tutelare del luogo dove la persona interessata ha residenza o domicilio.

Il procedimento per l'istituzione dell'amministratore di sostegno si svolge secondo quanto disposto dall'articolo 407. Nel corso del procedimento il Giudice Tutelare deve accertare quale sia la menomazione o l'infermità che pregiudica il soggetto interessato, quali effetti abbia sulla capacità di agire, quali siano le sue residue capacità attuali di agire e come limitarle nel minor modo possibile,. Deve stabilire quale forma di sostegno gli potrebbe essere utile. Al termine degli accertamenti il giudice tutelare, con decreto emanato entro sessanta giorni dal deposito del ricorso, provvede alla nomina dell'amministratore di sostegno.

RESULTS

L'esperienza nel centro di riabilitazione Terranuova BNI SPA

Il Centro di Riabilitazione Terranuova Spa (CRT Spa) ha in carico 23 posti letto per Gravi Cerebrolesioni Acquisite è centro di riferimento per l'Area Vasta Sud-Est in Toscana e ricovera pazienti provenienti da altre regioni italiane.

È stato necessario porre in nostri pazienti nella condizione di essere tutelati. E per questo è stata attivata una procedura per la nomina di "Amministratore di sostegno".

È stata, allora, adottata la pratica aziendale della USL 8 Arezzo, approvata dalla Direzione Sanitaria il 10 agosto 2010 – Codice Documento AADS042- che indica le modalità di attivazione dell'Amministratore.

Per selezionare i pazienti non in condizione di autodeterminarsi viene effettuata una valutazione clinica condivisa con i professionisti dell'equipe.

— All'ingresso in reparto: è raccolta una accurata anamnesi fisiologica e patologica, eseguito un preciso esame obiettivo generale e neurologico, acquisite immagini relative alla lesione cerebrale, eseguite indagini neurofisiologiche SEP ed EEG, esami clinici e strumentali

— Misurazione del carico assistenziale utilizzando anche scale di valutazione, la FIM (Functional Indipendence Measure) che valuta l'autonomia nelle varie aree motorio-sfinteriche e cognitive con un punteggio crescente dalla completa dipendenza alla totale indipendenza e la DRS (Disability Rating Scale) che esprime l'aspetto relazionale di vigilanza e consapevolezza e l'abilità cognitiva per le attività della cura di sé con punteggi maggiori corrispondenti a maggior carico assistenziale

— Valutazione del livello di coscienza anche con l'ausilio di scale di valutazione: GOS, Glasgow out come; LCF Level of Cognitive Functioning, che valuta il livello cognitivo- comportamentale che accompagna le varie tappe di uscita dal coma; CRS-R Coma Recovery Scale –Revised, che ha lo scopo di supportare

una diagnosi differenziale tra stato vegetativo e stato di minima coscienza.

— I pazienti che si trovano in una condizione clinica classificabile in un GOS di 3-4 che corrisponde ad uno stato vegetativo o stato di minima coscienza, cioè un paziente che sta ad occhi aperti ma non ha alcuna consapevolezza di sé o dell'ambiente che lo circonda o comunque è in grado solo in maniera non costante e sporadica di rispondere a stimoli esterni.

— I Pazienti con GCLA con un LCF compreso tra 1 e 5. Il gruppo 1-3 comprende coloro che hanno una reazione incostante o assente nei confronti di stimoli esterni; il gruppo 4 è caratterizzato da uno stato di agitazione e confusione, con memoria a breve termine e attenzione selettiva inesistente. Il soggetto con LCF 5, invece, presenta una certa capacità di rispondere a domande semplici, ma se i comandi sono complessi, le risposte sono non intenzionali, casuali e frammentarie rispetto allo scopo.

— Alla valutazione clinica, alla osservazione, allo somministrazione delle scale di misurazione segue la formulazione in team multiprofessionale del progetto riabilitativo individuale con relativi programmi. Il Progetto è condiviso con la famiglia già nel corso della prima riunione di team multiprofessionale allargata. La necessità di nomina di un ads viene comunicata alla famiglia nell'ambito della riunione di equipe. Sarà, poi, l'assistente sociale del CRT a supportare la famiglia in questo percorso.

— Il Medico prepara una relazione medica conoscitiva sulla storia clinica del Paziente e sulla Sua condizione clinica attuale. Nella relazione viene espressa la diagnosi e le capacità cognitive e relazionali del paziente.

— La relazione con il "Modulo richiesta parere nomina amministratore di sostegno" viene validata dal Direttore della Macrostruttura di riferimento, nel nostro caso dal responsabile del Presidio Ospedaliero della Gruccia. Viene trasmessa al responsabile della U.O. Medicina Legale, che presa visione del fascicolo, formula il parere e incarica uno o più dirigenti medici della predetta U.O alla trattazione dell'istanza. La richiesta viene inoltrata, entro e non oltre 48 ore, all'Ufficio del Giudice Tutelare territoriale competente, ovvero al Tribunale della zona di residenza o domicilio del paziente. Una copia viene rimandata, per conoscenza, tramite fax, alla struttura richiedente.

— Recepita la decisione del Giudice Tutelare, la predetta U. O. provvede ad archiviare la pratica. Il tutore nominato dal Giudice ci consegna la nomina e copia viene allegata in cartella clinica.

RESULTS

Dall'agosto 2010 abbiamo ricoverato in reparto Gravi cerebro lesioni acquisite 160 pazienti.

Abbiamo inoltrato richiesta di parere nomina di amministratore di sostegno alla UO di Medicina Legale per 99 pazienti. Di questi abbiamo ottenuto 72 nomine.

I tempi di attesa per la disposizione della nomina sono andati da un minimo di 1 giorno ad un massimo di 72 giorni.

La presenza di un ads ci ha consentito di eseguire interventi invasivi programmati. Un esempio: abbiamo posizionato la PEG a 16 soggetti con consenso al posizionamento da parte del soggetto individuato dal Giudice Tutelare. Le procedure eseguite in regime di urgenza non hanno seguito l'iter della nomina di ads, ad esempio nel 2010-2011 sono stati sottoposti a trasfusione in regime di urgenza 20 pazienti.

CONCLUSIONS

I differenti orientamenti emersi in giurisprudenza sull'applicabilità della legge n 6/2004, testimoniano l'attenzione degli operatori intorno ad un provvedimento che investe la sfera del diritto e della medicina e che, nella sua applicabilità, ha sicuramente toccato alcune questioni di fondo: il rapporto tra cittadino e il potere pubblico, i limiti di ingerenza nella sfera dei diritti della persona umana. Emerge la responsabilità dei servizi sociali e sanitari nei confronti del cittadino che ha diritto ad assistenza e protezione; la responsabilità del medico nella scelta delle cure e terapie, in caso di urgenza, verso la persona incapace che non può esprimere il consenso, e la legittimità del potere conferito all'amministratore di sostegno di assumere tali decisioni. In questo modo l'ads assume su di sé, dopo aver espresso il consenso informato, quella responsabilità che prima incombeva sul medico.

Nelle unità di riabilitazione, tra i vari problemi che si presentano quotidianamente, vi è quello di dover praticare una serie di trattamenti medici, invasivi e non, a pazienti non competenti, ovvero soggetti che non sono ancora stati dichiarati giuridicamente incapaci, ma che clinicamente lo sono, come ad esempio pazienti in stato vegetativo o più in generale gravi cerebrolesi.

Molti trattamenti non possono essere ascritti alla categoria degli atti salva vita o meglio detti atti di urgenza, condizione in cui il medico ha l'obbligo giuridico di intervenire a prescindere dell'esistenza di un consensoinformato.

Gli interventi medici non riconducibili ad interventi salva vita, che abbisognano di un consenso che il paziente chiaramente non può dare e che, se non è un rappresentante legale o un amministratore di sostegno, neanche il familiare può dare, impongono al sanitario il potere/dovere di presentare ricorso al Giudice Tutelare per la nomina di ads.

Il giudice tutelare può, una volta ricevuto il ricorso, adottare anche d'ufficio "i provvedimenti urgenti per la cura della persona interessata e per la conservazione e amministrazione del suo patrimonio".

Il CRT Spa considera non solo lecito e legittimo il ricorso ex art 405 cc da parte dei sanitari, ma addirittura doveroso.

La tutela della salute costituisce, secondo la Costituzione Italiana, uno strumento di dignità sociale dell'individuo, soprattutto se quest'ultimo è da considerarsi soggetto incapace, realizzando così il "rispetto della persona umana".

La richiesta al magistrato di provvedimento autorizzativo da parte del sanitario di procedure mediche rispondenti a criteri condivisi e consolidati riconosciuti a livello nazionale e internazionale, indicati come indispensabili nella procedura per la presa in carico dei pazienti in stato vegetativo, rispecchia piuttosto fedelmente quella sinergia tra figure professionali ontologicamente diverse, volta alla tutela della persona e dei diritti inviolabili che essa stessa pretende per il solo fatto di esistere.

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Plagiocephaly: most frequent clinical pictures (103 cases); indications for prevention and treatment

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SUMMARY

Plagiocephaly is an asymmetry of the head, which is especially noticeable by observing the head from above. Various causes are recognised, but in our opinion the most common one is the positional. Its qualitative and quantitative incidence has increased after children are made to sleep in supine position to prevent "cot death (SIDS)".

Purpose: Assess the prevalent laterality of the crushing; the greatest restriction in cervical rotation and inclination and its relationship with the laterality, type of delivery, the associated alterations, the age of entry to the fkt, treatment timing and results.

Patients and study method. 103 cases that reached the O.U. Functional Recovery and Rehabilitation of Feltre from 2003 to 2010 have been assessed. The following issues were considered: sex, age of entry into service, type of delivery, crushing side of the occipital-temporal-parietal, the side that had the greatest restriction in rotation and then in passive cervical inclination (these were then related with the side of plagiocephaly), alterations especially associated with orthopedics, the results of fkt treatment and timing of fkt treatment to achieve a relatively stabilized framework.

Results. The right-back, cranial crushing is clearly prevalent, almost always associated with deficits of left neck rotation. This implies a positional source (the child keeps the head turned to the side which is more convenient or does not bother). 53 were born not in a physiological way (vacuum, dystocia, 35 cesarean etc.); 26 had f*et al.*terations, 15 to the SCOM, etc. If early treated, in general it resolves quite well. Cases of greater failure are those that came to our attention after 5-6 months of life.

Considerations: The sustained asymmetric rest, over time, causes or aggravates this condition. It is therefore recommended that the plagiocephaly and cervical inclination-rotation deficits are diagnosed and treated early. It is also very important to vary the position and keep the child prone when awake, while an adult closely watches him/her. It should be emphasized that this is not just an aesthetic problem, but an asymmetry that may causes scoliosis and alter many important functions (vision, hearing, chewing, swallowing, breathing, action of the cranial nerves etc.).

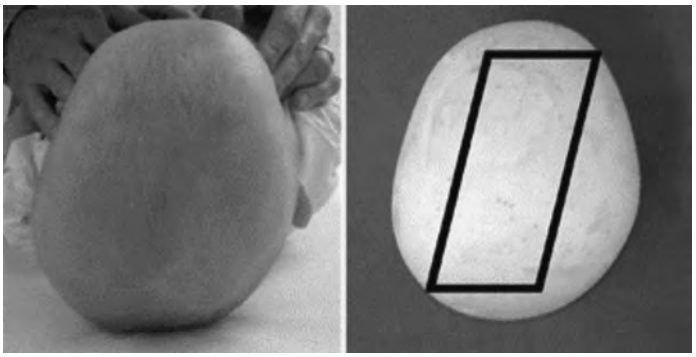

Figura 2. — Manipolazione dorsale.

INTRODUCTION

Plagiocephaly (head oblique, parallelogram, from the greek plàgios=oblique, kefalè = head; in English "twisted skull") is an asymmetry of the head, which is especially noticeable by looking the head from above. Flat parts are noted, usually in correspondence to the semi-occipital part, associated with an ipsilateral frontal protrusion and a flattened frontal bone on the opposite side. It may depend on several factors: elderly primipara, prolonged delivery, skeletal abnormalities of the mother, twin births, flawed fetal positions, <amniotic fluid, big head (diabetes). It can also result from a craniosynostosis (premature fusion of the skull's sutures; in particular, the unilateral synostosis of the coronal suture causes a frontal plagiocephaly, and that of the lamdoid semisuture induces a rear one). Clinically, in the important cases can be noted: obliged positions in the cradle, difficulties in falling asleep, restlessness, crying, convulsions, those with posterior plagiocephaly may hold difficulties in breast feeding, noisy breathing, etc. A cause, on which we can effectively act at a preventive level, is the recommended position to reduce the so-called "cot death". In 1992 the American Academy of Pediatrics (AAP) published recommendations for healthy children to be put in bed, resulting a reduction in cot deaths (SIDS) of more than 40%. In 1997 the Italian Society of Pediatrics recommended supine position for sleep. The "cot death" is favoured by the prone position during sleep (most of the dead are found prone in cots, even if they had been put to the side). For this reason, after leaving the neonatal care, pediatricians advise parents to make the baby sleep on his/her back. Such advice certainly is valuable, as it manages the avoidance of many of these serious events,

but it has definitely helped to increase, both in number and gravity, the positional plagiocefalias [1], [2], even for lack of control of the baby's head and trunk.

We have been working for 33 years at a children RRF service and over the last 10 years we have noticed, along with the rest of the world [1], a significant increase in the quantity and quality of this disease. In our opinion, most of these frameworks recognize primarily a mechanical cause, positional. Almost always there is a lack of passive contralateral rotation to occipito-temporo-parietal flattening, while ipsilateral rotation is usually free. We know that the fibrous tissue, if not systematically elongated, tends to retract. Probably, a slight limitation of neck's contralateral rotation causes the infant to sleep on his/her back, by rotating the head towards the more free side, on the one that presents the least resistance (or discomfort). It is also possible that the rotation of the head is primitive (for the weight, attitude, asymmetrical cushion, or related to the arrangement of light, room, toys, etc.) and that the restriction is secondary, or vice versa by muscle-ligament-bone stress before, during or after birth. Probably, these situations both contribute (feeding each other), to gradually shaping the framework. The skull, especially in young children, is deformable and a relatively fixed and prolonged pressure progressively tends to crush the parts subjected to this pressure, modeling thereafter an asymmetrical skull. If not discovered and treated promptly, the disease tends to become fixed and create important and difficult to treat cervico-cranio-facial asymmetries. It should also be considered that, as we shall see, this asymmetry also involves muscles, ligaments, bones, etc. These, through the piezoelectric effect, can help to lead, support, modify and worsen the framework (for this reasons, treatment should always be early, comprehensive and analytical). It must be clear that this is not just a cosmetic problem, but a pathogenic and potentially dangerous situation for different organs as well as the body in general.

PATIENTS AND STUDY METHOD

An overhaul of the cases from 2003 to 2010 was made in the OU of RRF of Feltre (BL) (90% of the cases was seen and treated from 2005 onwards). All the cases with a significant plagiocephaly were considered (although, in our opinion the slightest beginning of this disease should be promptly reported and treated). Excluded from the research were the ones after the year of age and those of central neurological origin (PCI), with fractures of the clavicle, abnormalities of the cervical spine etc. Were evaluated: A) sex, B) age of access to the service (which, given the relatively short waiting times for these conditions, virtually coincides with the time of diagnosis, with the gap of 0-15 days), C) type of delivery, D) it was then rated the side of plagiocephaly, i. e. where the skull was more flattened posteriorly, E) it was also considered the side on which the restriction of the cervical spine in passive rotation was more significant (it has been reported with + if the difference was between 10° and 15 °; with + + if it was between 16 and 25 °; with + + + if it was> 26 ° (through goniometer, the degrees of difference between the two sides respect to the plane of the bed was calculated), and then F) the inclination (the same criterion was used with regard to degrees; the inclination was calculated with a goniometer respect to the clavicle). It should be noted the existance of an inevitable margin of error in this assessment, G) these parameters were then compared among themselves and with the side of plagiocephaly, H) alterations, mainly orthopedic and related were reported, I) the results of FKT treatment were then assessed, considering: null = 0, slight = 1 (when a significant static and dynamic cervico-cranio-facial asymmetry and / or a major cervical joint limitation persisted); discrete = 2 (when the asymmetry-restraint was more modest but well-appreciated); good = 3 (the asymmetry-articular restrictions were very mild) and fine=4 (the framework was considerable near normal). The significantly but still evolving frameworks were not reported, L) the timing of treatment was reported (in this case were only assessed the months needed to reach a relatively stable framework, with treatment occurring 1-3 times a week; in fact children were not discharged but treated with FKT once every 15-45 days and assessed by a physician every 2-4 months). In this parameter, to be considered are also the timing of disease and leave of FKT and of the baby, thus data are only indicative.

RESULTS

A) We assessed 103 children (59 m, 44f).

B) DATE OF THE FIRST VISIT AND OF THE BEGINNING OF THE TREATMENT: The date of first visit and of treatment was within birth and 9 months. 25 have come from birth, 9 by 1 month, 19 within 2 months, 24 within 3 months, 8 within 4 months, 8 by 5 months, 3 by 6 months, 3 by 7 months, 3 by 8 months, 1 by 9 months.

C) TYPE OF BIRTH: 51 had had natural childbirths; 35 cesarean sections (of these 13 twins including 5 preterm births), 9 were born with suction cup, 2 had had preterm birth, 3 had had distocic shares, 1 had had a prolonged delivery and 1 was born with a bit of cord around the neck.

D) OCCIPITAL CRUSHING: 5 cases showed a pretty central crushing; right crushing 62; left 31; the other 5 had an asymmetry of the face or a predominantly anterior cranial.

E) LACK OF ROTATION: 11 had a rotation without significant articular restrictions or asymmetries; 53 had a left deficit of rotation (14 = 3 +, 12 =2 +; 27 =1 +), 39 showed a lack of right rotation (8 =3 +, 10 =2 + and 21 =1 +).

F) LACK OF INCLINATION: 18 showed a deficit of left side bending (3 = 3 +; 2 = 2 + and 13 = 1+). 42 showed a deficit of right side bending (7 = 3 +; 5 = 2 +; 30 = 1+). 43 had no appreciable deficiency or asymmetry of passive side bending.

G1) LIMITATION OF ROTATION-SIDE BENDING LIMITATION RATIO: 4 had ipsilateral limitation of rotation and side bending. 52 had an opposite limitation. Only 4 had a free and symmetrical joint movement and had no limitations in passive rotation and side bending. 4 showed only a deficit of side bending with symmetric rotation.

G2) REAR OCCIPITAL COMPRESSION-LIMITATION OF ROTATION RATIO: 5 had an asymmetry of the face primarily or predominantly anterior and 5 had a posterior central crushing. 11 did not have asymmetry of rotation. Only 2 children had a joint limitation in rotation to the ipsilateral occipital flattening, the other 82 had contralateral limitation.

G3) OCCIPITAL REAR COMPRESSION-LIMITATION OF SIDE BENDING RATIO. 5 had an asymmetry mainly in the face or front and 5 had predominantly a central occipital flattening. 43 had no asymmetry of inclination. 7 patients had an occipital flattening contralateral to the limited inclination. 40 showed a limited ipsilateral inclination to crushing.

H) ASSOCIATED DISORDERS. 18 showed valgus-talipes foot/feet (almost all positional and resolved relatively well with the treatment). 3 had a supinated foot, 1 adduct-supinated; 4 metatarsal adduction, 12 hematoma of SCOM, 3 thickening or tension-retraction of the SCOM; 1 had ligamentous laxity; 1 immature hips (pants); 3 motor delay or hindrance; 1 macrocephaly; 1 microcephaly with motor delay, 1 Duane syndrome, 1 a dislocated hip with lower limbs hypotrophy, 1 no hand and 2/3 forearm left, 1 weakness of an arm at birth. It should be noted that some of these alterations were associated in the same case: therefore the number of cases with associated alterations is a bit less than that resulting from this statistic.

I) MONTHS OF TREATMENT WITH FREQUENCY OF 1-3 TIMES A WEEK: 1 case was treated for 24 months, 2 for 19 months, 3 for 18, 1 for 13, 12 for 12, 2 for 11, 4 for 10, 8 for 8 months and 8 for 7 months, 10 for 6, 4 for 5, 6 for 4 months, 7 for 3, 3 for 2 months, the others are still being treated, they still have significantly evolving frameworks (apparently, the demarcation line is not clear). 2 discontinued the treatment for autonomous decision.

L) RESULTS: 38 children had an outcome = 4. 42 reported a score = 3. 8 = 2. 1 = 1. 6 children were prescribed the collar because the improvement, with only FKT was insufficient, while the muscle retraction and the attitude of the head, often important, were slightly modified by treatment. The other cases were not classified because they were not stabilized and still improving under treatment.

CONSIDERATIONS

A) It should be noted that the number of children that come in 6-8 years is not negligible and as mentioned above, has increased after the supine sleep position was prescribed as to prevent cot death. Also [1], [2], [3] confirm the fact that there is the prevalence of male: the male-female ratio is 2:1 or 4/3. According to [1] this is due to the tendency of boys to be more hypotonic and less active than girls.

B) It must be stated that sometimes, if the child was assessed in neonatology, it was for associated alterations that were different from the plagiocephaly, usually for dysfunction of feet (6 cases) or hematoma at the SCOM (2). Plagiocephaly was not reported frequently as to test and treat disease. As seen, the peak inflow to the service is 2-3 months after birth (i. e. it takes some time for this framework to establish itself and become evident; this confirms the positional hypothesis of this disorder. For [3] the cranial deformations establish themselves from 48 hours to 7 weeks of life.

C) Less than half of the cases had a natural childbirth. 45 children were born by caesarean section or suction cup; others had a distocic birth; This suggests both an important stress of structures at birth and a positional hypothesis in uterus (13 twins), with retraction of the structures even before birth. From this beginning, the position will probably get worse and makes the disease more evident over time.

D) Clearly prevails (2:1) the posterior right crushing. [3] Confirms this fact and [2] found 48% right and 25% left plagiocefalies.

E) A left passive rotation deficit clearly prevails (often also active, since usually the passive rotation deficit on one side is joined by an attitude of supine head rotation on the other side and by a deficit of active rotation towards the limited one). Data in this regard from Petronic I. and colleagues [4] on 980 children with myogenic torticollis without hematoma of SCOM, are similar to ours and confirm the prevalence of right laterality. These authors cite other Chinese works that confirm this laterality. Even data of [2] on 133 cases confirm this laterality. As we shall see, for us this is very interesting from the posturological point of view.

F) A right passive side bending deficiency clearly prevails.

G1) It should be noted that the limited side bending is almost always opposite to the limitation of rotation (probably there is a major involvement of upper trapezius and SCOM that induce contralateral rotation and ipsilateral head side bending and limit the opposite directions).

G2) There is a clear prevail of the framework of posterior occipital-temporal-parietal crushing opposed to restricted rotation and ipsilateral to the favourite rotation. This argues further for a positional hypothesis (i. e. the child always rests on the occiput where the head rotates more). [2] Present similar data to the ones we have and confirm the contralaterality.

G3) There is a predominance of the ipsilaterality of posterior crushing with more limited side bending. It should be noted that the inclination is a bit more difficult to assess than the rotation and the margin of error is greater.

H) The great number of associated dysfunctions should be noted. Many of these, especially feet and SCOM disorders, indicate a postural cause/contributing cause in uterus (lack of space) or neonatal. [2] found only 10.52% of orthopaedic problems associated (mainly on feet and hips).

I) The treatment of 1-3 times a week, as we see, takes several months; later it gradually is thinned out. The controls continue until 1.5 to 3 years and even after, if necessary. The family commitment as well as the Service is quite important. Our data are similar to those of [4].

L)Overall, almost 80% of cases have had a significantly positive outcome. Almost all children who have worn the collar had come to our attention after the 5th month. The children that come after the 5-6th month, generally from other Health Units, have almost always had worse outcomes from treatment. Our data are similar to those of [4]. We think it's important to treat the children as early as possible and to continue treatment until the framework is open to improvements. It is important to solve as soon as possible the muscle-bone-ligamentous asymmetry as giving freedom of movement to the neck, the location becomes less fixed; also the piezoelectric effect induces more symmetrical effects and in this way the framework stops its potential evolutivity and tends to resolve, sometimes quite early.

The relationship plagiocephaly-restriction in rotation clearly arises, and this confirms our hypothesis on the origin of this mechanical-postural disorder. The fact that there is a prevalence of right plagiocephaly with joint restriction in left rotation is very important for us. The passive cervical rotation was assessed in several works, on many cases, both supine [5] and while sitting [6], with the Cervical Measurement System: [7] both sitting and with arms folded behind the chair and we always found significantly greater joint excursion to the right. In these activities, we thought that this recurring clear difference was due to the common deficiency of convergence of the left eye (usually non-dominant eye) [8], but according to data of this work, we reconsider the above statements. The fact that the newborn baby already prefers a supine position with head rotated to the right indicates a lower tension, more comfort in this direction; long before the eye receptors are accrued. Often the baby leaves the birth canal turning the head toward the left shoulder. In Manual Medicine, we state that the joints move better toward the directions of the lesion (i. e. towards the direction, exaggerated, that has caused the dysfunction) and less toward the opposite directions. It is likely that, given the stress of childbirth, traction occurs performed exaggerating this directions and this causes dysfunction that if incorrect tends to persist and sometimes to get worse if the baby is put always supine.

The implications of this biomechanical and postural imbalance, especially if untreated, are extremely large and complex; the discussion will necessarily be very reductive.

It is now useful to briefly examine the asymmetry of the joints and muscles necessarily involved, as they have to be rebalanced with care.

— **Occiput-C1**. The occiput, which articulates with the atlas through two oval convex facets in all directions (that fit exactly to those oval concave in all directions of the atlas) with an axis forward-inward directed, probably is deficient on the last degrees of left rotation. In practice, the left condyle fails to go totally back on the left lateral mass of C1 and / or the right condyle fails to go completely forward on the right lateral mass of C1. At this point, e. g. the right rotation of the occiput, which makes the occiput left condyle going forward, causes the left ligament *occipito-odontoid lateral* twisting around the odontoid; this puts it in tension and causes the same ligament attracts the left occiput toward the tooth,

and then towards the midline. Such induces a shift towards the right and a left inclination of the occiput on C1. Here, in addition to the tension difference of the occipito-odontoid lateral ligament, probably the *rectus anterior minor* (which induces bending and rotation-tilt ipsilateral of the occiput) is a bit more shortened by the part of the rotation and more tense in the other one (if the rotation prevails on the inclination), the *lateral rectus* (which induces a slight tilt to the ipsilateral side) is more tense on the right, the *rectus minor posterior* (which causes contralateral rotation of the occiput) is more stretched on the side of the rotation and shorter on the other; the *oblique minor* of the head (which rotates the occiput contralaterally) is longer by the side of the rotation, more retracted in the other one. All suboccipital structures (ligaments, membranes, nerves, etc.) are probably asymmetric. It is possible that the different chronic stress also tend to modify the anatomy of these structures (piezoelectric effect, etc.).

— **C1-C2**. Even C1-C2 is affected by this asymmetrical rotation. It is possible that the tooth is slightly asymmetric (the difference in traction by the above lateral occipito-odontoid ligaments can also change its anatomical structure, through the piezoelectric effect?) and that the rotation towards the limited side does not take place completely. It is likely that an inferior facet of the lateral mass of C1 (convex from front to back, as the upper facet of the lateral masses of the axis, which has a radius nearly equal), is not able to go totally down-backwards respect to the adjacent articulation of C2, while the other facet of the lower lateral masses of the atlas is not completely able to go down-forward upon the adjacent facet of the axis. Surely, this limitation is more important than that of C0-C1.

Probably the rectus major posterior, and the oblique major posterior, making an extension, a tilt and a rotation ipsilateral to the side of the rotation, are more shortened than the contralateral in the side of rotation (which normally prevails on the inclination).

— The underlying vertebrae, **C3-C7** have a totally different physiology; given the presence of the unciform processes, tend to make a rotation associated with an ipsilateral inclination. Undoubtedly, this asymmetry can influence their anatomical structure and function.

— It is worth mentioning the **muscle chains**: these vary depending on the authors e. g. [9], [10], [11] etc. We mention the opinion of Busquet L. [12]. This author believes that in the cervical spine, there is a superficial and a deep cross chain. We quote the main muscles of the first. 1) The omohyoideus moves from the scapula to joide and it continues with 2a) the opposite mylohyoideus, which goes on the inside of the lower jaw and 2b) the opposite stylohyoideus which completes internally this crossed system, towards the styloid process of the temporal. Regarding to the superficial cross-system atlas-axis-head, he states that this is formed 1) by SCOM and 2) the suboccipital muscles (major and minor obliquus, rectus posterior major and minor).

The deep cross system has the scaleni muscles as the most important [their actions are controlled, the rear of the cervical spine, in the sagittal plane by complexes, in the frontal plane (Lateroflexion) by longissimus cervicis and ilio-costo-cervicalis; in the horizontal plane (rotation) by splenii]. It is probable that the chains directed from the left shoulder and trunk to right cranial-neck structures are more extensible than the contralateral ones.

— Many other structures are involved in this asymmetry. Apart from the muscles of the deep plane and the most superficial ones, furthermost of the nuchal muscles are directed obliquely downward, inside and rear simultaneously and determine extension, tilt and rotation from the side of their contraction.

1) complexus: A) the major (from first 6 dorsal-last 4 cervical transverses, and spinouses C7-T1 to the central part of the occipital curved line) gives extension-slight tilt ipsilateral: its physiology is asymmetric. B) the minor (from transverse processes of C4-T1 to the back side of the mastoid and occipital curved line) giving ipsilateral extension-rotation-inclination, is perhaps shorter in the upper part of the rotation and / or tilt. If these directions are opposite, add or subtract their different lengths.

2) The splenius: A) capitis (from last 6 cervical spinouses to outer parts of the occipital curve and postero-superior part of mastoid; it gives ipsilateral extension-rotation-inclination) is perhaps shortest on the upper part of the rotation and / or tilt. If these directions are opposite, add or subtract their different lengths. B) Cervicis (from first 4 dorsal spinouses to transverse processes of first 3 cervical v.) (asymmetric physiology).

3) The levator scapulae (from upper-inner angle of the scapula to first 4 cervical transverses). Giving ipsilateral extension-rotation-inclination, top is perhaps shortest on the rotation part and / or inclination. If these directions are opposite, add or subtract their different lengths.

4) The longissimus cervicis: from first 5 dorsal transverses to those of the last 5 cervical (asymmetric physiology).

5) The cervical part if ilio-costo-cervicalis: from the corners of 3rd-6th rib to transverses of C4-C6 (asymmetric physiology). Similar considerations are made for the cervical longissimus thoracis.

— The scaleni (rotate and tilt the head ipsilaterally): Regarding the above insertions, perhaps they are shorter on the side of the rotation and / or tilt. If they are opposite, add or subtract their different lengths.

— The deep muscles [transverso-spinalis (come up until to C2 spinous), intertransversarii, interspinalis etc.] are and work asymmetrically.

— The surface layer of the neck muscles has a crossed direction relative to the muscles of the intermediate layer, that is oblique in low-forward-out; they don't act directly on the upper cervical spine, but on skull and suboccipital spine to determine extension, ipsilateral inclination and opposite rotation [13]. The left upper trapezius raises the stump of the ipsilateral shoulder (fits on lateral 1/3 of clavicle and scapula), lowers the occiput ipsilateral and gives contralateral cranial rotation. Even the S.C.O.M. rises the 1/3 internal of the ipsilateral clavicle, lowers ipsilateral mastoid-occiput and gives skull contralateral rotation. The upper trapezius and S.C.O.M. then rotate the head contralaterally and tilt it ipsilaterally; if retracted limit, among other things, the torsion ipsilateral and the opposite inclination. They seem to have a very important role in this framework.

It is relevant to say that it is not just a cosmetic problem, but a situation, potentially dangerous and pathogenic in different organs and for the body in general.

— RIBS. It is likely that this situation induces a greater retraction, ipsilateral to the inclination, of the scaleni; this can lead to dysfunction in superiority (i. e., it tends to hold them upwards hindering their lowering) of the first 2 ribs, especially of the first one.

— SKULL: The bone is shaped by piezoelectric effect. According to our data, the support of the condyles of C1 is also asymmetrical and even muscle, fascial and ligamentous tension urge the skull in a significantly asymmetric way. The anatomical structure of the skull can be affected and is likely to grow asymmetrically. The implications are therefore enormous. According to the osteopaths, an increased tension of the upper trapezius (that fits on the external occipital protuberance and on the inner 1/3 of higher occipital curved line) induces a flexion of the occiput (and therefore of the spheno-basilar symphysis) and an external rotation of the temporal (the position and the "motion" of this bone is conditioned by occiput). Its asymmetric tension can cause twisting or other complex changes to the spheno-basilar suture and skull. An increased tension of S.C.O.M. gives a tension dysfunction of the temporal [14], [15], [16], [17-18] and restriction of motility of occipito-mastoid suture with possible impact on the occipito-mastoid hole (through this exit from the skull the jugular vein, the cranial

nerves IX, X, XI, the posterior meningeal artery, etc.). The tension of this muscle associated with that of the splenius cervicis and complexus minor (which are inserted in the bridge, as SCOM, both on the mastoid and the occiput), tends to stress this suture and this important foramen. An example of bone deformities caused by these muscles (as well as by asymmetric pressure) is visible in the skulls of children with torticollis myogenic; traction especially of SCOM alters the structure of temporal and occiput and gives an important asymmetry on the whole skull.

— The stomatognathic system is heavily influenced by this situation; many implications elude us, or appear difficult for us to understand. The supra and infrahyoidal muscles have asymmetrical lengths and tensions: these affect the static and dynamic of the tongue (joglossus, styloglossus, etc.), mandible (mylohyoideus, geniohyoideus, digastric etc.), skull (digastric, stylohyoideus, etc.), shoulder (omohyoideus), pharynx, larynx, etc.

— TMJ: In this condition the ear on the side of flattening usually is advanced compared to the contralateral. The temporal bone is dependent mainly by occiput and in this disease is almost always involved in an important matter. It contains the glenoid joint. Given the strong asymmetry of these bones, it is inevitable that the orientation, the shape, the internal relations, and then the physiology of this cavity (and thus of the jaw) tend to be not perfectly specular. The maxillary bones instead are dependent mainly by the sphenoid. This bone, although not directly involved in this unequal pressure, is almost always asymmetric as it compensates the important anatomic abnormalities of adjacent bones. For this and for compensation, even the maxillary bones are often found to be not symmetrical. The teeth are placed on the maxilla and mandible. It is inevitable that this situation predisposes to orthodontic problems and before aligning the teeth and correcting these situations, the orthodontists should always consider the totality of the framework, at least on the head.

According to [19], Ranaudo P.[20-21], [22] etc. the upper trapezius is in relation with the ipsilateral lateral pterygoid (the lower part of it opens the mouth and protrudes the lower jaw when it contracts bilaterally; if it does unilaterally diverts the mandible to the same side), while the SCOM is in relation with the ipsilateral internal pterygoid (participates in the closing of the mouth; if it contracts unilaterally diverts the mandible from the opposite side). The mandible tends to become asimmetrical and every function at this level may be involved in this asymmetry.

— **Postural balance**. It should be noted that many of the involved structures (suboccipital muscles, SCOM, superior trapezius, hyoidal muscles etc.) are essential for postural balance, especially of the head, which must ensure the optimization of essential functions for survival (vision, hearing, balance provided by the semicircular canals, chewing, swallowing, phonation, breathing, neck and head circulation etc.). It is evident that the need to ensure the horizontality of the look, of the semicircular canals etc., forces the entire body to adapt to these primary functions, with these asymmetric tensions.

— Eyes: these are inserted into the eye sockets that this disorder tends to asymmetry, with no specular eye muscle insertions etc. This may cause major alterations to the vision (eyeballs anatomically and physiologically asymmetrical with astigmatism, imaging at different depths, etc.). The vision is important for posture (medial longitudinal fascicle etc.). The ocular dysfunctional receptor alone can cause major changes in posture throughout the body (scoliosis, muscle tone and body posture asymmetrical, various pains, etc.).

— It is frequent (also in the "normal" population, look at x-rays, CT scans, MRI brain, etc.) the asymmetry of the upper airways (nasal passages, mouth, lips, tongue, pharynx, larynx, etc.) which, among other things, may cause a different swallowing, phonation, static and dynamic position of the hyoid etc. and a different airflow with perhaps a different lung expansion and perfusion etc.

— The plagiocephaly can be, among other things, a predisposing condition for scoliosis, often classified as idiopathic, through various mechanisms, which are difficult to divide among themselves and outline; here we can only hint to enable some reflection. These may be: 1) the static and dynamic cervical asymmetry: this requires compensations under and as well as above. 2) The asymmetry of the occipital condyles and their support on the lateral masses of the atlas (induced, inter alia, by the piezoelectric effect): for keeping, inter alia, the horizontality of the eye, requires important adaptations of the whole body. 3) The asymmetry, among other things, of small suboccipital muscles which are of major importance in regulating balance, posture etc. (Controlling the structure of the skull, vision etc. compared to the cervical spine). They have small motor units, with few muscle fibers, as the muscles of the hand. 4) It can probably also participate in the asymmetry of the labyrinths, of the organ of hearing, as well as the eyes, upper respiratory tract etc as mentioned above. We stop here, but possibly contribuiting mechanisms are much more numerous and complex and require a deep analysis (in this case it is a predominantly descending dysfunction).

CONCLUSIONS

Plagiocephaly is a pathology that should not be neglected; as previously mentioned, this is not just a cosmetic problem. According to [23], this condition does not cause mental retardation or neurological deficits and is mainly a cosmetic problem. However, according to Kordestani RK and Pankal J., cited from [3], this condition may result in a cognitive retardation and psychomotor retardation in about 40% of cases, hearing problems (Balan P), visual (Siatcowski RM)[3].

It should be diagnosed as early as possible: if done early, usually it resolves well and leaves no consequences, while if overlooked or neglected, it may predispose also to significant diseases. In the cases of difficult childbirth, prolonged extraction of the head, turns of cord around the neck, macrosomia, sacral position, suction cup, cephalohematoma, etc., a test is necessary at birth but also after 2 weeks-20 days, by the neonatologist or Pediatrician, to verify tone, symmetry, motility, rotation of the head and the presence of hematoma or retraction of the SCOM. In this case, promptly, the baby will be entrusted to the care of physiotherapy.

From the Paediatric standpoint, it should be noted that in recent times, precisely in relation to the increase of cases of plagiocephaly, which certainly can be placed in relation to the supine position of infants for evidence of the substantial reduction of the risk of "cot death "(evidence A), were actually suggested some changes to this behavior:

It is not recommended to sleep in prone position; the child can remain in prone position or right or left side for 1 hour, several times a day, during the day, under parental control, especially for children who tend to regurgitate or have a real, gastro-aesophageal reflux for which there are specific placements anti reflux. In this respect, it must be stated that in the passage in the birth canal, there is the possibility of injury to the nose (nasal bones and septum) by compression and/or crushing; also the occipital bone can undergo this trauma. It should be noted that the hypoglossal nerve (XII) exits the skull piercing the occiput. An alteration of this bone can lead to functional impairment of this nerve with dysfunction of the muscles of the tongue, swallowing etc. Also trauma and/or dysfunction of the vagal nerve at the level of the petro-occipital foramen, as already said, can induce cough, regurgitation etc.

If mild and diagnosed in the first days of life, for some it is enought the postural or positional approach, which involves the use of pillow "sleep safe" to keep head and neck in a suitable position. We always prefer to treat these cases also because it should be kept

in mind that the brain doubles its volume in the first 7 months of age and triples by 24 months and reached the 80-90% of the adult volume around 3 years of age.

If there is a retraction, a specific limitation, eg in left rotation, it is useful to put the child prone with the head rotated to left if possible. This helps keeping elongated the structures (muscles, ligaments, fasciae etc.) that tend gradually to shrink. This antagonizes effectively the fix and the progress of retractions and cranial asymmetry, and it is also useful for the overall development of the child since both phylogenesis and ontogenesis pass through these stages. If there is a specific retraction and difficulty to actively rotate the head in one direction, it is wise to position light, objects, toys, (and calling parents) etc. in a way that the child actively turns the head towards the side where rotation is limited. In supine position can be useful to place a pillow so as to prevent the rotatory fall of the head towards the side that worsens the disease. From the FKT point of view, it is especially important rebalance muscles, paying special attention to stretching of the retracted structures. They are powerful ties that alone can lead to or support the framework. It is also possible to effectively model the skull manually, especially at an early age, but we prioritise working on muscle-ligament retractions. It is then important to carry out techniques commonly used in FKT for the neuromotor development. In cases of not satisfactorily progressing or when no improvement is visible during treatment and threatening to leave important sequelae (in sidebending, with large muscle retraction, significant craniocervical asymmetries etc.), it is useful to prescribe a soft correction collar to be worn several hours daily; there are usually no problems of tolerance or other inconveniences. It should be stressed that these cases are the ones that virtually always come to our attention later. Currently, we have no experience of helmets [24] and adjustable bandages, used mostly in Spain and USA. In severe cases, surgical approach may be used; by Rilliet R. *et al.* [1] they are not recommended because there is the danger, among other things, of bleeding and recurrence. Until now, we have never used the last two measures.

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1st rib: dysfunction with expiration limitation (305 cases). Relation with the "shoulder pain" (127 cases)

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ABSTRACT

The 1st rib is atypical; it holds close relations with important structures: 1) muscle insertions: scalenus medius and anterior, serratus posterior superior, iliocostalis, serratus anterior, subclavius, external, middle and internal intercostal, levator costarum. 2) Vessels: subclavian vein and artery; internal mammary artery, the truncus arteriosus cervico-intercostal, posterior branch of the subclavian, bifurcates at the neck of the rib and supplies: deep cervical artery and superior intercostal artery. 3) Many ligaments, including the internal and external costopleural. 4) It articulates with the body of D1 and with the transverse of D1. 5) Nerves: stellate ganglion. The neck rib lies in a fork made by the anterior branch of the root C8 and the anterior branch of D1 (which gather in front of it). The phrenic nerve descends on the anterior face of the scalenus anterior and passes between the subclavian artery and vein. Behind the sternocostoclavicular joint, passes the nerve vague etc. 6) Lymphatic system: thoracic duct, right lymphatic vein, etc; 7) thymus; 8) middle cervical aponeurosis. etc.

Its dysfunction (e. g. hypomotility associated with muscle, ligamentous, articular, vascular, lymphatic, nervous alteration etc.) can interfere with many important functions. In Manual Medicine it is common to find a static-dynamic asymmetry, a suffering at this level. This, despite clear, it is difficult to objectivise with instrumental tests. For this, we had to rely on our palpating sensitivity and on the pain, induced by the pressure, perceived by the patient (although aware of the margin of error related to the subjectivity of the method).

Aim. Verify frequency and laterality of its dysfunction and its relation with the "shoulder pain (S.P.)".

C. inclusion: cervicalgia, cervicobrachialgia, cephalalgia etc.

C. exclusion: genetic disorders, malformations, acute internistics, outcomes of interventions in the thorax, at cervical spine, at shoulders, laterocervical emptying etc.

Patients and study method. With the patient supine, the descending of the 1st rib was tested by gently pressing with the thumb on its lateral side. We evaluated 1) the resistance opposed by the rib; 2) the pain perceived by the patient during the maneuver (VAS scale). The side with the highest resistance and/or pain was reported. Only the "clear" cases were reported, given the margin of error. Among these, 127 (80 m, 47f) suffered from "shoulder pain" Excluded: previous fractures, luxations, etc. The sides of the "S.P." and of the 1st rib were compared. Sex and age were reported.

Results. 305 cases (196 f, 109 m) aged between 5 and 88 years. Average age: 42.6 (f 46.3, m 36.1). 1st rib in inspiration to the right: 65 cases (41f, 24 m); to the left 79 (60f, 19 m); 139 (82f, 57 m) were equal. 10 cases, with e. o. clearly + (5 right, 5 left) reported equal VAS; 2 had the 1st rib in bilateral inspiration; 5 only subjective (2 left, 3 right); 5 a subjective framework opposed to an objective framework.

-31 Cases of "S.P." left had: 20 the 1st rib in inspiration ipsilateral, 3 contralateral, and 8 equal. 70 cases of "S.P." right had: 44 the 1st rib ipsilateral; 9 contralateral and 17 equal. 8 "S.P" bilateral symmetric showed the 1st rib symmetric in 4 cases, to the left in 3 cases and to the right in 1 case. The 9 cases of bilateral + right "S.P." showed the 1st rib ipsilateral in 2 cases, symmetric in 2 and contralateral in 5. The 9 cases of "S.P." bilateral + left had the 1st rib ipsilateral in 4; equal in 3 and contralateral in 2.

Considerations and conclusions. The dysfunction is common in this important area. Given its relationships, it may act to cause complex dysfunctions, even distant. It should be noted the considerable ipsilateralty of the 1st rib in inspiration with the "S.P" The 1st rib must always be examined and possibly treated. From a personal experience, only by treating the 1st rib, there can often be an immediate improvement of neck, shoulder pains etc.

INTRODUCTION

The 1st rib is atypical; it holds close relations with important structures. Its dysfunction (e. g. hypomotility associated with muscle, ligamentous, articular, vascular, lymphatic and nervous disorder etc.) may interfere with many important functions. In Manual Medicine, it is common to find a static-dynamic asymmetry, a suffering at this level. Such, despite its clearness, it is difficult to be objectivized with instrumental tests. For this reason, we had to rely on our palpatory sensitivity and on the patient's pain perceived while lowering of the 1st rib (by the thumb's pressure). We are aware of the margin of error related to the subjectivity of the method.

PATIENTS AND STUDY METHOD

The work was conducted in 2012 using normal patients at the U.O. of R.R.F. of Feltre (BL) U.L.S.S. No. 2.

Inclusion criteria: neck pain, cervicobrachialgia, cephalalgia, "shoulder pain", etc.

Exclusion criteria: genetic disorders, malformations, acute in-

ternistics, outcomes of interventions in the thorax, cervical spine, shoulders, laterocervical emptying etc.

The patient had to stay supine, unclothed and relaxed. The cervical spine was in average flexion, ipsilaterally inclined (and slightly contralaterally rotated) to the rib to be tested. In this way, the descending of the 1st rib was tested by gently pressing with the thumb on its lateral side. For us, this is the most reliable and reproducible method, although many others are used in literature. We assessed: 1) the resistance opposed by the rib; 2) the pain perceived by the patient during the maneuver (expressed according to the VAS scale; we tried as much as possible to use a symmetrical pressure). The side with the highest resistance and/or pain was reported. Only the "clear" cases were reported, given the margin of error. Among these, 127 (80 m, 47f) suffered from "shoulder pain (S.P)" (tendonitis, rotators cuff lesions, impingement syndrome, joint restriction in flexion-abduction-external rotation, adhesive capsulitis, shoulder dislocations/subluxations, etc). Were excluded: previous fractures, luxations, shoulder surgery, etc. The sides of the "S.P." and of the 1st rib in inspiration were compared. Sex and age were reported.

RESULTS

305 cases were assessed (196 f, 109 m), aged between 5 and 88 years. The average age was 42.6 years (f 46.3, m 36.1). The 1st rib in inspiration to the right was found in 65 cases (41f, 24 m); to the left in 79 (60f, 19 m); and in139 cases it was equal (82f, 57 m). 10 cases, with objective assessment clearly + (5 right, 5 left) reported equal VAS; 2 had the 1st rib in bilateral inspiration; 5 only subjective (2 left, 3 right); 5 a subjective framework opposed to an objective framework.

— 127 cases (80 m; 47f) suffered from "shoulder pain": 31 cases on the left (23f; 8 m); 70 on the right (39f; 31 m); 8 (7f; 1 m) symmetric bilateral; 9 (5f; 4 m) bilateral harder to the right, and 9 (6f; 3 m) bilateral harder to the left.

— 31 cases of "S.P." left had: 20 the 1st rib ipsilateral in inspiration, 3 contralateral, and 8 equal. 70 cases of "S.P." right had: 44 the 1st rib ipsilateral; 9 contralateral and 17 equal. 8 "S.P" bilateral symmetric showed the 1st rib symmetric in 4 cases, to the left in 3 cases and to the right in 1 case. The 9 cases of bilateral + right "S.P." showed the 1st rib ipsilateral in 2 cases, symmetric in 2 and contralateral in 5. The 9 cases of "S.P." bilateral + left had the 1st rib ipsilateral in 4; equal in 3 and contralateral in 2 (tables I and II).

Table I.—*1st rib in inspiration*

Left	Right	=
79	65	139

Table II.—*1st rib in inspiration compared to "shoulder pain"*

	1st rib ipsilateral	1st rib controlateral	=
Left "shoulder p."	20	3	8
Right "shoulder p."	44	9	17
Total	64	12	25

ANATOMO- PHYSIOLOGICAL CONSIDERATIONS

The 1st rib is placed at the junction of the cervical, thoracic, and axillary regions. It is the largest and shortest of the ribs, it has a small radius of curvature. It is very oblique downward and forward; this causes the intercostal space to be tighter ahead than on the back. It restricts the upper orifice of the chest; it rests on the pleural dome. It is flattened from top to bottom. It has two faces: a superior and an inferior one; It has two edges: one internal and one external. It entirely inscribes in the curvature of the 2nd rib. The body is short and has no corner; it has 2 segments: the posterior oblique outer-front and the anterior oblique inner-front.

A) BODY

SUPERIOR FACE.

Posterior segment. It is divided into two parts by the upper ridge of the 1st rib: the inner part is carved in groove and provides insertion, in the 1/3 anterior, to the *scalenus medius* muscle; the outer part gives insertion in the middle part, to the *serratus posterior superior* muscle. Close to the costal tuberosity, it gives insertion to the *ileocostalis* muscle.

Anterior segment: at 2.5 cm from the chondro-costal joint, closer to the inner edge than to the outer edge it presents the tubercle of Lisfranc, onto which the *anterior scalenus* muscle fits in. On the front side as well as the back one of this tubercle, there are 2 grooves that converge outwards: the anterior for the passage of the subclavian vein and the posterior for the passage of the subclavian artery. Behind the posterior groove, near the outer edge, the first digitation of the *serratus anterior* muscle fits in.

Close to the anterior end, the *subclavian* muscle and the *costoclavicular ligament* are inserted.

INFERIOR FACE.

It is smooth and corresponds to the pleural dome. Along its outer edge, the *intercostal medium muscle* is inserted, while inside the latter is located the *internal intercostal muscle.*

Inner edge. Concave, rounded, bevelled, it gives insertion, near the neck, to the internal costopleural ligament; behind the tubercle of Lisfranc to the external costopleural ligament.

Outer edge. It gives insertion, along its entire length, to the *external intercostal muscle.* (this exceeds the upper face of the bone).

B) RIB'S POSTERIOR EXTREMITY.

It is flattened from top to bottom and shapes, with the body, almost a right angle. It has a head, a neck and a costal tuberosity.

1) Head. Generally, it has an inferior articular face that corresponds to D1, but often it has 2 facets when it articulates with C7 and D1. The head gives insertion to the costovertebral interosseous ligament; the anterior face gives insertion to the anterior costal-vertebral ligament; the posterior face gives insertion to the posterior costal-vertebral ligament.

2) Neck. It is flattened from top to bottom, and is oblique towards upside-backside-outside.

Superior face: it is divided in two by a longitudinal ridge: in the back, the first *levator costarum* is inserted; in the front, there is a groove for the passage of the 8th cervical nerve.

Inferior face. There is a groove for the passage of the anterior branch of the 1st dorsal nerve.

Anterior edge: it is thin. The posterior edge gives insertion to the cervico-transversarius-interosseous ligament.

3) Costal tuberosity: There is a posterior irregularity near the anterior face of the apex of the transverse apophysis of D1. The lower part articulates with the transverse apophysis of D1; the superior one gives insertion to the posterior costal-transversarius ligament; the inferior face gives insertion to the inferior costal-transversarius ligament.

C) ANTERIOR EXTREMITY. It is very thick and articulates with the 1st rib's cartilage.

The 1st rib's cartilage is attached to the sternum with a synchondrosis, by 2 conoid ligaments: an anterior and a posterior one.

The superior edge, on its inner side, has a triangular articular facet with the base of the sternum, which completes the articular sternocostal surface of the sterno-costal-clavicular joint.

ANATOMICAL CONNECTIONS

VESSELS: Subclavian vein and artery.

— The truncus arteriosus cervico-intercostal, which is the posterior branch of the subclavian, bifurcates at the neck of the rib

and supplies: 1) an ascending branch: deep cervical artery; 2) a descending one: superior intercostal artery.
The internal mammary artery descends vertically between the front-internal edge of the 1st rib and the pleural dome.
Behind the sterno-costo-clavicular articulation, the carotid artery passes through, together with other cardiac vessels.

NERVES.

— The anterior branch of C8 crosses the upper face of the neck and slides ahead of the medius scalenus.

— The anterior branch of T1crosses the inferior face of the neck and then moves to the anterior branch of C8 (including the neck in a nerve fork).

— The 1 st intercostal nerve, coming from T1, slides between the internal intercostal muscle and the pleura.

— The phrenic nerve descends to the anterior face of the anterior scalenus, passing between the subclavian artery and vein, thereafter penetrating into the chest.

— Behind the sternocostoclavicular joint, passes the nerve vague.

— Collaterals of the brachial plexus: 1) n. for the serratus anterior, n. for the pectoralis major, n. for the subscapularis.

— The stellate ganglion (fusion of the lower cervical ganglion with the 1st thoracic ganglion) is located in front of the neck of the 1st rib.

PLEURA: adheres to the 1st rib through the endothoracic fascia as well as internal and external costopleurical ligaments.

LYMPH S.: The thoracic duct, coming from the cistern of Pequet; the right lymphatic vein; the neck's basal and subclavears ganglia; thyme.

MIDDLE CERVICAL APONEUROSIS: This, at clavicular level, expands to the internal jugular and subclavear veins and then fixes to 1st rib and to the subclavian aponeurosis. The middle cervical aponeurosis, the endothoracic fascia and a fascia (coming from deep cervical aponeurosis), linked from the transverse apophisis of C7 to the front part of the inner edge of the 1st rib, shape the fascia of Sibson that contributes to the formation of what someone calls superior thoracic diaphragm.

1ST RIB DYSFUNCTIONS

By Di Giovanna E.L.[1]: The ribs' free motility is necessary, among other things, for the complete lungs expansion (which may be limited by a restriction of rib motility). Similarly, some lung diseases may alter rib motility.

The motility of the 1st rib is restricted and with low amplitude, due to the muscular-ligamentous tangle that fixes it back on the spine and front on the sternal manubrium. Such issue predisposes to dysfunctions.

These are common and can affect the overall status of the patient, given the importance of the nervous, muscle and fluidic structures with which it has close relationships.

Dysfunction causes: spinal and thoracic traumas, etc.; dysfunction of D1 (or D2) or C7, postural stress, obstetrical trauma etc.

By [2] Symptoms may be far off, with no apparent relationship with the dysfunction (many vascular-nervous relationships, especially with the stellate ganglion).

— Possible consequences by [3], [4].

— Asthma and anguish feeling, chest tightness (even through the costopleural ligaments).

— Pseudo angina, hypertension, (even through the costopericardial and vertebropericardial ligaments), cardiac arhythmias.

— Arteries (via the sympathetic nerves of the stellate ganglion): subclavian: arm paresthesias, numbness, thyroid congestion.

— Carotid: headache, vertigo, tinnitus.

— Arm lymphatic stasis.

— ENT disorders (pseudo-rhinitis or sinusitis, laryngitis, tinnitus).

— Congestion of mammary glands.

— Cervical stiffnes (especially trapezium); cervicobrachialgia, shoulder pain.

— Phrenic: diaphragmatic spasm.

— Stellate ganglion: facilitation of information at the underlying visceral level.

Intercostoscalenic outlet: given by the anterior and middle scalenus and by the 1st rib. It contains the subclavian artery and the primary nerve trunks. During the movement of extension, forced inspiration and ipsilateral rotation, the subclavian artery is compressed by the narrowing of the outlet. During the movements of abduction of the arm and of shoulder retraction, the inferior primary nerve trunk is stretched against the middle scalenus.

Costoclavicular outlet: made by the lower surface of the medial part of the clavicle and by the upper surface of the 1st rib. The sternoclavicular-1st rib joint dysfunctions, such as a spasm-retraction of the subclavian muscle, may narrow it down. When lowering the shoulder, the closure of the subclavian space leads to a compression of the subclavian vein. The same occurs during the abduction since the vein is flattened against the subclavian muscle.

Clinical examination and disfunctions

We necessarily have to mention a few authors, both for the manual examination and for possible dysfunctions. Certain opinions may appear personal-based; some schematizations, educationally useful, are not easily found in clinical practice.

— By [1]: Assessment of the 1st rib: it is usually palpated in 3 areas: 1) the posterior-superior surface through the trapezius, 2) the antero-superior surface in the depression behind the clavicle, and 3) the anterior joint just below the clavicle, at the sternal edge.

Patient supine: 1) with the thumbs in the anterior part of the supraclavicular depression, we can assess the static position of the 1st ribs (is one higher?); 2) we can examine the tissue and muscle's tone to look for any abnormalities; 3) thumbs can be placed on to the superior-posterior surface and slightly pushing the ribs down, to report the resistance. If there is resistance, the rib is dysfunctional. 4) with the thumbs in the anterior-superior surface, in the depression behind the clavicle, the patient is asked to take a deep breath and then to exhale completely (if one rib stops its movement before the other during inspiration, there is probably a rib limitation towards inspiration; if a rib stops its movement before the other during exhalation, there is a rib limitation towards expiration). 5) It is also possible to test the group of upper ribs by placing hands (positioned flat and symmetric) onto them while the patient breathes.

Palpating examination by [2]: it is possible to conduct it at the base of the neck, at the front of the anterior edge of the trapezius, in the frontal plane of the C7 spinous process; the patient can be made breathing. A 1st rib in inspiration (expiratory limitation) shows a high posterior rib tuberosity as well as a prominent rib angle. In exhalation, these two parameters are hidden; vice versa occurs for an expiratory dysfunction.

— By Mossi E.[5] the buckle pump motion is carried out around an axis that passes through neck, along the long axis, that goes from the costal-somatic to the costal-trasversarius joint. If the anterior part to the axis lowers, the rear rises and vice versa The movement and the posterior lowering in particular, are not palpable as the area anterior to the transverse process is not easily palpable. As the rear costal angle is in front of the axis, it rises in inspiration. Since the lever arm of the front part moves much more than the rear one, it is almost the only real movement. The transverse processes of the upper dorsal vertebrae [6] (and therefore the axises) are located in a relatively frontal plane, thus in inspiration, the rib increases the

anteroposterior chest diameter. The more it goes down, the more the transverses (and the axises) are sagittally oriented; therefore, the inspiration increases the thoracic transverse axis above all.

— By [5], due to its position, it is affected both by upper (skull and cervical spine) and lower influences (lumbar spine, pelvis). Its ligamentous system is radial type (the radial ligament sends fibers also to the body of C7). The orientation of the costal-transversal articulation differs from that of the beneath ones: it is more vertical and oblique upward: it therefore favours the vertical sliding of the costal tubercle onto the transverse apophysis (the obliquity favours a certain degree of slipping). It has a preferred vertical sliding, while in the ribs beneath, that have reversed obliquity, the inferior costal tubercle has an impediment to the upward slipping. It does not have a posterior rib angle (like all the other ribs); there is a right angle between the rear and lateral part; unlike other ribs, it does not have the typical "torsion bar" curve. The 1st rib's cartilage is short and thin, rigid and often ossified to the sternum, with little chance of compensation. The movement is upward and downward limited, joint to that of the manubrium (it rises during inspiration and lowers in expiration). The rib's cartilage allows compensations at all levels (respiratory, postural etc.). At the 1st rib's level, this does not happen and so these will be reflected at the costal-trasversal joint (which favours the upward sliding of the 1st rib). The 1st rib is in front report with the inner end of the clavicle (sterno-costal-clavicular joint with costal-clavicular legament and subclaviusmuscle). Even through the action of the anterior scalenus (which raises the front part, as an buckle pump action type) as well as the middle one (which elevates the lateral part, with a bucket handle action type), the relative front fixity causes the slipping up of the posterior tubercle (for accommodation), which "sits" onto the upper end of the transverse (the tubercle goes up and slightly backward). The 1st rib's dysfunction in elevation, in the rear part, is found in the costal-trasversary joint, with a vertical displacement of rib facets in relation to the vertebral one. That is, the 1st rib appears with the rear part relatively higher than the front one (as if it were an expiratory dysfunction), although the dynamic limitation is lowering. Palpating, the anterior part of the rib is depressed, while the posterior tubercle gives the impression of a salience.

— By Richard F[3]: dysfunctions: 1) in inhalation or extension 2) in exhalation or flexion. It is often associated with the dysfunction of D1 (or D2) or C7. The rib dysfunction may be primary or secondary to the dysfunction of T1.

The flexion-extension dysfunctions of the 1st rib are often secondary to the dysfunctions of T1; they can be: 2) primary; 3) intraosseous; 4) they can have a breathing origin.

1) Secondary to primary T1 lesions (ERS): on the side of a posterior positional T1 lesion, the 1st rib is in extension: the posterior part is low and rear, while the anterior one is high and rear. On the opposite side of the posterior apophisis, the 1st rib is in flexion: the posterior part is high and frontal; the anterior one is low and frontal.

Differential diagnosis: During the flexion of the neck, the 1st rib is in flexion, while during the extension it is in extension too. If the dysfunction in inspiration of the 1st rib is secondary to the dysfunction of T1 (so the rib is extended), during cervical flexion it does not go forward, while in extension the dysfunction is camouflaged.

2) Primary: by traumas, sudden movements etc. (cervical dysfunctions which can alter the scaleni muscles may develop therm). A) posterior (more common for the spasm-hypertonia of the anterior and middle scaleni). B) anterior (for scaleni hypotonia; much rarer). The flexion-extension of the neck does not change the parameters. If there is a posterior subluxation (extension) of the 1st rib, the T1 is rotated to the same side and inclined to the opposite side (the transverse process of ipsilateral T1 is posterior and superior). If there is anterior subluxation (flexion) of the 1st rib, T1 is rotated to the opposite side and ipsilaterally inclined (the ipsilateral transverse process of T1 is anterior and inferior).

3) Intraosseous: intrinsic twist that predisposes to dysfunctions (scoliosis).

4) Respiratory (for action of the scaleni). Diagnosis. In inspiration, while sitting, it should get up and get down in the exhalation.

— By Maitland G.D. [7] The examination and the correction techniques of the 1st rib differ from those of other ribs, as a greater costal area is palpable. The corrective force may be applied with thumbs (patient prone) 1) posteriorly through the trapezius (postero-anterior pressure and towards the feet); 2) frontally to the trapezius (postero-anterior pressure and a little more inclined towards the feet); 3) (patient supine) with an antero-posterior oscillating movement and downward in all palpable parts of the 1st rib.

CONSIDERATIONS AND CONCLUSIONS

Shouder pain

We have no precise explanation about the percentile-important relationship between shoulder suffering and 1st rib in inspiration, but given the relations (especially nerves, but also vascular, lymphatic, osteo-muscle-ligamentous etc.), this pathological interdependence is amply justified. For Maigne R. [8]"the shoulder is nothing, the neck is everything. "

— By [3]: if the 1st rib is in anterior rotation, the collarbone adapts itself through the costal-clavicular ligament. This compromises the scapulohumeral biomechanics, especially with limitation of external rotation, protraction and abduction of the shoulder.

— By Di Giovanna E.L.[1] In Manual Medicine it is important to assess static and dynamic asymmetries, hypomotilities (very frequent) of the ribs as well as of the structures intimately connected to them (cervical-dorsal-lumbar spine, sternum, clavicle, thoracic and abdominal organs, etc.). Unfortunately, it is very complicated to get instrumentally objective bases of the examination and the assessment of parameters is mainly clinical. We are aware of the margin of error related to the subjectivity of the method, but for a long time medicine has had to rely on skillful palpation of the surgeon, on the keen auditory perception with the stethoscope etc. It should be noted the frequency of dysfunctions in this important area for the organism. Given its relationships, it may act to cause complex disorders, even far off. This assessment should not be underestimated and should be part of the cultural-experiential heritage of many doctors, even non-manual, although we believe it is a particular field of expertise of Manual Medicine as it needs special preparation and loads of experience.

— The considerable ipsilaterality of the 1st rib in inhalation with shoulder pain should be noted. The 1st rib must always be examined and treated, if necessary. From a personal experience, only by treating the 1st rib, it is often possible to improve immediately a neck pain, a shoulder pain etc.

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Virtual reality as a cognitive rehabilitation for attention deficits in post-ischemic stroke

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The current knowledge about neuropsychological mechanisms of cognitive deficits resulting after brain injury allow to implement specific cognitive rehabilitation trainings for the recovery of impaired functions. The patients post-stroke, in addition to motor deficits, often show selective alterations of cognitive processes [1]: the involvement of attentional control seems to be primary while the involvement of other features, including a reduction in personal daily autonomy, results secondary.

Virtual reality (VR), given its great potential, represent a growing new technology used in the field of rehabilitation [2]. Recently, a large number of studies based indicate the VR as a powerful instrument for the treatment of functional outcomes such as balance deficit in clinical setting [3, 4]. On the other hand there are just few studies to prove the effectiveness of VR treatments for cognitive impairment [5]. The data shown by Bo Ryun et colleagues [6] about the influence of VR on the attention deficits are particularly interesting.

The aims of our study were: 1) to evaluate the effectiveness of virtual reality for the recovery of attentional deficits in a heterogeneous sample of patients post-stroke; 2) to validate the use of virtual reality through BTS Nirvana as a tool for the cognitive rehabilitation.

MATERIALS AND METHODS

Once evaluated the initial neuropsychological assessments a total of 10 post ischemic stroke patients were selected (mean age=69 years, SD=8.09; education mean=8 years, SD=3.90) for the Neurological Rehabilitation, complying with specific inclusion criteria: adequate supervision and collaboration, control of the trunk (Trunk Control Test=50-100), mild to moderate cognitive impairment (MMSE>18), selective deficits in attentional processing (the scores were obtained in neuropsychological tests Attentional Matrices, Trail Making A and B).

Virtual reality training was performed by three clinical neuropsychologists using the BTS Nirvana® system (*BTS Biomedical, IT*), a tool originally designed for motor rehabilitation, as an innovative solution to allow a complete visual and auditory immersion in a virtual environment. The BTS Nirvana® consisted of one large screen (200x150 cm), one video camera, data gloves and virtual objects (Fig. 1).

All 10 patients followed a cognitive rehabilitation program through BTS Nirvana® for a total of 21 sessions using an unconventional therapeutic approach able to provide the patient cognitive and motor stimuli involving also the motivational profile. The exercises present in the BTS Nirvana®, originally designed for motor rehabilitation, were selected, adapted and administered following the appropriate time and procedures in accordance with the methodological and scientific models of cognitive neuropsychology.

Figure 1.—Virtual reality experimental environment of BTS Nirvana® system.

To all patients were administered, during three weekly sessions, 2 preliminary tests ("Pink Roses" and "Shell Arch" in 60 seconds) and 3 experimental trials ("The Mole 1", "Music Arch" in 60 seconds; "The Mole 2" in 120 seconds). Every week the number of stimuli for each of the five trials were linearly increased.

At the end of the cognitive rehabilitation training, all patients underwent follow-up neuropsychological assessments.

RESULTS

The statistical analysis of the data (t-test) obtained by diagnostic and follow-up neuropsychological assessments, showed a quantitative decrease in the tests response times for selective and divided attention (means Trail Making A: after=151.78 seconds and SD= ±86.63; before=114.70 seconds and SD=±73.29. Means Trail Making B: after=279.33 seconds and SD=±130.61; before=215.89 seconds and SD=±68.29) and highlighted significant differences (t-test (8)=-2.82, p<.001) between scores obtained before and after the cognitive rehabilitation training for the Attentional Matrices (means after=29.46/60stimuli and SD=±8.02; means before=39.30/60 stimuli and SD=±7.32) (Figure 2).

DISCUSSIONS

During daily activities attentional processes are considered of primary importance to perform all those tasks that require the use

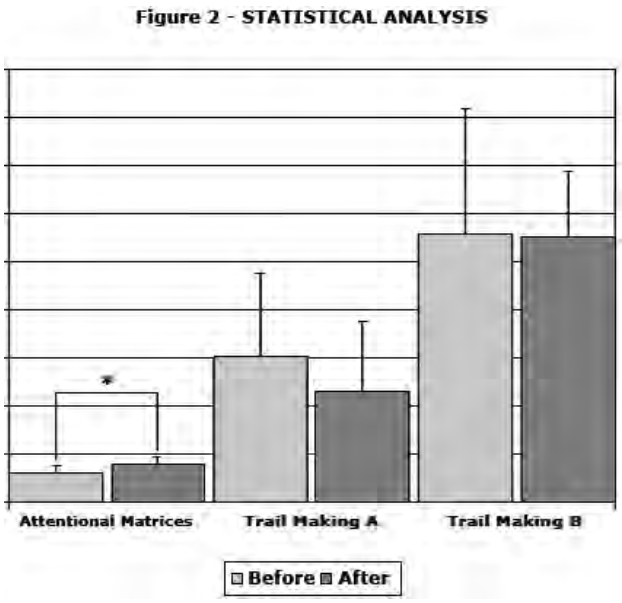

Figure 2.—Statistical analysis (t-test) of neuropsychological assessments before and after cognitive rehabilitation with BTS Nirvana® system.

of other cognitive processes. In other words, the intact attention is required to use higher level cognitive functions (executive functions, memory, solve problems, visual and spatial skills) and when attention and concentrate abilities are impaired, also memory, problem solving and production of appropriate actions could be difficult [7].

Neuropsychological disorders are commonly reported after ischemic strokes and the attentive difficulties are mainly described in acute hospitalized patients as distractibility, reduced selective auditory-visual attention and significant increase in reaction time. In our study, we could not conduct a comparative study on the effectiveness of VR treatment depending on lesion locations of cerebral hemisphere, cerebral cortical or subcortical areas due to the small number of patients. However, through the standardization of protocols for cognitive rehabilitation using VR generated by the BTS Nirvana®, we showed that the administration of hierarchical multi-sensory exercises (motor, visual, auditory, motivational) to all patients contributed to: 1) a reduction of response times during the skills; 2) a significant improvement during the selective and sustained attention tests as a result of a change in spatial orientation, in perception and space exploration peri/extra-personal and finally in the ability to select relevant stimuli omitting distractors.

CONCLUSIONS

In our study, we found that post ischemic stroke patients with attention deficits when treated with the BTS Nirvana® VR cognitive rehabilitation training showed significant improvement on selective and sustained attention.

In the future, further efforts will be needed to develop VR protocols using BTS Nirvana® and to demonstrate their effectiveness for improvement in an homogeneous sample of post-stroke patients and in various cognitive areas.

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Influence of hallux valgus management on Quality of Life

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Hallux valgus (Figure 1) is common with a standardised prevalence of 28.4% in adults older than 40 years. (1) It can be a debilitating disease which influences the quality of life (QoL).

In particular hallux valgus severity is significantly associated with reduced physical function, bodily pain, general health, social function, and mental health. There is a progressive reduction in both general and foot-specific health-related quality of life (HR-QOL) with increasing severity of hallux valgus deformity. (2)

Concurrent hallux valgus and big toe pain but not isolated hallux valgus associates with impaired overall satisfaction with health and low score on the physical, psychological and social domains of World Health Organization Quality of Life-BREF (WHOQOL-BREF). (1)

Patients expectations for hallux valgus surgery consist of improved walking, followed by reduced pain over the bunion and wearing daily shoes; these expectations vary according to age and gender but not occupation. (3)

Possibilities of treatment for hallux valgus are different, from splinting and physical therapies to open classic surgical interventions with many techniques.

Surgery produces a significant improvement in the quality of life. The severity of the deformity does not influence the QoL, however; the free choice of shoeware and the degree of satisfaction with the surgery has a positive effect on the QoL outcome. (4)

Usually post-operative pain is relevant. A more appropriate hallux valgus management should consider the following topics: minimization of surgical invasiveness, prevention of complications, optimization of functional recovery, QoL improvement, optimization of pharmacological treatment.

Distal transverse first metatarsal osteotomy has revealed to be efficacious in hallux valgus correction (5) and a good compromise between effectiveness and low invasiveness can be reached through the percutaneous approach. (6) Binding the advantages of the sharp transverse cut of the Bosh technique (5) and the percutaneous approach of the Percutaneous Distal Osteotomy (PDO) technique (6) we found out our favorite surgical treatment for hallux valgus.

Aim of this paper is to evaluate effectiveness and safety of our protocol for hallux valgus surgery.

MATERIALS AN METHODS

We consecutively enrolled 24 patients with 30 cases of symptomatic hallux valgus operated on by the same surgeon (M.L.) from 1-9-2011 to 30-6-2012.

Inclusion criteria were: age ≥ 18 years, symptomatic (pain NRS ≥ 3/10) hallux valgus, Inter-Metatarsal Angle (IMA) ≥ 12° and ≤18°.

Exclusion criteria consisted of: other major diseases or painful foci, other associated corrections of deformities of the foot, advanced 1st metatarso-phalangealal arthritis/arthrosis (Kellegren-Lawrence stade IV), Inter-Phalangeal Valgus of the big toe > 20°, previous surgical interventions on the same hallux, specific contraindications to the protocol.

Our management protocol (*Standard Operative Procedure*) consisted in: Day Surgery treatment of a single hallux, local (digital troncular) anesthesia with mepivacaine 2% / 5 ml + ropivacaine 7,5% / 5 ml (Figure 2), percutaneous distal metaphysis first metatarsal transverse osteotomy fixed in hypercorrection with a percutaneous longitudinal 2,5 mm Kirschner wire under amplifluoroscopic control (Figures 3, 4, 5), postoperative pain management with oxicodon/naloxone 10/5 mg bid per os starting 6 hours after anesthesia for 3 days, infection prophylaxis with a single pre-op-

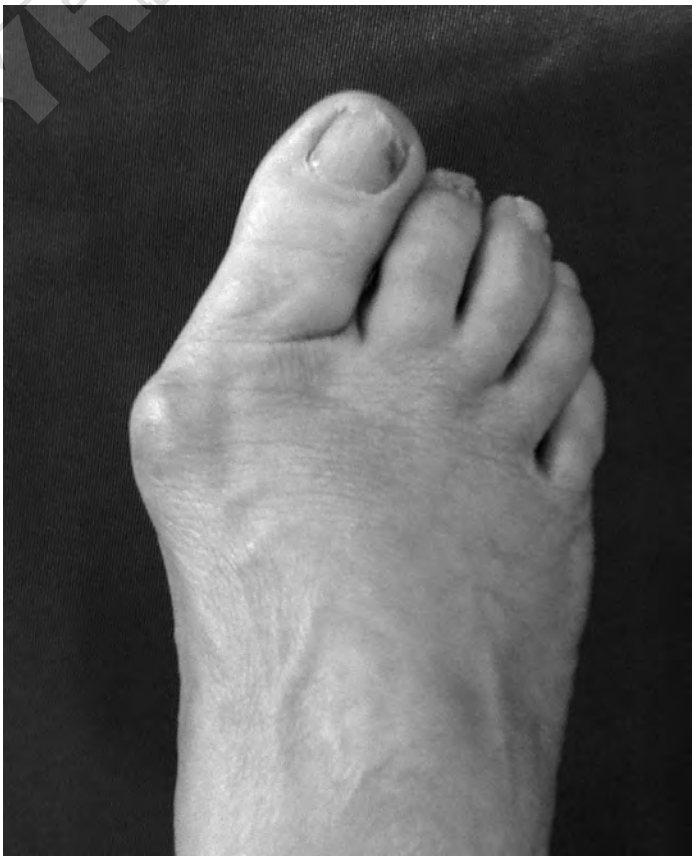

Figure 1.—Hallux Valgus: clinical aspect.

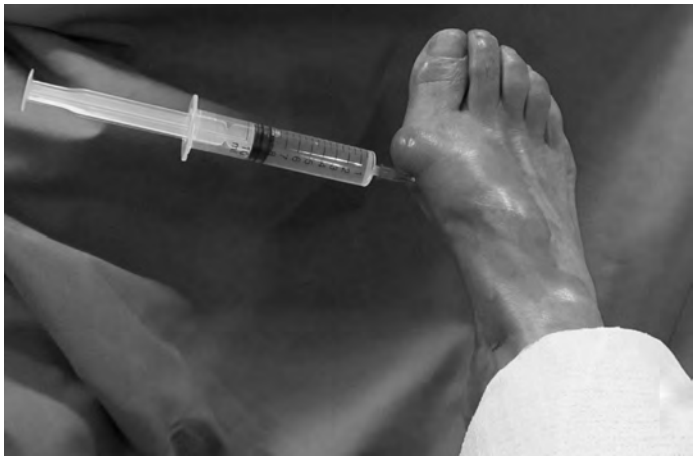

Figure 2.—Local anesthesia.

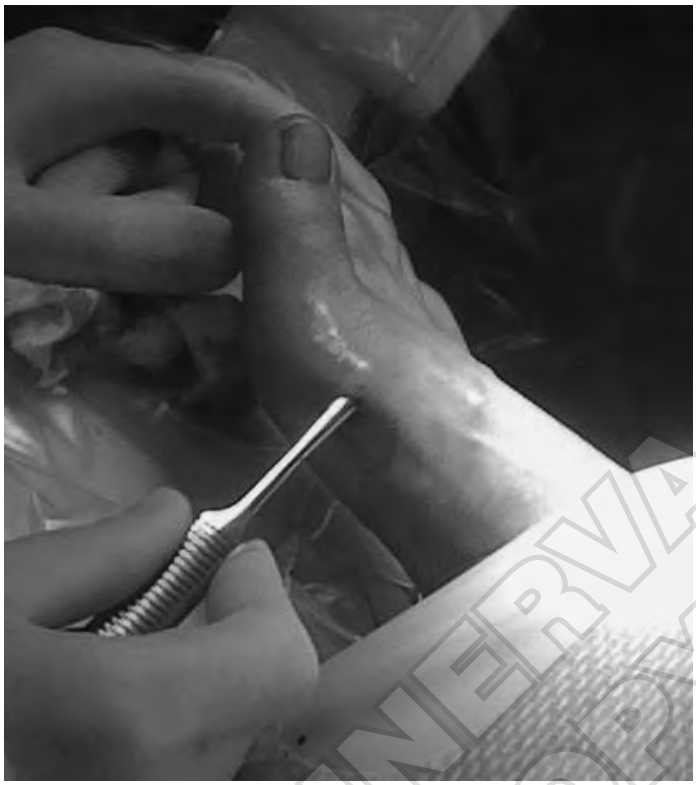

Figure 3.—Percutaneous correction.

erative dose of Amoxicillin 2,2g i. v., thrombo-prophylaxis with a daily s. c. prophylactic dose of L.M.W.Heparin for 12 days from surgery, immediate post-operative rehabilitative management with full weight bearing walking with a talus shoe for the first 30 days, active assisted Kynesi-therapy of the big toe after K. wire removal at 30 days post-operative.

The *outcomes* we considered with relative measurement tools were: valgus angle and inter-metatarsal angle on weight bearing X-ray for efficacy in valgus correction, VAS Foot and Ankle Outcome Score (from 0 to 100 x 20 items = max 2000 points) for QoL[7], Numerical Rating Scale (NRS) for pain, clinical reports for adverse effects and/or complications.

RESULTS

Valgism correction with disappearance of prominent symptomatic bounionne was obtained in all patients (Figures 6 and 7) with a mean valgism angle passing from 35° (SD=14°) to 8° (SD=3°). (Figures 8-11)

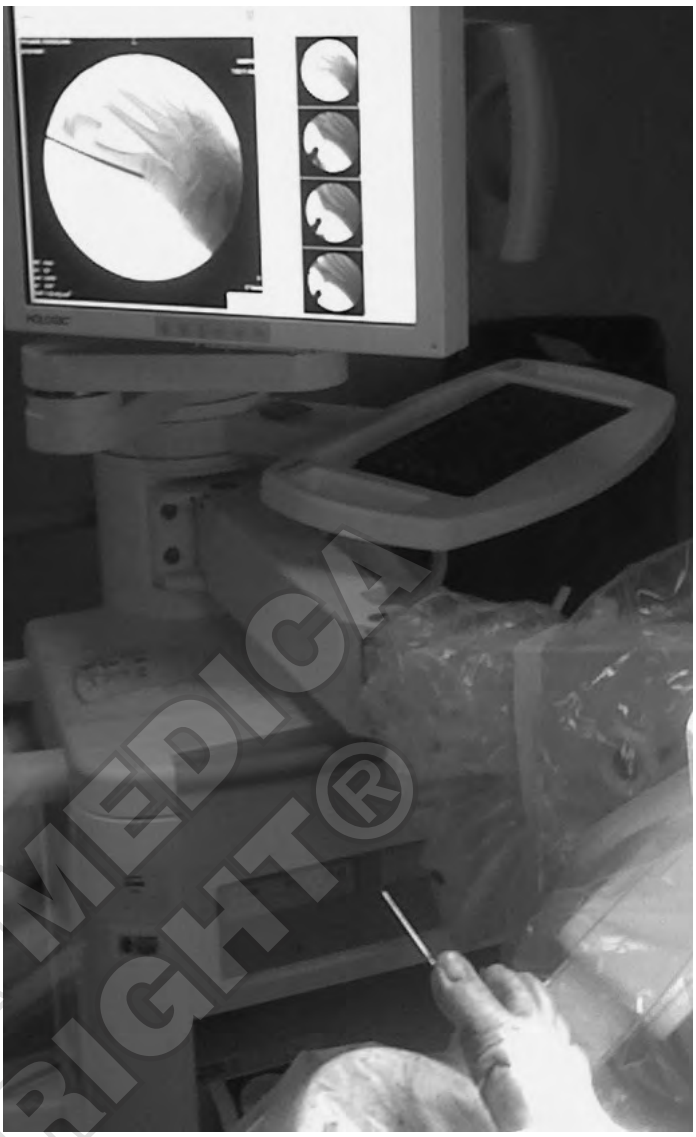

Figure 4.—Intra-operatory fluoroscopic control.

Pain control was generally good but in two cases in which pain was NRS > 5/10 and thus analgesics were given for a prolonged period. (Figure 12) Only two patients complained of nausea and were therefore switched to a different analgesic.

We needed additional antibiotic in one case of persistent local swelling and redness.

No other undesired effects were experienced.

VAS Foot & Ankle Outcome Score passed from a mean value of 1240 +/- 180 preoperatively to 1850 +/- 210 at 3 months post-op. follow up. (Figure 13)

All the patients were satisfied by the treatment and would have it performed in the same way.

DISCUSSION

Despite the esthetic result is mostly based on the clinical aspect, to measure the efficacy in valgus correction we considered the valgus angle and the intermetatarsal angle taken on weight bearing X-rays before and after surgical treatment believing these parameters to be more objectives and reproducible.

In the beginning of our experience we used a Kirschner wire of 2 mm as originally described by Bosh [5,6] but after a few cases of skin lesions for the cutting effect of the narrow wire we passed to a greater caliber of 2,5 mm.

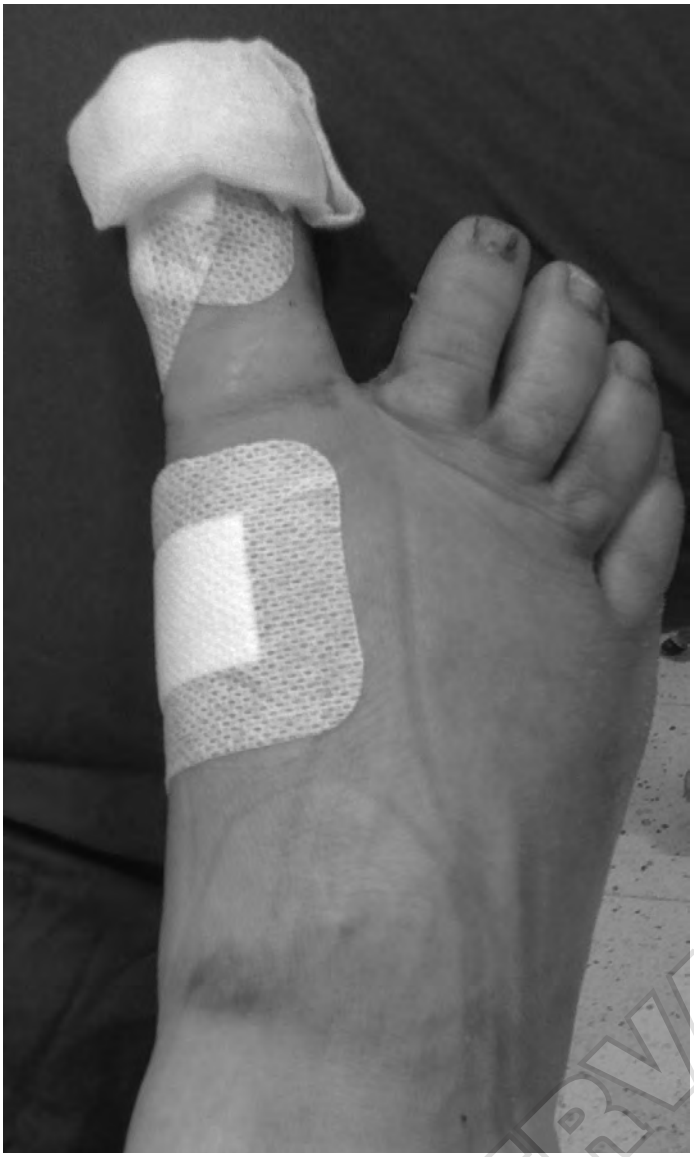

Figure 5.—Post-op. dressing in hypercorrection.

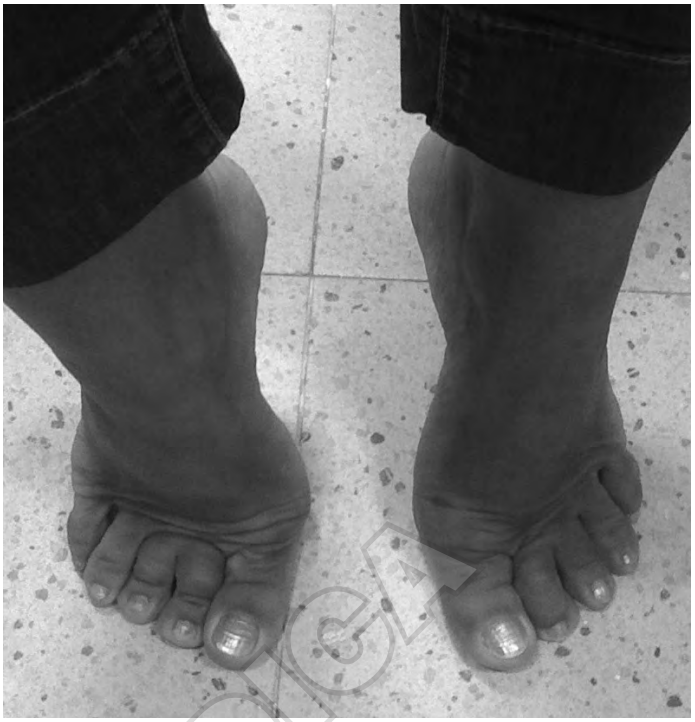

Figure 7.—3 months follow up: hill rising.

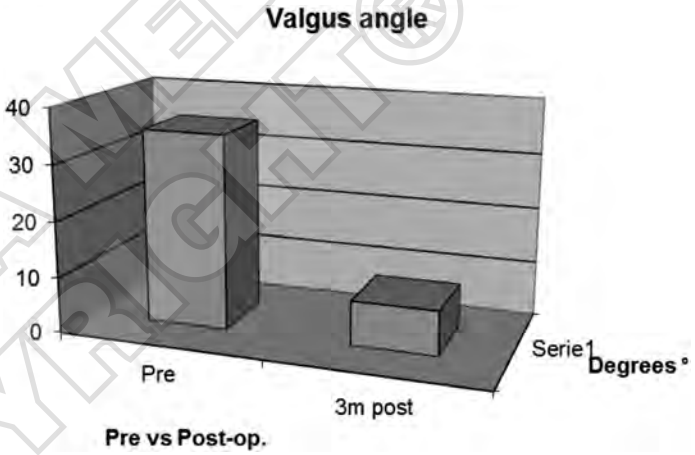

Figure 8.—Valgus angle pre and post-op.

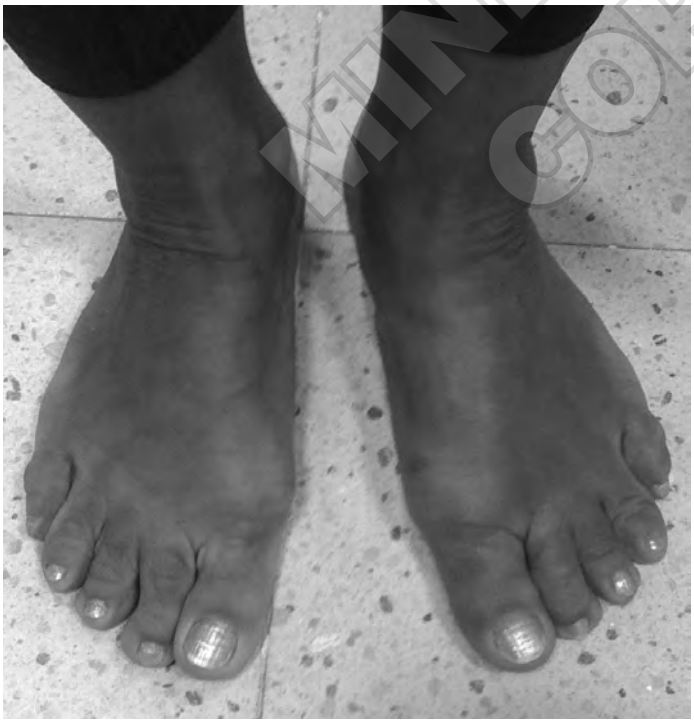

Figure 6.—3 months follow up: orthostasis.

Pain is one of the most relevant aspects of the quality of life and mostly in the post-operative period when strong, effective and well tolerated drugs are needed. For this reason the association of oxycodon and naloxone can be considered instead of usual Non Steroid Anti-Inflammatory Drugs. To increase the analgesic effect from the beginning of treatment perhaps we should start the drugs assumptions sooner after surgery or even before the local anesthesia.

For thrombo-prophylaxis no absolute guideline exists for foot surgery at the moment. We believe that the best prophylaxis consists in reduced invasiveness with a percutaneous approach in a short surgical time and in an early full weight bearing walking, but anyway we routinely used a single prophylactic dose of Low Molecular Weight Heparin (LMWH) for 12 postoperative days even for a legal reason. Of course it is very important to consider the stratification of the thromboembolic risk [8] giving higher and prolonged doses of LMWH in selected cases.

For infection prevention we assured a single preoperative dose of wide range antibiotic and were particularly careful in medications. As known diabetic patients are to be considered at higher risk of infection.

The need to have a quantitative comparison of the quality of life and specifically referred to the foot before and after the treatment

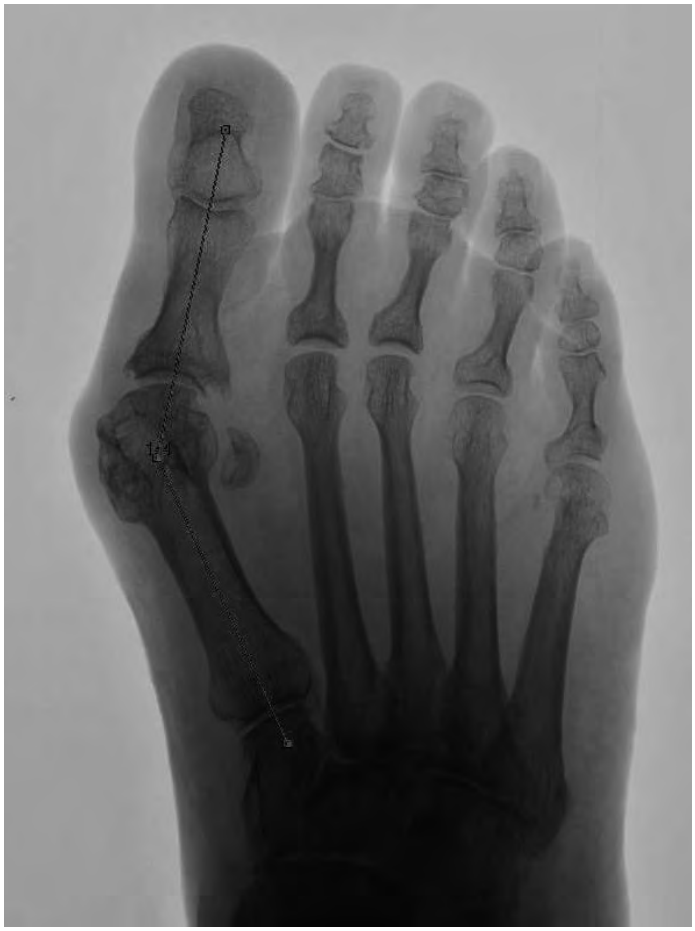

Figure 9.—Hallux valgus X-ray.

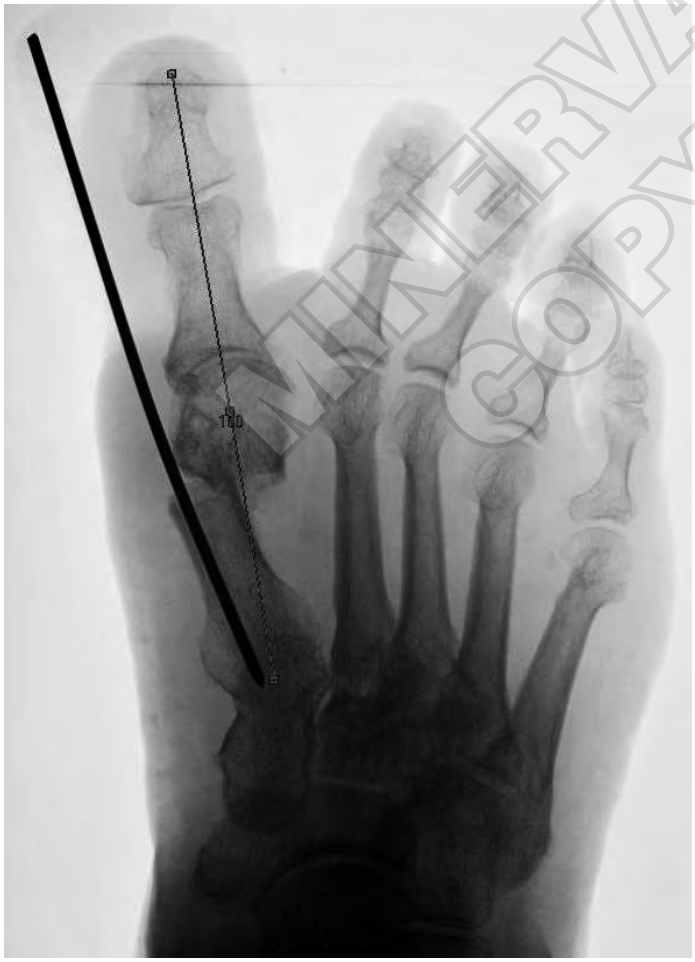

Figure 10.—Post-op. X-ray.

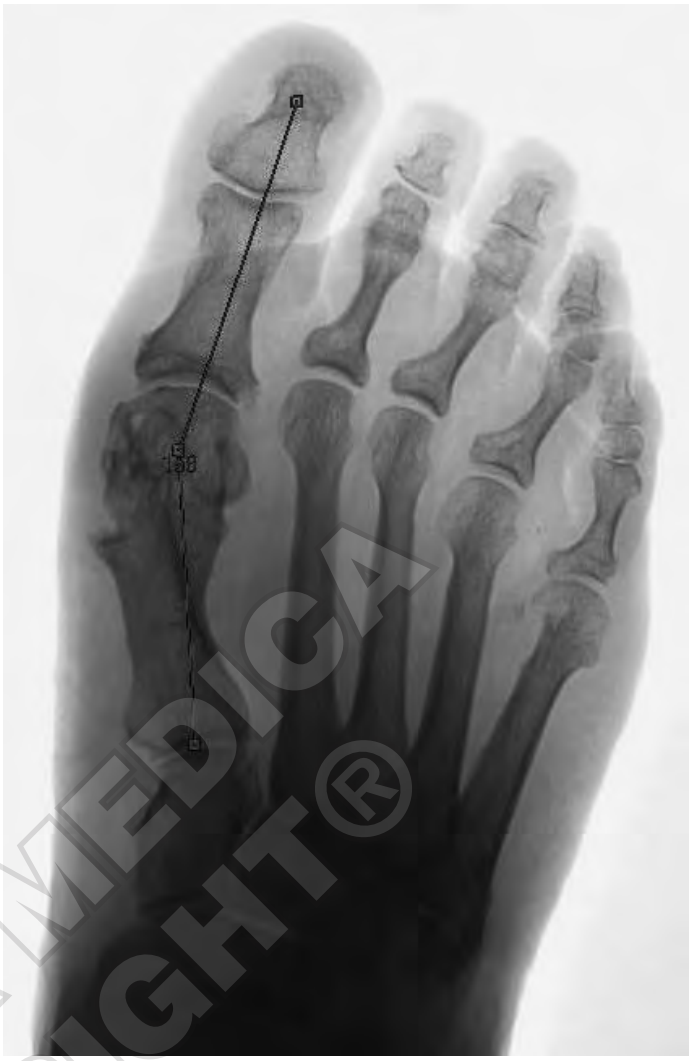

Figure 11.—One year follow up X-ray.

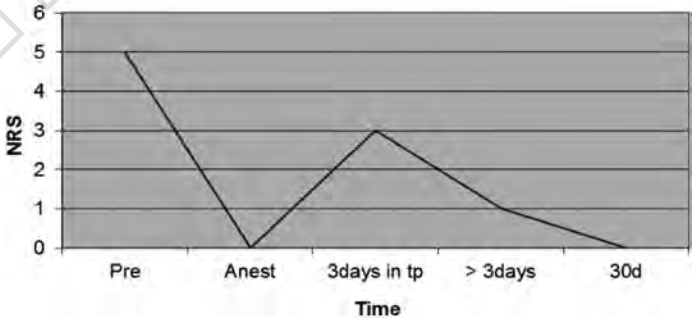

Figure 12.—Pain (NRS/time).

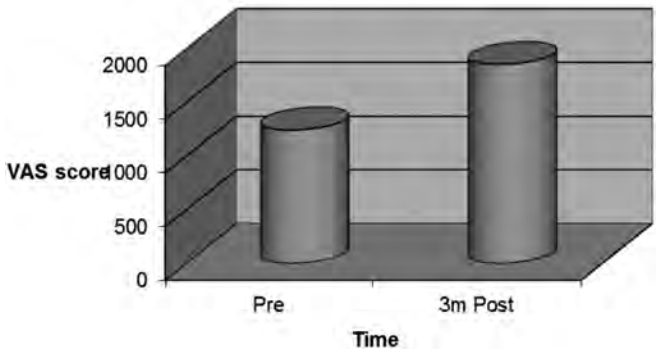

Figure 13.—VAS Foot & Ankle Outcome Score pre and post-op.

led us to use the foot and ankle VAS questionnaire recently published by Richter *et al.* [7].

CONCLUSIONS

On the bases of these sample cases we can say that the right choice of the protocol of treatment in hallux valgus is important for quality of life improvement.

According to our on-going experience in hallux valgus surgery, this protocol can be cosidered effective and safe for the patients: the mini-invasive approach, effective pain treatment with appropriate and better tolerated drugs combination and early rehabilitation decreases side effects and complications and improves QoL.

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Evaluation of problems and needs of severe brain injured patients' families: a study carried out in the north of Italy

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In our study head injury is the most frequent cause of severe brain injury and it often affects young men who need many admissions to hospital, extended and special treatments. The main cause is due to road accident (75.8%), then 7.6% is represented by work accident; 1.5% is due to domestic accident and 4.5% is represented by sport accident and least 10.6% is due to other causes. Most of this patients need to find help in their family in order to continue rehabilitation and reintegration in daily life. "Associazione Genesis" and "La rete associazioni riunite per il trauma cranico" (United Associations for head injury handicap recovery) carried out research a study in the North of Italy in order to evaluate problems and needs of brain injured patients' families, their quality of life changed and how institutions intervened to help them.

MATERIALS AND METHODS

Thanks to "Associazione Genesis" and "La rete associazioni riunite per il trauma cranico" (United Associations for head injury handicap recovery) we contacted severly brain injured patients' families and we sent them a Family Questionnaire to collect patients data (gender, education, how injury occurred, level of injury, situation after discharge..) and family data (needs, supports, expenses, discomforts…).

RESULTS

We sent 200 questionnaires and we collected 144. The majority of the participants showed that families are the most important care giver even if their interpersonal relationships become worse and worse.

DISCUSSION

We analyzed all the questionnaires we collected and we demonstrate the families are the most important care giver (95.8%) and only 4.2% go to hospices or continue to live alone (Fig. 1). Care givers age is in the range from 66 to 80 years old: parents provide for children with severe brain injured. The participants considered land services inadequate (36.3%) or enough adequate (38%) and only 25,7% full adequate (Fig. 2) even if 62% of patients need 1 or more admissions to hospital also in relation to GOS (Glasgow Outcome Scale): the worst scores need many hospitalizations. Many of these patients need also special aid supports (such as wheelchairs…) but 65,5% had to buy them by themselves. Families feel discharge as an hard moment: uncertainty of relatives' future health condition, high costs for their rehabilitation and medical examinations and sensations of weakness make families worried, anxious, tired and angry. Their quality of life change: they have to sell properties or ask for a loan; their interpersonal relationships become very rare or rare (60.9%) (Fig. 3)

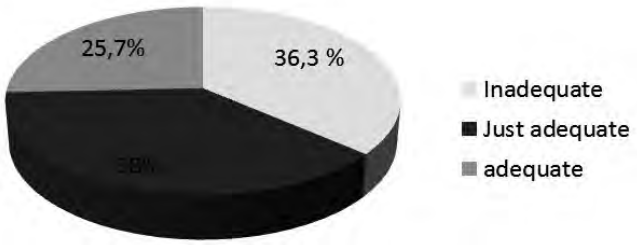

Figure 2.—Public Service.

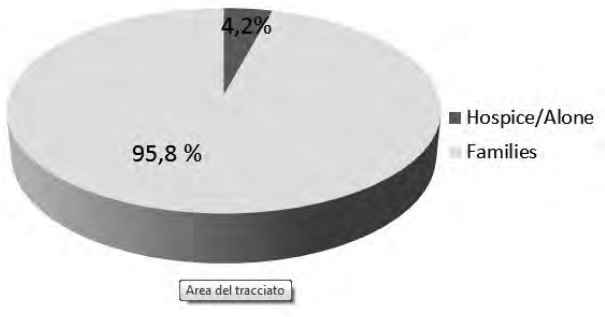

Figure 1.—Caregiver.

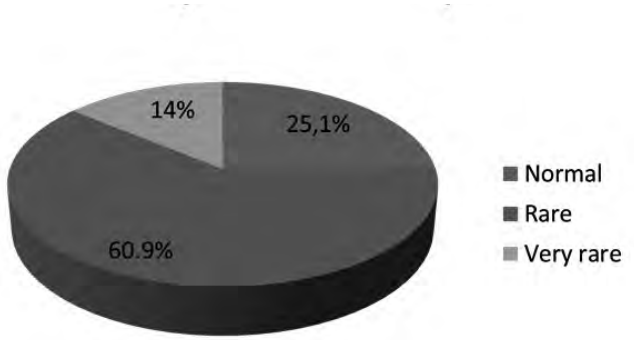

Figure 3.—Interpersonal Relationships.

CONCLUSIONS

Analyzing collected data we can assert that despite many difficulties Italian families hold out, even if their social and quality of life change drastically. The majority of the participants never thought about their injured relative's death as a problem solution but they ask above all medical information, social and emotional support. We demonstrate that establishments can spend much efforts to help these families such as volunteers associations do.

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Il ruolo della CIMT nella riabilitazione delle cerebro lesioni acquisite

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Le cerebro lesioni acquisite (GCA) rappresentano la principale causa di disabilità nei paesi occidentali e l'emiparesi è il deficit che maggiormente si manifesta. Dopo l'evento acuto esiste una riorganizzazione corticale per effetto di attività intensa ("use-dependant plasticity"), ma dell'80% dei pazienti sopravvissuti, una percentuale variabile tra il 30% ed il 60% non riacquista l'uso dell'arto superiore colpito. Tra le motivazioni addotte si ritiene il fenomeno del "*Learned non Use"* come elemento pregiudicante il recupero post-ictale, lì dove il danno risparmi una quota di movimento. Accade che ripetuti insuccessi nel tentativo di utilizzare l'arto colpito conducano il paziente a sopprimerne l'utilizzo. Vi è pertanto la necessità di guidare la riorganizzazione mediante uso pianificato dell'arto in attività finalistiche ("plasticity driving"). Tra i diversi protocolli studiati la Constraint-induced movement therapy (CIMT) ha guadagnato una popolarità considerevole come tecnica di trattamento per la riabilitazione dell'arto superiore affetto da paresi e si basa sull'immobilizzazione dell'arto non paretico mediante splint con l'obiettivo di incrementare la performance dell'arto lesionato mediante un concomitante training intensivo di tipo task-oriented. A differenza della maggior parte delle tecniche classiche di neuro riabilitazione largamente impiegate nella pratica clinica, la CIMT può essere considerata la più ampiamente studiata ed il nostro scopo è quello di verificarne l'efficacia e la riproducibilità all'interno della clinica "Quarenghi" di S. Pellegrino Terme utilizzando uno specifico protocollo redatto.

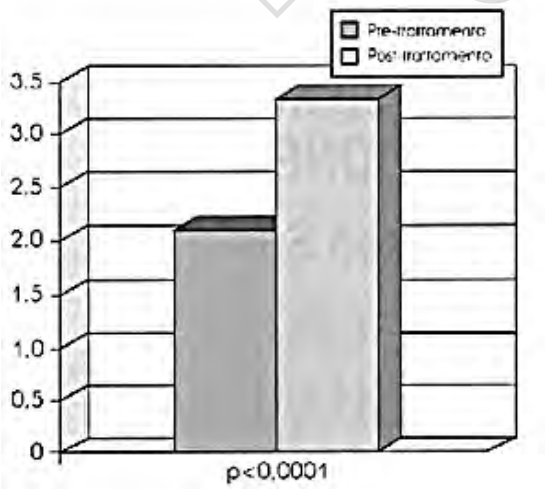

Figure 1.—Grafico con i punteggi pre- e post-trattamento del motor activity log (MAL), sezione qualità.

MATERIALS AND METHODS

Sono stati studiati 24 pazienti, 16 maschi ed 8 femmine di età compresa tra i 19 ed i 76 anni ricoverati presso la clinica "Quarenghi" per esiti di GCA. Di questi 12 erano affetti da esiti di ictus cerebri ischemico, 10 da esiti di trauma cranio encefalico e 2 presentavano esiti di lesione cerebrovascolare emorragica. 18 mostravano paresi lato sinistro e 6 lato destro. Il tempo medio trascorso dall'evento era di circa 4 anni. I soggetti risultavano reclutati secondo i seguenti criteri:

— Presenza di motilità residua attiva all'arto superiore leso con almeno 20° di estensione di polso e di 10° di estensione delle dita;
— Punteggio<50 dell'Action Research Arm (ARA);
— Capacità di deambulare autonomamente senza ausilio di tripode;
— Assenza di afasie severe e punteggio MMSE>22/30;
— Assenza di importanti patologie internistiche associate.

DISCUSSION

I pazienti inizialmente sono stati sottoposti ad esame neurologico, valutazione delle abilità linguistiche e MMSE. Il trattamento è durato 4 settimane consecutive, 5 giorni alla settimana per 6 ore giornaliere secondo tecniche di shaping mantenendo l'arto immobilizzato l'arto sano con uno splint rimovibile solo per dormire, vestirsi, lavarsi. I trattamenti sono stati eseguiti dai terapisti operanti all'interno della struttura sotto la supervisione del medico fisiatra ed utilizzando oggetti d'uso comune (mollette per i panni, costruzioni tipo Lego, posate). Per la valutazione degli effetti sono stati utilizzati i seguenti test: Action Arm Test (ARA), Motricity Index, Funtional Independence Measurement (FIM), Motor Activity Log (MAL) in versione riadattata all'interno della clinica e per l'indagine statistica è stato utilizzato il test t di Student per dati appaiati. Dall'analisi dei dati ottenuti si evidenza come in tutti i test utilizzati si sia riscontrato un miglioramento dei valori (Fig. 1, Fig. 2, Fig. 4), sebbene questo sia stato maggiore nell'Action Arm Test (ARA) (Fig. 3).

RESULTS

Alla fine del trattamento si è verificato un sensibile miglioramento nella capacità di utilizzo dell'arto superiore paretico rispetto all'inizio dello studio ed i risultati più rilevanti si sono verificati nella sezione qualità e quantità del test Motor Activity Log; meno

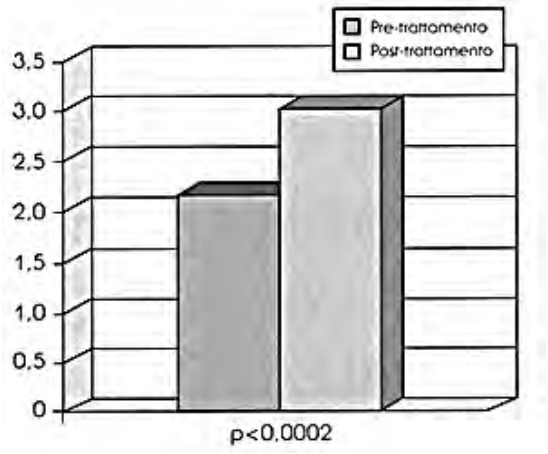

Figure 2.—Grafico con i punteggi pre- e post-trattamento del motor activity log (MAL), sezione quantità.

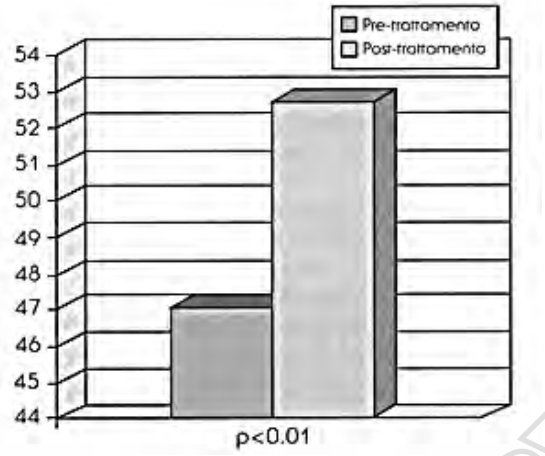

Figure 3.—Grafico con i punteggi pre- e post-trattamento dell'actopm research arm (ARA).

rilevanti, ma comunque significativi anche gli out come della destrezza manuale (ARA) e l'indice di motricità.

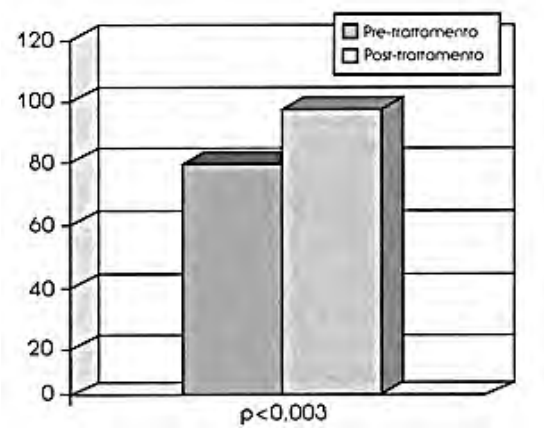

Figure 3.—Grafico con i punteggi pre- e post-trattamento dell'indice di motricità, sezione arto superiore.

CONCLUSIONS

Benché lo studio sia ancora in corso i risultati appaiono molto incoraggianti anche per quelli in cui l'intervallo temporale dall'evento lesivo risultava più lungo. Ciò conferma quanto già precedentemente presentato nei lavori di Van Der Lee *et al.* Tutti i pazienti trattati riceveranno un'intervista telefonica a distanza di un anno per valutare se i miglioramenti persistono.

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BMD of spine in patients with femoral neck fracture

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Osteoporosis (OP) is a bone disorder that is characterized by a reduction in bone density, relative to 'normal' values, and a change in bony microarchitecture, both of which appear to increase skeletal fragility and the associated risk of bone fractures (1). Osteoporosis and fractures are ever-increasing among the aging population. According to the published statistics of Papadimitropoulos *et al.* (2), over 25,000 hip fractures occur in Canada every year. Hip fracture results in death in up to 20% of cases and disability in up to 50% cases. About 70% of the hip fractures are due to osteoporosis (3). The prevalence of osteoporosis or low bone mass at either the femur neck or lumbar spine was not the same as the prevalence of these conditions when the two skeletal sites were considered separately because some individuals had these conditions at one of the skeletal sites but not the other (4). Having osteoporosis raises the risk of experiencing fractures. The prevalence of osteoporosis or low bone mass was higher in women and increased with age. Bone mineral density (BMD) measured by dual-energy X-ray absorptiometry (DXA) is the main determinant of the clinical evaluation of hip fracture risk. Much research has been done in the area of osteoporosis as well as determining the risk of osteoporosis and fracture. Existing works focus mainly on BMD values to determine the risk of fracture. There are many other risk factors that may cause osteoporosis and fractures. Among those risk factors, age and sex are very important. So, all these important risk factors should be taken into consideration, in addition to the BMD value of patients.

The aim of this study was to estimate does BMD of spine is a potential predictor of the fracture in patients with osteoporosis and fracture of the femoral neck (FNF).

MATERIALS AND METHODS

This study was included 136 of the patients (125 female and 10 male), average age of the 65,7±8,9 years (range of 44,1 to 87,3 years). The first group of patients included 36 of the patients with osteoporosis and fracture of the femoral neck. All patients in this group were managed operatively by hip arthroplasty. DXA measurement was performed on Advanced Prodigy Lunar device for these patients postoperatively. Control group included 100 patients with osteoporosis (93 female and 7 male), average age of the 65.1±8,5 years (range of 44,1 to 87,3 years). Age, sex, hight, weight, BMI and BMD of the spine at the level of L1-L4 were estimated. Logistic regression was used to statistical analysis. Dependent variable was presence of the femoral neck fracture and indipendent variables were age, sex, BMI and BMD of the spine at the level of L1-L4.

RESULTS

Table I presents characteristics of study participants. Average age of the participants in our study was 65.7±8.9 yrs (67.2±9.9 for patients with femoral neck fracture and 65.1±8.5 for patients with diagnosis of osteoporosis without fracture). BMI was 26.2±4.1 kg/m2 in the group with femoral neck fracture and 26,5±3,8kg/m2 in the control group. BMD L1L4 was 0,89±0,17g/cm2 in the first and 0,83±0,13g/cm2 in the control group. The results obtained by Logistic regression with the presence of femoral neck fracture as the dependent variable and all confounders (included the BMD L1L4, age, sex and BMI) as independent variables, presented in Table II. BMD L1L4 was significant predictor of differences between patients with and without femoral neck fracture and osteoporosis ($p<0,01$) but age, BMI and sex were not. BMD L1L4 was higher in OP patients with femoral neck fracture than the control group of the patients. It was used to give the "real" differences in BMD L1L4 controlled by the confounders. The dependent variable minority is coded with the reference category 1=FNF (femoral neck fracture) and nonminority category is coded 0=OP (osteoporosis). This is conventional for logistic analysis, which here focuses on the probability that minority =1.

BMD L1L4 was a significant predictor of differences between

Table I.—*Characteristics of study participants (n=136).*

Parameter	Osteoporosis cum femoral neck fracture		Osteoporosis		Total	
	X	SD	X	SD	X	SD
Age (years)	67,2	9,9	65,1	8,5	65,7	8,9
Hight (cm)	160,5	8,7	158,9	6,8	159,4	7,3
Wheight (kg)	67,5	11,9	66,9	10,0	67	10,5
BMI (kg/m^2)	26,2	4,1	26,5	3,8	26,4	3,9
BMD L1L4 (g/cm^2)	0,89	0,17	0,83	0,13	0,85	0,14

Table II.—*Logistic regression with dependent variable of the femoral neck fracture (n=136).*

Parameters	Sig.	Odds ratio (OR) (95 CI)	p -value
Age	0,122	1,038	>0,05
BMI	0,096	0,899	>0,05
BMD L1L4	0,006	118,57	<0,01*
Sex	0,898	0,904	>0,05

Femoral neck fracture is 1. Osteoporosis is 0.

patients with osteoporosis and FNF and patients with osteoporosis only (it was higher for the patients with FNF).

Per increase of one unit of the BMD L1L4, the probability for femoral neck fracture was statistically significant increased (p<0,01) when controlled by the confounders: age, BMI, and sex. BMD of the spine at the level of L1-L4 was significant predictor of the femoral neck fracture (p<0,01) when was controled by other confounders.

DISCUSSION

Osteoporosis caused by loss of bone mineral content, which leads to bone fractures or structural deformations of bone. BMD is one of the major determinants of bone strength and fracture risk (5). However, particularly in clinical practice, a large degree of overlap exists in BMD values between individuals who develop fractures and those who do not (6). To partially answer this problem the current osteoporosis classification criteria drafted by the World Health Organization (WHO) is currently revised to include clinical risk factors. Cranney *et al.* (7) discuss the fracture rates in relation to bone mineral density at different skeletal sites in different age groups (such as age 50-64 years, age 65 years and over) of people. For their research, they did a historical cohort study with a mean observation period of 3.2 years. The study group was constructed from the Manitoba Bone Density Program database. For the study they compared fracture patterns among women 50 to 64 years of age with those among women 65 years of age or older. They evaluated the percentage of osteoporotic fractures and the rates of fracture in postmenopausal women. In their study, they found that most of the postmenopausal women with osteoporotic fractures had nonosteoporotic bone mineral density values. Del Rio *et al.* (8) found in study of the population consisted of 83 subjects with transcervical fractures and 108 control subjects significant lower spine and hip BMD and TBS values for subjects with fractures (p<0,0001). This finding were different in relation to results of our study. Differences were maybe due to different definition of control group, that in our study included patients with osteoporosis without fracture.

Understanding what we know (and do not know) about osteoporosis and femoral neck fracture, as well BMD of spine is critical for improving quality of care for our patients and findings in this study could be useful in practice and in further investigations. Further studies are required to confirm our results in other sets of patients and to better understand the underlying mechanisms of differences between the patients with and without of femoral neck fracture and other factors that may influence on BMD of spine in patients with femoral neck fracture.

CONCLUSIONS

BMD of the lumbar spine was significant predictor of the femoral neck fracture when controled by age, BMI and sex. These results may improve hip fracture risk prediction allowing a better therapeutic strategy for hip fracture prevention.

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Repetitive transcranial stimulation for spasticity treatment of multiple sclerosis patients. Preliminary data

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Multiple sclerosis (MS) is the third cause of moderate to severe disability in patients aged 20 to 50 years. Spasticity is the most common of the many symptoms, with a prevalence of 84%. MS shows a characteristic pattern with flexor muscle involvement in the upper limbs and extensor muscle involvement in the lower limbs. This affects both gait pattern and limb ability, and subsequently patient quality of life. So, many scales have been proposed for spasticity measurement, either directly or indirectly, through MS clinical and/or functional implications. [1]

Repetitive Transcranial Magnetic Stimulation (rTMS) is a noninvasive technique for selective and safe [2] cortical excitability modulation, by inducing remote effects on the excitability of the spinal circuits. Briefly, the technique involves the application of magnetic pulses through the skull, which do not disperse and rapidly induce weak electric currents in cortical neurons. Neuronal activity may be modulated by simple (TMS) or repetitive stimulation (rTMS.)[3,4] The latter may be applied as Intermittent Theta Burst (iTBS,)[4] a short-time, safe stimulation protocol that can also be used as a therapy. It involves applying short trains of theta-frequency magnetic stimuli. In the protocol applied: 10 trains of biphasic, 100μs stimuli, consisting of three 50Hz pulses, repeated at 5Hz every 10 seconds for a total of 600 stimuli (200s.)[5,6] It allows, in all cases, functional, selective and temporal neural network modulation, i. *e*. guiding neural plasticity. Hence, it is considered a technique with potencial for neurorehabilitation.

The aim of this study is to analyze the therapeutic effect of iTBS-rTMS on lower limb spasticity through clinical parameters in patients with relapsing/remitting multiple sclerosis (RRMS) refractory to other treatments.

MATERIALS AND METHODS

We conducted a clinical trial with a placebo or sham group, approved by the Ethics Committee of the Complejo Hospitalario Universitario de Vigo and the Ethics Committee for Clinical Research in Galicia. Placebo treatment was randomized and blind for both examiners and patients. Patients underwent either the aforementioned iTBS experimental treatment or the placebo treatment for two weeks. Application protocol: 10 iTBS-rTMS sessions (Monday to Friday), applied for two weeks on the motor cortex contralateral to the worst-affected spastic lower limb. Assessment: Mondays and Fridays, pre- and post-treatment, for the treatment period, followed by clinical and neurophysiological monitoring for another two weeks to examine effect persistence over time. Data are compared pretreatment, upon completion of all 10 TMS sessions (day 12) and four weeks into the trial. We initially included 11 RRMS patients with lower limb spasticity above 2 (Modified Ashworth Scale, MAS) in any of the 3 muscle groups analyzed: knee flexors and extensors, and ankle plantar flexors. Two out of the 11 patients were eventually excluded and another one dropped out for reasons unrelated to the trial. We present data from the first 8 patients who completed the protocol, 3 experimental and 5 placebo, analyzed through both direct (MAS) and indirect (Penn Scale; analysis of foot sole support and time required for an 8 meter walk, taken from the Hauser index)[1] clinical parameters, and compared with neurophysiological parameters: H/M amplitude ratio.

RESULTS

Clinical data are presented without statistical analysis given the small simple size. Ages range 34-65 years, 48.8 on average. No patient showed side effects.

These are the results obtained from the three treated patients: as for foot sole support, one showed improvement by going from plantigrade to heel-toe walk at the end of the treatment, and the improvement persisted 4 weeks into the trial; the remaining two did not change (Table II). Parameters on MAS improved in all three patients and persisted 4 weeks into the trial (in two out of the three muscle groups analyzed) (Table IV). Parameters on the Penn Spasm Scale improved in two patients at the end of the treatment, but the effect did not persist (Graphic I). Gait speed improved in all three patients upon treatment completion (two of them had minor improvements, but their gait speed was already fairly high). Improvements persisted 4 weeks into the trial.

Table I.—*Foot sole support in placebo group.*

PLACEBO	A	B	C
Patient 1	Plantigrade	Plantigrade	Plantigrade
Patient 4	Plantigrade	Toe-heel	Toe-heel
Patient 8	Toe-heel	Heel-toe	Heel-toe
Patient 9	-	-	-
Patient 11	Heel-toe	Heel-toe	Heel-toe

A: before treatment /B: 12 th day after treatment / C: 4ª week after treatment.

Table II.—*Foot sole support in experimental group.*

TREATMENT	A	B	C
Patient 2	Plantigrade	Heel-toe	Heel-toe
Patient 6	Heel-toe	Heel-toe	Heel-toe
Patient 10	Plantigrade	Plantigrade	Plantigrade

Table III.—*MAS in placebo group.*

PLACEBO		A	B	C
Patient 1	Quadriceps	1	1	1
	Hamstrings	1	1	1
	Triceps surae	2	0	1
Patient 4	Quadriceps	3	3	3
	Hamstrings	3	2	1+
	Triceps surae	2	1+	1+
Patient 8	Quadriceps	1	1	0
	Hamstrings	1	0	0
	Triceps surae	2	1+	1+
Patient 9	Quadriceps	3	2	1+
	Hamstrings	2	1+	1+
	Triceps surae	3	2	2
Patient 11	Quadriceps	1	0	0
	Hamstrings	2	1	0
	Triceps surae	1+	1	1+

As for neurophysiological parameters: average of H/M amplitude ratio decreased in the treatment group from day 1 post-TMS and persisted for 3 weeks (as stated in previous studies, [3,4,6]) but did not persist in the fourth week.

DISCUSSION

No significant differences were found between placebo and experimental groups in the analyzed parameters. However, when comparing clinical data against the placebo group, we found differences in foot sole support analysis: one of the patients in the placebo group showed improvement (4 out of 5 were analyzed, since one of them was not able to walk) (Table I). As for the time required for an 8 meter walk, we also found differences: of all 5 placebo patients, two showed improvement (and one of them so notably that we have concerns about the reliability of the record.) However, when comparing the data on the Penn Spasm Scale, we state improvements in three placebo patients (Graphic I) (this could be explained by the parameter fluctuation.) Parameters on MAS improved at least in one of the three muscle groups analyzed in all placebo patients (Table II). This could be due to differences in the scale application by the researchers. Besides, it is also known that MAS reliability is lower for plantar flexor spasticity due to potential interferences caused by triceps surae retraction. [1] This supports the initial idea of using several clinical scales to complement MAS (the only spasticity scale in TMS studies so far)[3,4,6] as well as to assess different spasticity clinical aspects (critical to quality of life of MS patients,) in order to corroborate iTBS-rMTS potential therapeutic effect and persistence over time.

CONCLUSIONS

At present, the data are inconclusive given the small number of patients analyzed. Other indirect parameters for spasticity measurement should be included when analyzing rTMS therapeutic effect, in order to better assess its clinical impact and better compare against neurophysiological parameters.

Table IV.—*MAS in experimental group.*

TREATMENT		A	B	C
Patient 2	Quadriceps	1+	1+	1
	Hamstrings	1+	1	1+
	Triceps surae	2	1	1
Patient 6	Quadriceps	1+	1+	0
	Hamstrigns	1	1+	0
	Triceps surae	2	1	2
Patient 10	Quadriceps	1+	1+	1
	Hamstings	1+	1+	1
	Triceps surae	2	3	2

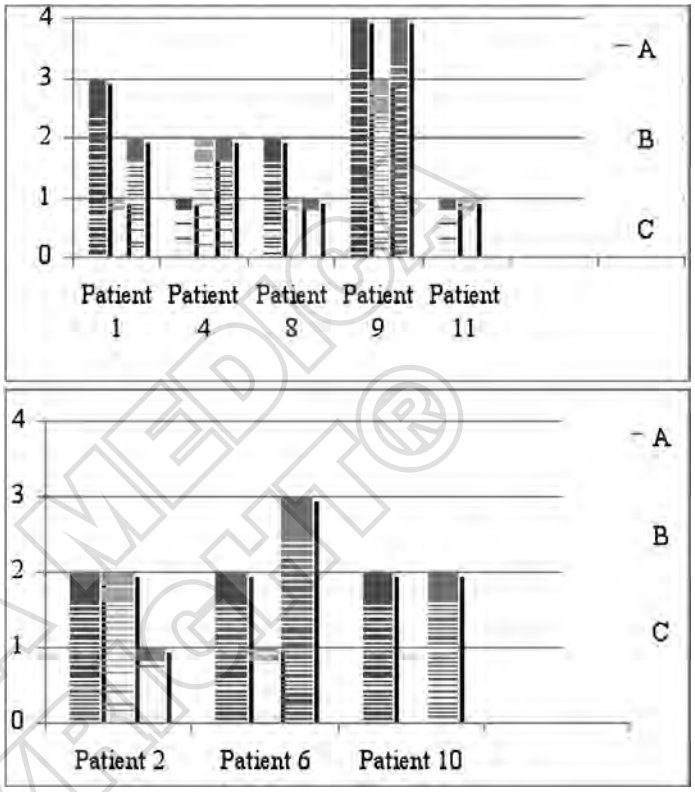

Figure 1.— Penn spasm scale in both groups.

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Facioscapulohumeral dystrophy. A four case review

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Facioscapulohumeral Dystrophy (FSHD), also known as Landouzy-Dejerine Dystrophy, was first described in 1885 and is a progressive, autosomal dominant (4q35), inherited form of muscle degeneration [1]. However, there are cases reported which are the result of new mutations. FSHD prevalence is 1 case in 20,000 persons [1,2]. The usual presentation is in the second decade, with significant variability: facial asymmetry (mostly eye and mouth closure muscles), shoulder girdle involvement (weakness of the stabilizing muscles of the scapula, which results in winged scapula and severe joint balance limitation, with flexion and abduction active movement ranging less than 90º), steppage gait (due to ankle dorsiflexion muscle involvement), hyperlordosis, pelvic tilt and abdominal protrusion [3]. Muscle involvement usually follows the superior-inferior axis, with asymmetry being characteristic of FSHD. Diagnosis is mainly clinical. However, studies such as EMG and muscle biopsy may allow diagnosis orientation, and genetic testing is conclusive.

50% of FSHD patients maintain walking independence, and 10-20% patients eventually require a wheelchair [1].

There is no drug treatment for symptom improvement or progression delay. Kinesitherapy- and orthotics-based rehabilitation treatment is the mainstay therapy [1,2]. We also emphasize the role of ergonomic advice at home and at work, as well as the role of occupational therapy, which allows the adaptation of assistive devices, such as long tweezers and sock removal aids, for day-to-day activities [1]. Besides, wheelchair prescription should also be considered as per clinical progression. In some cases, patients undergo surgery for scapular fixation, either through scapulopexy or scapulothoracic arthrodesis. The latter is the most frequent technique and offers better functional outcome [4].

MATERIALS AND METHODS

We present four FSHD cases, recently evaluated in our department.

Case 1: 29-year-old female. Inherited FSHD. Diagnosed at 10 through genetic testing. Symptom onset at 12: limited motion in both shoulders. Subsequent progressive gait disturbance (steppage.) (Fig. 1)

Case 2: 20-year-old female. De novo FSHD. Diagnosed at 16 through genetic testing. Symptom onset at 14: bilateral facial paresis, limited motion in both shoulders and kyphoscoliosis. Subsequent difficulty to get up from sitting, gait disturbance and marked hyperlordosis. (Figg. 2, 3.)

Case 3: 35-year-old female. De novo FSHD. Diagnosed at 34 through genetic testing. Uncertain onset. Progressive clinical deterioration for the last 7 years: gait disturbance and right shoulder weakness. Subsequent bilateral facial and scapular weakness. (Fig. 4 and 5.)

Case 4: 68-year-old male. De novo FSHD. Clinical diagnosis (pending confirmation through genetic testing). Symptom onset at 66: bilateral shoulder girdle amyotrophy and gait disturbance

Figure 1

Figure 2

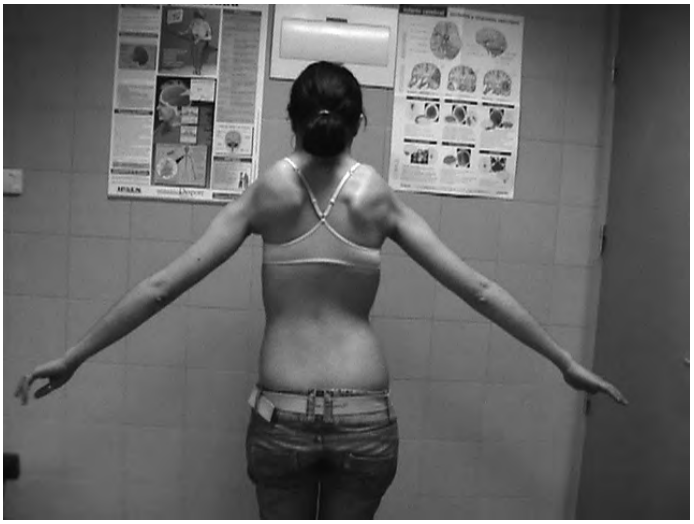

Figure 3

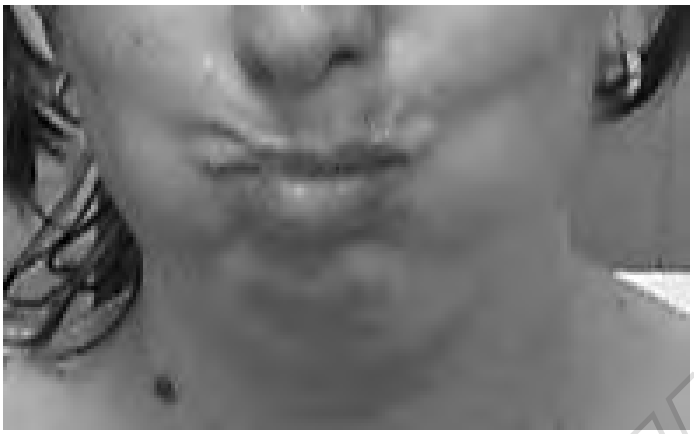

Figure 4

(steppage and marked hyperlordosis). Subsequent mild left facial weakness. (Fig. 6.)

From these cases, we present a review of the rehabilitation treatment for the disease, based on a literature review of the last 10 years.

RESULTS

We present an updated view of FSHD rehabilitation treatment, based initially on kinesitherapy for both muscle balance and joint range maintenance, as well as on facial expression exercises. We stress the importance of hydrokinesitherapy in our experience as a good alternative to prevent muscle fatigue. Even if not referenced in the literatura as a specific treatment, some authors do recommend taking warm baths [1]. We believe orthotic treatment to be key for gait pattern correction, by using ankle-foot orthosis for flaccid-foot drop correction. Indeed, the use of ankle-foot orthoses for both feet in Case 3 allowed not only gait pattern correction, but also stability improvement, thus preventing fall risk. Dorso-lumbar orthosis for hyperlordosis and kyphoscoliosis correction did not prove useful in our patients due to instability following center of mass displacement. Nevertheless, Case 2 occasionally uses an elastic lumbosacral orthosis for pain relief. Scapular fixation surgery was proposed in Case 1 and Case 2 due to severe scapular instability and joint balance limitation. However, both patients refused surgery. All patients have received advice on home adaptations, they remain autonomous for DLA, and only Case 3 requires bilateral canes for gait assistance.

Figure 5

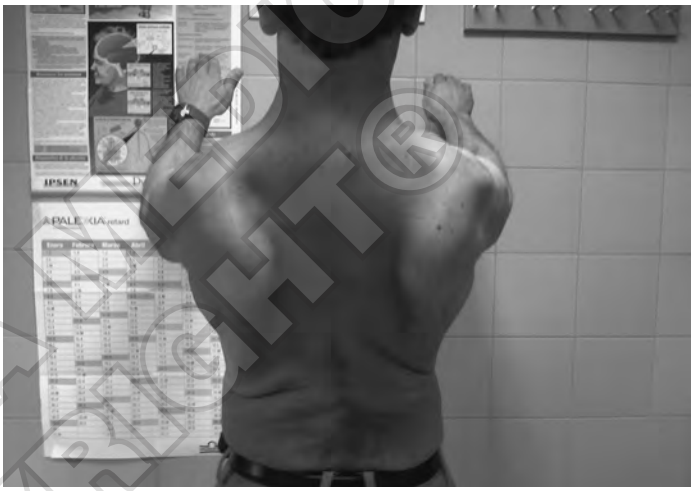

Figure 6

CONCLUSIONS

We stress the importance of symptom onset variability, since symptoms may not match the disease name, which may lead to delayed diagnosis in many cases, as we have seen in some of our patients (late and misleading symptoms, negative muscle biopsies, de novo mutations). We consider rehabilitation treatment central to FSHD patient management, since it allows quality of life improvement, while adapting to their functional needs according to clinical response.

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Early postoperative rehabilitation after radical cystectomy for invasive bladder carcinoma

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One the most demanding procedures in urology is radical cystoprostatectomy for invasive bladder carcinoma.[1] There are various approaches, both single and multimodal.[2] Acceptable indication for radical intervention are high grade carcinomas with no possibility of endoscopic control and infiltrating carcinomas without distant metastatic spreading. Radicality in men is achieved by resection of bladder, prostate and seminal vesicles.[3] Lymphadenectomy of pelvic nodes is performed for staging purposes.[4] In women, radical operation assumes anterior exenteration and urethrectomy.[5,6] It is also required to remove anterior vaginal wall, uterus, adnexa and ovaries.[7] In various series, mortality rate varies from 1% to 3%, while the morbidity rate varies from 25% to 41%. Usual complications include infection, stomal disfunctionality, stenosis, bleeding or stomal ulcerations, peristomal dermatitis, wound infection and iatrogenic injuries od adjacent structures.[8,9]

MATERIAL AND METHODS

From January 2008. to June 2010, we have performed 180 radical cystectomies for invasive carcinoma of bladder at Clinic for urology, Clinical center of Serbia, Belgrade. The study included 150 men and 30 women. Average age of patients was 62,5 ± 10 years (32 to 77 years).

Ureterocutaneostomy was performed in 90 (50%) patients; ileal conduit was performed in 75 (42%) patients; orthotopic continet urinary diversion was performed in 13 (7%) patient, while 2 (1%) patients underwent sigma-rectum pouch method. Patients without any postoperative complication left the hospital between 10th and 21st postoperative day.

RESULTS

Complications following this radical surgical intervention was bleeding, stenosis, ulceration and bleeding from stoma, wound infection and thromboembolic events. Patients with locally advanced disease and metastases in pelvic lymph nodes were treated with the ureterocutaneostomy as a method of urinary diversion. Complication rate in this group of patients was 28%, and they were mostly related to wound healing process duo to accompanying hypoproteinemia and secondary anemia. Overall mortality in this group of patients was 15%. Complications in the group of patients with ileal conduit were present in 9%, while mortality rate was 4%. Most common causes of death were thromboembolic events, sepsis, acute myocardial infarction, pneumonia and DIC. Complication in the group of patients with continent urinary diversion were present in only 5% of them. The most common complications were intestinal obstruction, stercoral and urinary fistulas. These complication usually required reoperation with ureterocuteneostomy or ileal conduit.

Successfulness of early postoperative rehabilitation and physical therapy was measured by number of postoperative hospital days. ($p<0,01$). Patients without stoma placement or ileal conduit have left the hospital faster then patient who have received stoma or ileal conduit. Patients with ureterocutaneostomy were discharged from hospital up to 21 days after the intervention. Rehabilitation protocol included breathing exercises, exercises for periferal circulation, inhalation, verticalisation and kinesitherapy.

DISCUSSION

Good selection of patients and preoperative preparation with adequate early postoperative rehabilitation are very important in preventing postoperative complications.[10] Important part of postoperative rehabilitation include respiratory rehabilitation, kinesitherapy for lower extremities, early verticalisation and intermittent pneumatic compressions.[11,12,13] Preoperative placement of elastic bandages and early mobilization of patients after the surgery reduces thromboembolic complication by about 15%. Physical method, such as tapping for mucus discharging and breathing exercises help in prevention of pneumonia, atelectasis and acute respiratory distress syndrome. Providing the patients with the possibility of early walking or independent personal hygiene has positive effect on patients psychological status and can lead to faster healing.

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Valutazione di screening dell'osteoporosi in una popolazione di pazienti ricoverati in riabilitazione intensiva

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L'osteoporosi (OP) costituisce un problema di rilevanza sociale. La sua incidenza aumenta con l'età sino ad interessare la maggior parte della popolazione oltre l'ottava decade di vita. Si stima che ci siano oggi, in Italia, circa 3,5 milioni di donne ed 1 milione di uomini affetti da OP. In previsione del fatto che nel prossimo ventennio la percentuale di popolazione italiana al di sopra dei 65 anni d'età aumenterà del 25%, ci si attende un proporzionale incremento dell'incidenza di tale patologia. Il rischio per un soggetto osteoporotico manifesti una frattura a carico del polso, corpi vertebrali o femore prossimale è del 15% circa per ogni sito specifico e del 40% per tutti i siti. Le fratture osteoporotiche hanno importanti implicazioni sociali ed economiche oltreché sanitarie; infatti i pazienti con frattura del femore (FF) prossimale presentano nell'anno successivo alla frattura un tasso di mortalità del 15-30%. Tra gli anziani le fratture sono una della maggiori cause di mortalità, la cui incidenza è sovrapponibile a quella da ictus e carcinoma della mammella. Il 50% delle donne con frattura di femore presenta inoltre una consistente riduzione del livello di autosufficienza e, in circa il 20% dei casi, richiede una istituzionalizzazione a lungo termine [1].

In una paziente con una frattura vertebrale (FV), la probabilità di incorrere in un' altra frattura del rachide entro un anno dalla prima risulta quintuplicata, mentre quella di subire una FF aumenta di quasi sei volte [2]. Ad un anno dalla frattura di femore (FF) il 40% dei pazienti non è in grado di deambulare in modo autonomo, ed il 60% è limitato nelle ADL, mentre l'80% delle persone divenute dipendenti viene istituzionalizzato [3]. L'impatto economico della frattura osteoporotica, solo analizzando le spese ospedaliere, è dunque altissimo, pari a 10 miliardi di ollari negli USA e 3,5 miliardi di euro in Europa [4]. Inoltre più dei due terzi delle FV non vengono diagnosticate, mentre secondo uno studio tedesco solo il 19% dei soggetti in cui viene rilevata una FV riceve un trattamento, e nei casi in cui questo avviene, spesso viene limitato alla fase acuta mentre la gestione a lungo termine per la prevenzione di ulteriori fratture è riservata ad una minoranza di soggetti [5].

Si tratta dunque, secondo l'OMS, una delle problematiche più urgenti da affrontare, preceduta solo dalle patologie cardiovascolari. Nonostante le linee guida internazionali consiglino di trattare l'OP con l'associazione di Calcio, vit D e farmaci antiosteoporotici in grado di ridurre significativamente il rischio di fratture (fino al 50%)[6], la percentuale di pazienti trattati è bassa [7]. La prevenzione degli eventi fratturativi secondari ad OP tra gli ultraottantenni, in considerazione dell'elevata moratlità e diasabilità ad essi correlata rappresenta un problema di good clinical practice, tant'è vero che l'international Osteoporosis Foundation ha già da tempo richiesto l'impegno a tutti i medici di medicina generale e gli specialisti affinché, ad ogni età, sia intrapreso un trattamento farmacologico idoneo a fronteggiare la più importante causa di fratture in età avanzata ovvero l'OP[8].

Alla luce dell'importanza del problema OP emerge il significato di prevenire l'evento fratturativo e a tal fine di analizzare i principali fattori di rischio correlati; in particolare i fattori di rischio con livelli di evidenza 1a per OP sono l'età, la terapia cronica steroidea, la menopausa prima dei 45 anni, il ridotto apporto di calcio; ad aumentare il rischio di frattura da fragilità si aggiungono ai precedenti anche la ridotta massa ossea, una frattura da fragilità dopo i 40 anni, l'abitudine tabagica e una predisposizione alle cadute. Ne deriva che la sola valtazione della massa ossea è adeguata per la diagnosi di osteoporosi, ovvero per identificare la cosiddetta "soglia diagnostica", ma non è sufficiente per identificare correttamente un soggetto a rischio di frattura, ovvero per stabilire la soglia terapeutica [1].

Infine è da ricordare che un trattamento efficace dell'OP deve prevedere l'integrazione di una terapia farmacologica con un programma di mangement riabilitativo [9].

I programmi di esercizio consigliati per prevenire le fratture osteoporotiche nei pazienti anziani non possono prescindere da una valutazione fisiatrica individualizzata compreso il livello di densità minerale ossea rilevata strumentalmente. In generale infatti in un paziente osteopenico l'esercizio fisico può essere più intenso che nel paziente con franca osteoporosi, date le implicazioni muscoloscheletriche. La rilevazione di fratture vertebrali, indicatore clinico di un grado severo di OP deve guidare il fisiatra alla selezione di esecizi efficaci ma compatibili (per esempio, per il rachide, devono essere privilegiati esercizi di estensione in posizione seduta e con una progressione di impegno muscolo-scheletrico individualizzato e sempre graduale)[9]. È da questi presupposti che si rende nessaria in una corretta pratica clinica e gestione delle risorse un'attenzione particolare nel campo sanitario mirata all'individuazione precoce e a programmi di prevenzione primaria o secondaria di soggetti ad aumentato rischio di frattura.

MATERIALI E METODI

È stato istituito nel nostro Ospedale un protocollo di screening e presa in carico diagnostico- terapeutica con l'obiettivo di individuare precocemente e trattare in maniera multidisciplinare i pazienti con aumentato rischio fratturativo da OP. La popolazione di questo studio preliminare è stata quella di tutti i pazienti degenti c/o la UO di Medicina Riabilitativa INRCA ANCONA nel periodo gennaio–giugno 2012. Sono stati inclusi i soggetti che presentavano durante tutta la durata del ricovero una sostanziale stabilità

Tabella I. — *Check list fattori di rischio*

Fattori di rischio di fratture osteoporotiche	Sesso
	Età*
	Patologia
	Amenorrea primaria o secondaria
	Ipogonadismo maschile primitivo o secondario
	Etnia europea o asiatica
	Storia di fratture atraumatiche
	Bassa densità minerale ossea (BMD)
	Trattamento cortisonico
	Elevato turnover osseo
	Familiarità per frattura di femore
	Scarsa acuità visiva
	Basso peso corporeo
	Malattie neuromuscolari
	Fumo di sigaretta
	Eccessivo consumo di alcoolici
	Immobilizzazione protratta
	Basso apporto di calcio
	Carenza di vitamina D
Malattie endocrine	Ipercortisolismo
	Iperparatiroidismo
	Ipertiroidismo
	Iperprolattinemia
	Diabete mellito tipo I
	Acromegalia
	Deficit GH
Malattie ematologiche	Mieloma multiplo
	Mastocitosi sistemica
	Talassemia
Malattie endocrine	Morbo celiaco
	Malattie infiammatorie croniche gastro-intestinali
	Gastrectomia
	Intolleranza al lattosio
	Malassorbimento intestinale
	Insufficienza pancreatica
	Artrite reumatoide
Malattie reumatiche	LES
	Spondilite anchilosante
	Artrite psoriasica
	Sclerodermia
Malattie renali	Acidosi tubulare renale
	Insufficienza renale cronica
Altre condizioni	Anoressia nervosa
	Emocromatosi
	Fibrosi cistica
	Malattie metaboliche del collagene (osteogenesi imperfecta, omocistinuria, Ehlers-Danlos, Marfan, ecc)
	Trapianto d'organo
	Tossicodipendenza
	Fumo
	Alcoolismo

clinica, mentre sono stati esclusi i pazienti con comorbosità importanti o disabilità gravi che non permettevano l'esecuzione dell'esame US falangi. I pazienti sono stati sottoposti ad una prima fase investigativa comprensiva della rilevazione clinico-anamnestica dei fattori del rischio fratturativo tramite la compilazione di un' anamnesi guidata per identificazione di forme di OP senile (tabella I).

Nell'ambito della fase valutativa sono stati analizzati anche fattori con livello di evidenza minore che comunque in un'analisi globale possono contribuire alla determinazione del rischio fratturativo, alcuni dei quali modificabili o contenibili con un corretto stile di vita.

Infatti i diversi fattori di rischio si presentano con diversi livelli di evidenza ma con un effetto cumulativo nella determinazione della predisposizione alla frattura che è difficile comprendere esaustivamente in uno specifico algoritmo; nel tentativo quindi di valutare tutti i fattori di rischio conosciuti per OP e fratturativo nel nostro studio pertanto è stata utilizzata una check-list mirata con dati clinico-anamnestici e analisi dei fattori di rischio per OP senile e secondaria (tabella.1); queste informazioni sono state inoltre integrate, in alcuni casi selezionati ad aumentato rischio fratturativo ipotizzato, con la valutazione di esami sierici ed urinari specifici mirati ad

Tabella II. — *Quantificazione rischio, Ultrasuonografia e Terapia*

Dati campione degenti					Quantificazione rischi frattura a 10 anni (osteoporosis 2005)									Ultrasuonografia			
Sesso	Età*	Patologia	Immobilizzazione prolungata	Grave disabilità	Precedenti fratture vertebrali e non	Trattamento cs > tre mesi	Trattamento cs cronico	Fumo > 10 sig/die	Menopausa < 46 anni	Artrite reumatoide	Classe rischio di frattura a 10 anni	% Di rischio (%)	Storia familiare per frattura ospetoporotica	T-score	Z-score	Nota 79	Terapia con bifosfonato
F	87	Frattura femore	SI	NO	SI	NO	NO	NO	NO	NO	elevato	14,29	NO	-5,63	-2,24	SI	
F	78	Cardiaca	SI		NO	NO	NO	NO	NO	NO	medio alto	7,77	NO				
F	71	Frattura femore			NO	NO	NO	NO	NO	NO	elevato	13,14		-5,41	-2,47	SI	
M	85	Paraparesi da mileopatia ischemica	SI		NO	NO	NO	NO	\	NO	basso	0		NO	NO	NO	
M	75	Tetraparesi in polineuropatia			NO	NO	NO	NO	\	NO	basso	0		NO	NO	NO	
F	74	Artroprotesi anca				NO	NO	NO	SI	NO	medio	5,48	NO	-3,66	-0,57	SI	nessuna
F	71	Artroprotesi anca				NO	NO				medio alto	6,75	NO	-3,97	-1,03	SI	nessuna
F	45	Amputazione	SI		NO	NO	NO	SI	NO	NO	basso	0	SI	-2	2	NO	
F	78	Artro ginocchio				NO	NO	NO	SI	NO	elevato	9,42	NO	-4,69	-1,36	SI	
F	76	Artro ginocchio				NO			SI		elevato	21,39		-6,73	-3,46	SI	nessuna
F	71	Frattur femore			SI	NO		NO	NO	NO	elevato	10,28	NO	-1,87		SI	nessuna
F	87	Esa	SI	SI	NO	NO			NO	NO	medio alto	6,16	NO	-3,8	-0,41	SI	
F	76	Artro ginocc	SI	SI	NO	NO	NO	NO	NO	NO	medio alto	6,1		-5,69	-2,46	SI	
F	93	Frattura femore			SI	SI	SI		SI		elevato	15,46	NO	-5,79	-2,4		difosfo
F	72	Frattura femore									medio alto	7,83		-4,34	-1,33		policoframacotp
M	72	Emorragia cerebrale		SI	NO						medio basso	3		-3,24	1,22	NO	nessuna poliframac-
F	51	Artro ginocchio						NO	SI	NO	medio basso	1,94	NO	-1,48	-0,94		

• Condizioni di prescrivibilità del farmaco

escludere eventuali forme di OP secondaria. Al fine inoltre di permettere un inquadramento clinico-funzionale globale del paziente si è proceduto inoltre alla valutazione specialistica fisiatrica. La fase valutativa ha compreso inoltre un fase strumentale con l'esecuzione di esame un densitometrico di screening mediante Ultrasuonografia delle falangi. Tale apparecchio è risultato a disposizione di questa UO in alcune giornate prestabilite (in media 2 vv/mese).

Grazie all'elaborazione del software dell'apparecchiatura che combina i valori di BMD ricavati dall'US grafia della falangi con i principali fattori di rischio clinici,[10] si sono ottenuti i valori di T-score e Z-score nonché il livello di rischio fratturativo a 10 anni espresso in percentuale ed in classi di rischio (Tabella II).

Per i soggetti ad aumentato rischio di frattura venivano successivamente applicati programmi di prevenzione e/o trattamento, di tipo farmacologico e non e nei pazienti a maggior rischio di frattura veniva garantita un monitoraggio clinico e strumentale ambulatoriale.

RISULTATI

Sono stati inclusi 17 soggetti, di età 74 ±11,9. 14 F e 3 M, affetti da patologia neurologica (N°4), cardiaca (N° 1), fratture di femore (N° 5), esiti di recente intervento protesico per patologia artrosica (N° 6), amputazione arto inferiore (N° 1), afferenti in reparto di degenza di Riabilitativa intensiva. La valutazione degli indici ultrasonografici unitamente a quella del rischio di frattura a 10 anni dedotta dall'analisi dei fattori di rischio, mostra un' elevata incidenza di osteoporosi nella popolazione in studio; in particolare, il 35% della popolazione mostrava una classe di rischio elevata (il 43% se riferito ai soggetti di sesso femminile), il 30% medio alta (il 36% se riferito ai soggetti di sesso femminile), il 6% media, il 12% medio bassa, e il 17% nessuna.; a seguito della valutazione della classe di rischio, tutti i pazienti con classe di rischio da medio-bassa ad elevata pari all'83% dei soggetti, sono stati avviati a programmi riabilitativi con lo scopo di ridurre il rischio di caduta e fornire norme dietetiche e stili di vita adeguati; in aggiunta, sulla base dell'analisi clinica globale dei pazienti, al 35% dei pazienti è stato prescritto una terapia farmacologica specifica (Figura 1-2).

Coloro che presentavano una classe di rischio media venivano avviati ad un programma di integrazione alimentare, quelli con classe medio-alta ad integrazione con Calcio e/o Vitamina D, quelli ad elevato rischio, a terapia integrativa con Calcio e/o vit.D e farmaci specifici (o antiriassorbitivi o ad azione mista). I pazienti infine, con classe di rischio medio-alta ed elevata venivano presi in carico dal Servizio ambulatoriale della nostra UO per programmi riabilitativi specifici individuali o di gruppo per OP (tabella II).

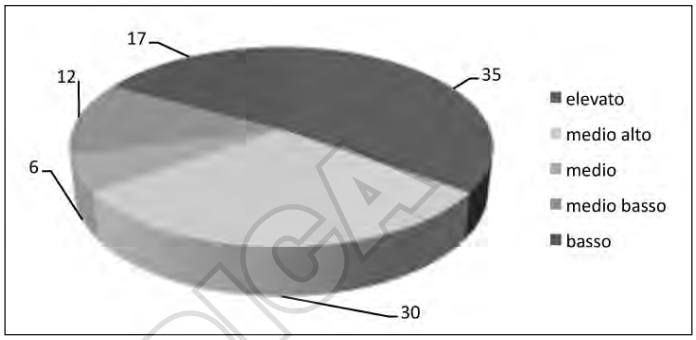

Figura 1. — Anni (popolazione in studio)

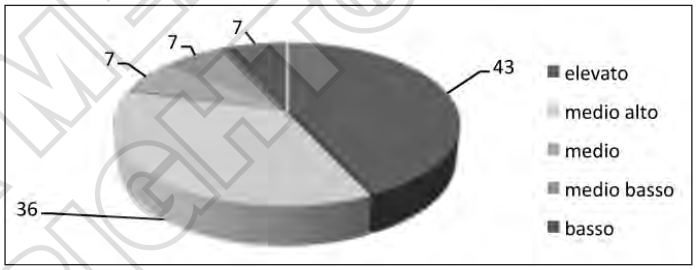

Figura 2. — Anni (popolazione in studio di sesso femminile)

		Controindicazioni a terapia farmacologica	Terapia in osteoporosi secondaria diagnosticata	Strategie di contenimento del rischio di caduta	Trattamento riabilitativo individuale (degenza)	Trattamento specifico osteoporosi (ambulatoriale)
					SI	
					SI	
					SI	
					SI	
					SI	
				SI	SI	
pz da escludee TVS				SI	SI	SI
		TVS Trombosi venosa superficiale		SI	SI	SI
		TVP ed embolia polmonare		SI	SI	SI
		SI	trattamento sprcificonefrologico	SI	SI	SI
		SI		SI	SI	SI
TVP ed embolia polmonare				SI	SI	SI
	Osteoporosi secondaria, trattamento nefrologico			SI	SI	SI
				SI	SI	SI
				SI	SI	SI
				SI	SI	SI
				SI	SI	SI

DISCUSSIONE

A conferma dei dati di letteratura, da cui risulta che sia la diagnosi di OP nella popolazione generale è spesso sottostimata e anche nei soggetti con OP spesso non viene seguita nessuna terapia, nel nostro studio è emerso che nessuno dei pazienti della popolazione in studio era mai stato sottoposto ad un qualche tipo di trattamento antiosteoporotico [11]. Da uno studio condotto su 13490 soggetti emerge che la predizione del rischio di frattura aumenta nettamente con l'uso combinato della BMD e dell'analisi dei principali fattori di rischio clinici; in particolare, a tal fine, gli autori hanno sviluppato un algoritmo sul rischio di frattura che rende possibile l'identificazione dei soggetti da sottoporre a trattamento sulla base dei vaori di BMD ricavati dall'US grafia della falangi in combinazione ai fattori di rischio clinici per la determinazione del livello di rischio di frattura a dieci anni.

In conclusione, è fondamentale ottimizzare l'uso del valore della BMD su soggetti che risultano ad elevato rischio di frattura combinato sulla base dei dati cinici ed anamnestici al fine di ottimizzare la terapia e ridurre i costi socio-economici derivati dalle fratture [10]. Partendo dal dato che la prescrizione intra-ospedaliera della terapia anti-osteoporotica a pazienti fratturati incoraggia il medico di medicina generale a proseguire il trattamento [11], abbiamo voluto studiare la popolazione dei degenti al fine di individuare e trattare precocemente i pazienti prima che sviluppassero l'evento fratturativo. In considerazione del fatto che l'aumentato rischio di FF nei soggetti ultraottantenni non dipende solo dalla resistenza dell'osso, ma anche da un'aumentata propensione alla cadute e alla perdita dei riflessi di protezione, tutti gli studi post hoc su vari farmci indicati per il trattamento dell'OP hanno evidenziato un' efficacia nel prevenire le FF solo quando viene selezionato un campione di pazienti con un ben definito rischio di frattura correlato all'osso, ovvero la presenza di un'OP conclamata; è proprio su questo fondamento che il protocollo di studio è stato elaborato.

L'importanza del carico meccanico applicato sull'osso è stato dimostrato indurre la differenziazione degli osteoblasti. Inoltre alcuni autori indicano l'esercizio fisico con carico, essere in grado di aumentare la massa ossea in età prepuberale e di mantenerla in età adulta ed anziana indipendentemente dal fattore genetico. La tipologia di un programma efficace dovrebbe pertanto includere esercizi di resistenza e di impatto per mantenere non solo la qualità delle ossa corticali e trabecolari ma anche della massa muscolare. Sarebbe utile, dove necessario, l'adozione di tecniche di protezione delle articolazioni per minimizzare l'impatto dell'artrosi sulla capacità di esercizio; da consigliare inoltre il mantenimento di una regolare attività fisica nella vita quotidiana come strumento per ridurre significativamente il rischio di fratture da OP. In soggetti osteoporotici anziani con fratture in sede vertebrale o femorale l'enfasi nel mantenere la forza muscolare sia nei muscoli del tronco che degli AAII, combinato con esercizi di equilibrio e posturali, ridurrà non solo le cadute future ma migliorerà globalmente la qualità di vita. [12].

CONCLUSIONI

L'ipotesi che il rischio di frattura da OP nel paziente geriatrico sia sottostimata suggerirebbe di eseguire, nei pazienti che risultino dall'esame dei fattori di rischio ad aumentata probabilità di essere osteoporotici o di sviluppare fratture da fragilità, la valutazione US falangi come supporto strumentale, anche al fine di definire il criterio di rimborsabilità dei farmaci. Nel protocollo presentato sono insiti dei criteri di fattibilità nella pratica clinica quotidiana, sprattutto per il fatto che alcuni step della fase valutativa e della fase più strettamente fsioterapica appartengono della gestione di tutti i pazienti in riabilitazione intensiva; la presa in carico del paziente avviene infatti fin dall'ingresso in UO e prevede alcuni passaggi che vengono eseguiti di routine al ricovero (valutazione fisiatrica, rilevazione del livello di autonomia premorbosa, definizione prognostica funzionale), a cui si affiancano elementi valutativi nuovi (come l'anamnesi mirata e velocizzata dalla check list) che vanno integrati dal fisiatra specialista in OP in maniera sistematica ed approfondita con i dati di comorbosità, valutazione del rischio di caduta, etc; il fisiatra specialista per op, in base alla valutazione clinico-strumentale e globale del paziente, comprendente valutazione dei dati di laboratorio di routine ed eventualmente mediante un approfondimento mirato, predispone un programma di profilassi primaria a tutti i pazienti e di profilassi secondaria ai pazienti con OP; anche di routine è ovviamente l' elaborazione ed applicazione, per ogni singolo soggetto al momento del ricovero del progetto riabilitativo individualizzato con il contributo per competenza gli operatori di reparto coinvolti nella fase riabilitativo-assistenziale-fisioterapisti, infermieri ed OSS.

Il presente studio pilota ha mostrato, seppur limitato dal breve periodo di esecuzione ed osservazione, la rapidità, maneggevolezza e costo contenuto nell' esecuzione della valutazione ultrasonografica delle falangi in pazienti ricoverati. Lo studio presentato è la fase preliminare di una sperimentazione attualmente in corso, che ha avuto tra i suoi obiettivi quello di valutare la fattibilità del protocollo di presa in carico del paziente anche successiva alla dimissione. Infatti il paziente, una volta identificato durante la fase di degenza ospedaliera come a rischio di OP o di frattura da fragilità, viene seguito longitudinalmente nell'ambulatorio dedicato all'OP ed eventualmente indirizzato nella definizione diagnostico-terapeutica di forme secondarie di OP ad una valutazione endocrinologica specialistica. In linea teorica questo protocollo clinico e strumentale può supportare la gestione clinica di OP con individuazione e trattamento precoce di pazienti a rischio di fratture osteoporotiche.

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Multi-faceted benefits of rehabilitation in adults affected by severe haemophilia: a case report

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Haemophilia A and B are hereditary X-chromosomal recessive bleeding disorders caused by deficiency or absence of coagulation factors VIII (encoded by F8) or IX (encoded by F9), respectively.[1]

The disorders are classified into three categories according to the coagulation factor activity present in blood: severe (< 1%), moderate (1-5%), or mild (> 5% to < 40%).

The prevalence of hemophilia A is 1 in 5000 male live births, and that of hemophilia B is 1 in 30.000.[2,3]

The earliest documentation on haemophilia occurred in the fourth century AD Talmud and in Rabbinic writings thereafter. Haemophilia has been called a royal disease because Queen Victoria was a carrier of haemophilia B, and her descendants passed the mutation to various royal houses across Europe (including those of Spain, Germany and Russia).[4]

The hallmark haemophilic bleeding manifestation is intra-articular bleeding (haemarthrosis). Such a manifestation is more frequent in the severe form of the disease, and the most affected joints are usually elbows, knees and ankles. In adult patients with severe haemophilia (PWH), particularly those with inhibitors, a history of recurrent bleedings leads to a condition of chronic haemophilic arthropathy, characterized by synovitis as well as by the destruction of articular cartilage and subchondral bone.

Chronic arthropathy is a complication causing severe pain, deformity, loss of motion, functional disability, muscle atrophy, muscle weakness and disturbance of gait and balance.[5]

In particular, studies of SEMG (Surface EMG) dimostrated that ankle joint integrity appears to be reduced in haemophilic persons, with consequences on the neuromuscular control of upright posture.[6,7]

In haemophilia, physical and/or sporting activities were not recommended until the Seventies. Today it is strongly recommended that PWH engage in a regular physical activity (especially in swimming) and perform a specific exercise regimen.[8,9] This should be conceived by a haemophilia multidisciplinary team including an appropriately trained physiotherapist.[10]

Such an approach proves to have positive effects on the prevention of articular and muscular bleeding as well as on the control of musculoskeletal complications. Moreover, it improves cardiovascular function, reduces the risk of obesity and several metabolic diseases, and contains the incidence of falls, osteoporosis and osteoporotic fractures. In sum, a regular physical activity can substantially improve the quality of life of PWH.[11]

Exercise programmes undertaken from two to three times a week for at least 12 weeks seem to be very effective in reducing the impact of age-related changes on the musculoskeletal system.[5]

An interesting approach to haemophilic arthropathy is the use of Intra-articular injections (IAIs) of hyaluronic acid (viscosupplementation), combined with therapeutic exercise.[12,13]

In particular, the present study has been aimed at evaluating the effects of therapeutic exercise on adults patients with severe haemophilia.

MATERIALS AND METHODS

The present survey has focused on the case of a 46-year-old man affected by severe haemophilia A. The patient was HCV-positive and followed a personalized prophylaxis. He was enrolled in the study by the Physical Medicine and Rehabilitation Staff of "Mantia Medical Center" (Palermo).

A careful biomechanical evaluation, measuring AROM (Active Range Of Motion) with a goniometer, pointed out that the most affected joints were elbows (fig.2), ankles and knees. Furthermore, the same evaluation detected elbows and knees swelling, flexion and extension loss, severe muscle atrophy and moderate crepitus on motion.

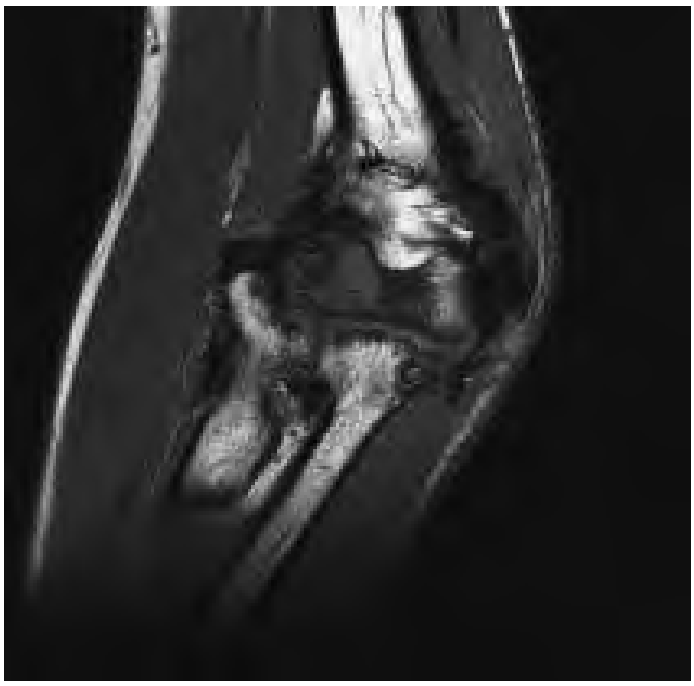

Figure 1.— MR image of the Elbow.

Figure 2.— Active R.O.M. of the left elbow at T0.

Figure 3.— Active R.O.M. of the left elbow at T2.

The severity of damage was classified using conventional radiographical staging and Magnetic Resonance (MR).[14] (fig.1)

MR imaging is a more effective technique than conventional radiography and Computed Tomography (CT) in order to detect abnormal changes. When evaluating adults with haemophilia, it should be considered the first choice among imaging modalities. In the case of our patient, the MR image of elbows (especially of the left elbow), knees and ankles showed joint erosions, bone marrow oedema, synovial hypertrophy, joint cysts and osteoporosis.

An appropriate physiotherapic treatment was performed 3 times a week, 2 hours a day for 6 months. It included passive mobilization of joints, strength training, electrical stimulation of muscle trophism, PNF (Proprioceptive Neuromuscular Facilitation) techniques, balance and flexibility activities.

Assessment employed the Visual Analogic Scale (VAS) for pain evaluation and the Haemophilia Joint Health Score (HJHS) for musculoskeletal status.[15] HJHS measures 8 items (swelling, duration of swelling, muscle atrophy, crepitus on motion, flexion loss, extension loss, joint pain strength) in the most affected joints (elbows, knees and ankles) and calculate Global Gait Score (walking, stairs, running, hopping on one leg).

The levels of functional independence in daily life, as well as in transfers and mobility, have been evaluated on the basis of the Functional Independence Score for Haemophilia (FISH).[16,17]

FISH measures the patient's independence in performing seven activities under three categories: self-care (grooming and eating, bathing and dressing), transfers (chair and squatting) and locomotion (walking, step climbing and running). Each function is graded from 1 to 4 depending on the amount of assistance needed in performing the function.

The patient's data were recorded before the beginning of the exercise programme (T0), with follow-up at 3 months (T1) and 6 months (T2).

RESULTS

VAS (ref. score 0-10) decreased from 7 at T10 to 5 at T1 (T1 vs. T0: $P<0.05$) and 2 at T2 (T2 vs. T1: $P<0.005$).

HJHS was 35 at T0 (ref. score 5-50), 21 at T1 and 11 at T2 (table I)

In general, the most satisfactory results regarded ankles and elbows (fig.2,3).

FISH (ref. score 13-28) was 14 at T0, 19 at T1 and 25 at T2 (table II).

CONCLUSIONS

The case considered here provided consistent evidence for fruitfulness of rehabilitation in adults with severe haemophilia A. Even if adult haemophilic patients frequently show relevant complications affecting the musculoskeletal system[18], their general condition can be remarkably bettered through an appropriate physiotherapic approach.[10,19] Such an approach is able to reduce chronic pain and disability as well as to cut down on the use of oral anti-inflammatory drugs. Likewise, in a high percentage of patients the recourse to operative treatments can be avoided or delayed.

The present study has also pointed out that the Ultrasound-guided intra-articular injection of hyaluronic acid can be usefully combined with therapeutic exercise (especially in the haemophilic anthropathy of knee joints). Indeed, viscosupplementation seems

Table I.—*Haemophilia Joint Health Score (HJHS) at T2.*

	Left Elbow	Right Elbow	Left Knee	Right Knee	Left Ankle	Right Ankle
Swelling	0	0	0	0	0	0
Duration (swelling)	0	0	0	0	0	0
Muscle Atrophy	1	0	1	1	0	0
Crepitus on motion	0	0	0	0	0	0
Flexion Loss	1	0	1	1	1	0
Extension Loss	1	1	1	0	0	0
Joint Pain	0	1	0	0	0	0
Strength	0	0	0	0	0	0
Joint Total	3	2	3	2	1	0

Sum of Joint Total + Global Gait Score: HJHS Total Score (11)

Table II.—*Functional Indipendence Score in Haemophilia (FISH) at T0, T1 and T2.*

A. Self Care		T0	T1	T3
1. Eating and grooming	○ 1 ○ 2 ○ 3 ○ 4	3	4	4
2. Bathing	○ 1 ○ 2 ○ 3 ○ 4	3	4	4
3. Dressing	○ 1 ○ 2 ○ 3 ○ 4	2	3	4
B. Transfers				
4. Chair	○ 1 ○ 2 ○ 3 ○ 4	2	2	3
5. Squatting	○ 1 ○ 2 ○ 3 ○ 4	1	2	3
C. Locomotion				
6. Walking	○ 1 ○ 2 ○ 3 ○ 4	1	2	3
7. Stairs (12-14 steps)	○ 1 ○ 2 ○ 3 ○ 4	1	1	2
8. Running	○ 1 ○ 2 ○ 3 ○ 4	1	1	2
Total Score		14	19	25

to be an effective therapeutic strategy in haemophilic arthropathy[12,13], and further research on its combination with therapeutic exercise should definitely be encouraged.

In more general terms, a significant improvement of life quality and a higher degree of social participation can be reasonably expected to arise as results of similar treatments.

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Reading and writing skills in crossed aphasia: A single-case study

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Crossed aphasia (CA), firstly reported by Bramwell (1899), is an acquired language impairment in which a right hemisphere (RH) lesion leads to aphasia in a right handed person. This peculiar pattern of atypical cerebral dominance has been comprehensively described only in few cases and its prevalence is estimated to be in the range of 0.39-3% of total cases of aphasia (Bhatnagar *et al.*, 2011). Although classically only non-fluent aphasia has been described in CA, nowadays, with over 200 cases cited in the literature, all the main aphasia syndromes (expressive, receptive, conduction, anomic, and global) have been reported. From a neuroanatomical point of view, lesions associated with CA can be either cortical or subcortical (thalamus, caudate nucleus, portions of the internal capsule, and periventricular white matter). Even though oral language comprehension and production have been extensively studied, less is known as for reading and writing abilities associated with CA.

In this paper we describe a case of CA in a brain-damaged patient (E.C.) native speaker of Italian, a shallow orthography language. The patient suffered from a middle-cerebral-artery stroke, following dissection of the internal carotid artery (see Fig. 1).

We extensively tested oral language and visuo-spatial functions, along with reading and writing skills, that we aimed to study in the light of the information-processing model of word naming, confrontation and writing (Patterson, 1986; Luzzatti *et al.*, 1998, see Fig. 2).

MATERIALS AND METHODS

E.C. was presented with the following tasks: (i) the Italian version of the Aachen Aphasia Test (AAT, Luzzatti, Willmes & DeBleser, 1996); (ii) Naming pictures selected from the Snoodgrass and Vanderwart's (1980) series; (iii) Repetition of words and nonwords; (iv) Oral lexical decision; (v) Reading aloud of words and nonwords (Toraldo *et al.*, 2006); (vi) Reading aloud of words with unpredictable stress position (Twus, Toraldo *et al.*, 2006); (vii) Written lexical decision; (viii) Semantic categorization; (ix) Writing (Luzzatti *et al.*, 1998). Also the attentional and visuo-spatial functions were tested by means of the following tasks: (x) Lines bisection; (xi) Albert's barrage test. Last, handedness has been assessed with the Edinburgh Handedness Inventory (EHI, Oldfield, 1971).

RESULTS

Language examination using the Italian version of the AAT demonstrated the existence of non-fluent crossed aphasia, characterized by the production of short sentences, severe anomic word-finding difficulties and a number of phonemic errors. E.C. is unambiguously a right-handed patient, since he obtained a score of 100/100 at the EHI. In the naming task, E.C. correctly named 58/80 pictures, committing 2 visual errors, 4 phonological errors and 11 semantic errors. In the repetition task, he correctly repeated 13/15 natural nouns, 14/15 objects, 13/15 function words, 14/15 abstract nouns, and 5/15 nonwords. In the oral lexical decision task, he performed 133/144. In the task of reading aloud words and nonwords, he correctly read 8/15 natural nouns, 4/15 concrete objects, 1/15 function words, 1/15 abstract nouns and 0/15 nonwords, thus showing concreteness, grammatical class and lexicality effects. In the task of reading aloud of words with unpredictable stress position, he correctly read 18/40 words, with no stress errors (see Fig. 3).

In the writing task, he correctly spelled 6/80 regular words with complete one-sound-to-one-letter correspondence, 5/15 regular words with syllabic conversion rules, 4/55 words with unpredictable transcription, 0/8 loan words, 4/25 nonwords. The analysis of attentional and spatial functions revealed severe unilateral neglect.

DISCUSSION

In the present work we tested, by means of several behavioural tasks, patient E.C., who suffered from CA after right cerebrovascu-

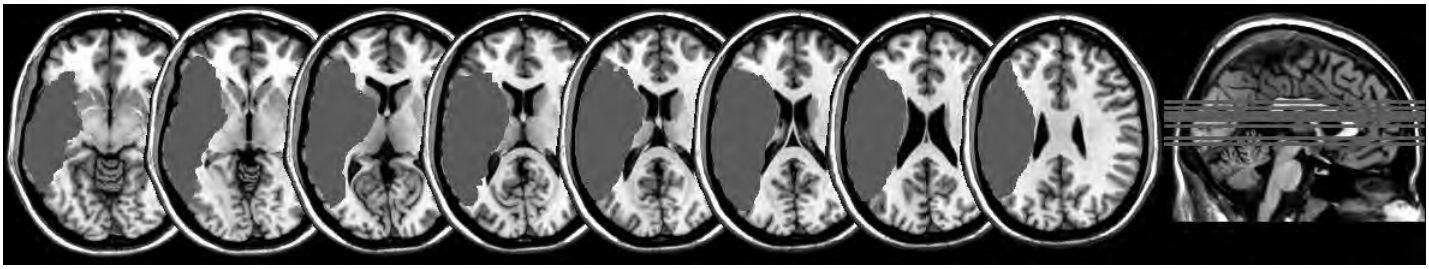


Figure 1.—Axial view of E.C.'s lesion.

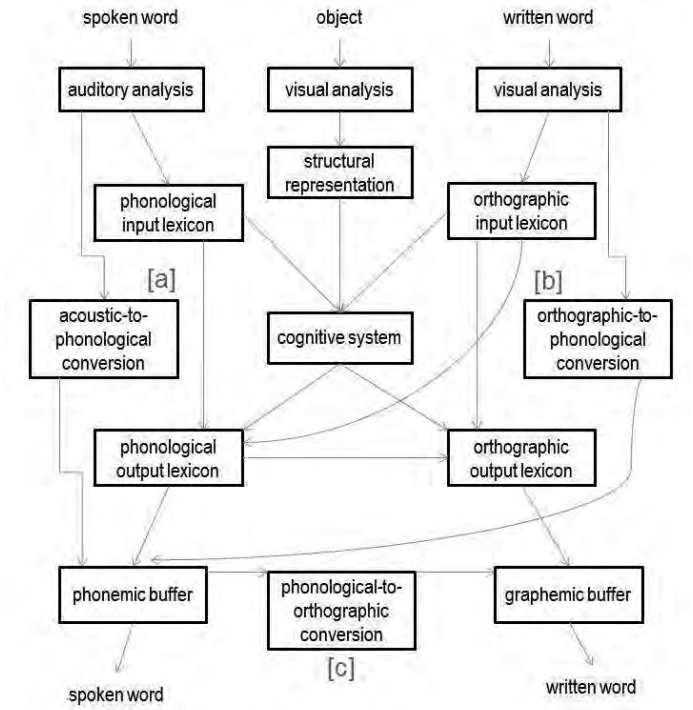
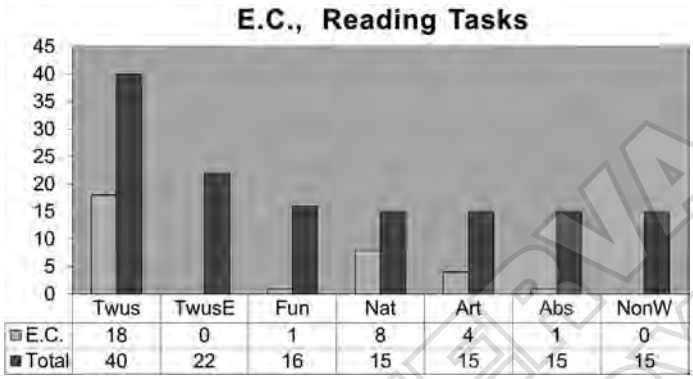


Figure 2.—Information-processing model of word naming, confrontation naming and writing (Patterson, 1986, adapted in Luzzatti *et al*., 1998).



	Twus	TwusE	Fun	Nat	Art	Abs	NonW
E.C.	18	0	1	8	4	1	0
Total	40	22	16	15	15	15	15

Figure 3.—Performance of patient E.C. in the reading tasks. Twus = Reading aloud of words with unpredictable stress position; TwusE = stress errors; Fun = Function words, Nat = natural nouns; Art = Artificial objects, Abs = Abstract nouns, NonW= Nonwords.

lar disease. We have interpreted the results of the neuropsychological assessment of the language functions (oral and written) on the basis of the dual route model (e. g., Patterson, 1986). The lexicality effect in the repetition task reveals a damage to the acoustic-to-phonologic conversion procedures ([a] in Fig. 2), whereas the route from the phonological input lexicon to the phonemic buffer is intact. The reading tasks revealed the presence of phonological dyslexia (i. e., damage to the orthographic-to-phonological conversion route, [b] in Fig. 2), whereas the severe damage in writing both words and nonwords can be accounted for assuming a damage to the phonological-to-orthographic conversion abilities ([c] in Fig. 2). The model postulates the existence of a lexical route from the phonological input lexicon to the orthographic output lexicon to write words, but the same route cannot provide for writing nonwords, that can only be spelled through the nonlexical route. Hence, we hypothesize that damage to the phonological-to-orthographic conversion procedure may explain the damage in writing both words and nonwords. In brief, we assert that the residual reading and writing skills in patient E.C. can be accounted for assuming damage to all the three subword-level conversion procedures described in the model.

CONCLUSIONS

Although reported only in few cases, CA represents an important syndrome in order to study the representation of language in the RH in cases of atypical cerebral dominance. At the actual state of the art, it is an open question whether, in case of atypical cerebral dominance, the language processing in the RH just mirrors or not that of the left hemisphere (i. e., in case of typical cerebral dominance). The performance in oral and written language of patient E.C., described in the present study, can be effectively interpreted in the light of the dual route model. In fact, the three sub-word-level conversion procedures can be considered damaged. In particular, as far as reading and writing skills are concerned, this indicates the presence of both phonological dyslexia and phonological dysgraphia. Finally, this patient showed, in reading tasks, two effects that are typically observed also in left-hemisphere brain damaged aphasic patients, that are the concreteness and grammatical class effects.

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Gruppi di Neuropsicomotricità dell'età evolutiva in corso di riabilitazione individuale: un'esperienza di intervento integrato presso la U.I.L.D.M. Sezione Laziale

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Presentiamo lo studio sull'integrazione dell'intervento riabilitativo individuale con la terapia di gruppo, in bambini di età inferiore ai 10 anni e con diagnosi multisistemiche, seguiti presso il nostro Centro riabilitativo da almeno 2 anni.

Obiettivo del nostro studio è l'integrazione della terapia individuale (non interrotta) con quella neuropsicomotoria di gruppo con il fine di poter sviluppare competenze relazionali, iniziativa e scambio comunicativo, comportamenti sociali, organizzazione spazio-temporale, abilità imitative, motorio-prassiche e di linguaggio espressivo.

Lavorando da diversi anni nel settore riabilitativo pediatrico, abbiamo avuto modo di riflettere sulla valenza della terapia individuale come strumento di integrazione nei contesti di vita quotidiana, al fine di migliorarne la qualità e rendere i bambini "capaci" di generalizzare gli apprendimenti. Spesso la generalizzazione degli apprendimenti non garantisce un passaggio qualitativo in tutti i contesti di vita poiché tutti i bambini da noi seguiti presentano diversità relazionali e comportamentali ma comunque problematiche, che influenzano la vita sociale.

Da qui nasce la prima ipotesi: in un setting strutturato e in un ambiente protetto, la relazione con il terapista in un rapporto 1:1, (necessario come punto di partenza nel lavoro terapeutico) garantisce la possibilità, per il bambino, di sperimentare la relazione in un contesto non protetto e alla pari con i coetanei?

Una seconda riflessione riguarda la durata media dei nostri progetti riabilitativi (spesso pluriennale), giustificata dalla complessità del quadro patologico, aggravato da disabilità multisistemiche (sensoriali, motorie, cognitive, linguistico-comunicative). Con il passare del tempo la terapia individuale può andare incontro ad una diminuzione dell'incisività relazionale iniziale nell'interazione terapista-paziente e quindi ad un calo della motivazione nell'apprendimento.

È ipotizzabile che la dinamica di gruppo possa riaccendere la motivazione, che rappresenta il motore importante del percorso riabilitativo?

Figure 1.—Agenda visiva.

Consideriamo una terza e ultima ipotesi che riguarda lo sviluppo cognitivo: il gruppo può essere un terreno fertile per aiutare i bambini ad apprendere, tramite l'imitazione, quelle competenze che con difficoltà vengono acquisite nella terapia individuale?

Le dinamiche relazionali all'interno del gruppo possono offrire la possibilità di generalizzare gli apprendimenti in contesti di vita sociale non protetti?

MATERIALI E METODI

La necessità di far fronte alle ipotesi formulate, ci ha indotto a pensare ad un progetto che integrasse nell'intervento riabilitativo gli obiettivi riguardanti le competenze relazionali, motivazionali e cognitive.

Il nostro studio, durato 10 mesi, è iniziato a settembre 2011 e si è concluso a giugno 2012 suddividendosi in tre fasi e con le seguenti modalità (Tabella 1)

Per la quasi totalità degli incontri, sono state effettuate videoriprese di momenti reputati più significativi per l'osservazione dei comportamenti durante la seduta; l'analisi dei video ha reso possibile formulare nuove proposte di lavoro.

Nelle prime restituzioni i bambini hanno mostrato e offerto il lavoro svolto. I video presentati hanno informato e chiarito la strutturazione della seduta e il significato degli strumenti tecnici che sono stati proposti ed utilizzati.

Nelle ultime restituzioni i video hanno dato la chiara idea del percorso svolto dal gruppo e in particolare gli obiettivi raggiunti da ogni singolo bambino. Inoltre è stato proposto ai genitori, tramite attività condivise, di ripercorrere il "viaggio emozionale" nella comprensione dei propri stati emotivi e nella sintonizzazione con le emozioni provate dai propri figli nei medesimi vissuti.

Tabella I.—*Progetto.*

Fase iniziale	– Selezione della popolazione e costituzione di 2 gruppi (A e B)
	– Presentazione del progetto e degli obiettivi ai NPI e genitori
Fase intermedia	– Elaborazione dei primi risultati e restituzione ai NPI e genitori
Fase finale	– Elaborazione degli obiettivi raggiunti per il gruppo e per i componenti
	– Restituzione conclusiva ai NPI e genitori
Progetto	
– durata totale	– 10 mesi
– frequenza	– 1 seduta e 1 programmazione
	– Settimanale
– conduzione	– 2 neuropsicomotriciste dell'età evolutiva

La popolazione è stata scelta tra bambini che da tempo svolgevano trattamenti individuali e nonostante le abilità cognitive apprese, presentavano comunque comuni cadute nella generalizzazione degli apprendimenti e nelle abilità sociali e relazionali. Al fine di offrire modelli comportamentali e stili di interazione differenti, arricchenti e complementari, sono stati selezionati pazienti con diagnosi eterogenee. Siamo giunti alla formulazione di due gruppi: gruppo A (5 bambini di età compresa tra 5,8 e 7,7 anni e con diagnosi di DGS (1), PCI (2), RM (2)); gruppo B (5 bambini di età compresa tra 6,2 e 8,8 anni e con diagnosi di DGS (3) e RM (2)).

Caratteristica principale del trattamento è la strutturazione fissa di alcuni momenti dell'incontro (*routine*) allo scopo di "insegnare" i tempi attraverso la sperimentazione stessa del tempo. Abbiamo utilizzato l'agenda visiva (1) per rendere chiara e comprensibile la successione degli eventi all'interno della seduta: l'informazione è quindi concreta, visibile e permanente nello spazio.

I momenti principali che hanno caratterizzato l'incontro sono stati:

1. "Accoglienza": è il momento iniziale in cui ci si ritrova e si fa gruppo ed è rappresentata dalla danza iniziale (un'espressione del sé e delle emozioni che la musica e la condivisione con gli altri suscitano, si stimola anche la coordinazione dinamica, la conoscenza del proprio corpo e i movimenti in sequenza) e dal "telo magico" (elemento che fa "apparire" il bambino permettendogli di entrare nel gruppo; si prende consapevolezza di se stessi, si riconosce l'altro come parte del gruppo, si gioca sulla propria identità).
2. "Palla parlante": è il secondo momento dell'incontro in cui ognuno esprime il proprio stato d'animo, le proprie emozioni (i bambini vengono aiutati dalle immagini che rappresentano le varie emozioni e sono sollecitati a ragionare ed esprimersi sul perché provino un dato sentimento).
3. "Attività": rappresenta vari lavori di ordine prassico e di integrazione visuo-motoria, e simbolico rappresentativo
4. "Gioco": si apprendono le regole, si comprendono i turni, si propone la sfida, si gestiscono le emozioni, si crea il contatto tra i bambini.
5. "Merenda": crea condivisione perché si svolge nel piacere di condividere qualcosa da mangiare, si aspetta il proprio turno grazie all'aiuto di una canzone, i bambini si sostituiscono all'adulto nella divisione del cibo.
6. "Saluto": È la parte finale dell'incontro, il gruppo si scioglie e ci si separa l'uno dall'altro gradualmente grazie ad una canzone; c'è sempre l'abbraccio finale in cerchio per lasciare un'impronta "fisica" prima della separazione.

Sono stati utilizzati, oltre all'agenda visiva, altri strumenti ad immagine come la Task Analysis, "micro agende"in cui un compito specifico viene scomposto in vari passaggi fino ad arrivare al suo completamento.

Attraverso gli strumenti musicali abbiamo supportato i bambini nel ritmo corporeo, mentre il materiale dei travestimenti è stato utile per l'interpretazione dei ruoli durante le drammatizzazioni.

RISULTATI

In entrambi i gruppi sono emerse nuove capacità o miglioramenti relativi alle varie aree dello sviluppo (Tabella 2).

Il lavoro in gruppo ha permesso ai pazienti di sperimentare la relazione in un contesto protetto con altri bambini di età differenti e con problematiche motorie, comunicativo-linguistiche e relazionali-sociali: questo "spazio" rappresenta un "modello" da poter esportare in contesti di vita sociale con i coetanei. Il gruppo quindi diventa la "palestra" che permette di vivere le relazioni veicolate dalle regole sociali.

La motivazione, che nasce dall'eterogeneità dei componenti del gruppo e quindi dai diversi contributi offerti in termini di competenze, è stata fortemente sollecitata tanto da dare risultati evidenti sia nell'acquisizione degli apprendimenti sia nella loro generalizzazione.

L'osservazione e l'imitazione dei "comportamenti" altrui, ha dato un importante imput alla crescita cognitiva dei bambini, traghettandoli verso un pensiero maggiormente astratto, collocandoli in uno "spazio-tempo" e aumentando l'iniziativa.

DISCUSSIONE

Il gruppo è un "piccolo-mondo" di relazioni e reciproci confronti, impraticabile per chi ha difficoltà relazionali, comportamentali, linguistico-comunicative e motorie. I pazienti del nostro studio hanno diagnosi multisistemiche, seguono interventi individuali sperimentando così relazioni privilegiate con il proprio Terapista. Incontrano difficoltà di inserimento sociale nel gioco di gruppo, di rispetto dei tempi di attesa e dei turni, di relazione e di comunicazione fra pari, di percezione ed espressione delle emozioni.

La proposta di integrare l'intervento riabilitativo individuale, necessario e duraturo, con quello di gruppo, offre un'ulteriore possibilità di sperimentare le relazioni sociali, percepire e poter modificare i comportamenti sociali, sviluppando le proprie risorse comunicative verbali e non verbali.

L'esperienza delle restituzioni ci ha indotto ad ipotizzare un cammino parallelo in gruppo per i genitori, necessario per interiorizzare e mettere in discussione le esperienze e i vissuti soprattutto emotivi relativi alla genitorialità.

La durata della terapia (60') sembrerebbe un tempo troppo limitato per tutte le proposte di lavoro, considerando anche il numero dei componenti e i tempi di ognuno nell'espressione di se stesso.

Il gruppo aiuta a gestire comportamenti inappropriati diventando addirittura più efficace dell'intervento dell'adulto, poiché esistono meccanismi di feed-back veicolati dalle interazioni dei componenti.

Abbiamo investito molto sull'autonomia all'interno della programmazione ideo-esecutiva delle attività prassiche, ma abbiamo dovuto sostenere coloro che presentavano difficoltà negli schemi d'azione. Da qui nasce l'esigenza di proporre percorsi di lavoro differenziati e personalizzati all'interno di un'attività condivisa.

Tabella II.—*Risultati del lavoro.*

Aree di Sviluppo	Gruppo A	Gruppo B
Relazionali	– Consapevolezza di essere in "gruppo" – Ridotta mediazione dell'adulto nell'interazione – Autonomia nella socializzazione – Miglioramenti di "comportamenti problema" in 2 bambini	– Riduzione dei rapporti privilegiati nell'interazione – Maggiori "aperture relazionali" – Miglioramenti dei comportamenti problema in 1 bambino – Miglioramento delle capacità di adattamento in 2 bambini
Emotivo-affettive	– Comprensione ed espressione dei propri stati emotivi – Sviluppo di relazioni affettive importanti	– Comprensione ed espressione degli stati emotivi propri ed altrui – Sviluppo di relazioni affettive importanti
Comunicativo-Linguistiche Cognitive	– Maggiore intenzionalità comunicativa – Comparsa del linguaggio verbale in 1 bambino – Iniziativa e partecipazione alle attività – Acquisizione sequenza motorio prassica – Miglioramento abilità imitative	– Iniziativa nella comunicazione verbale – Acquisizione della competenza narrativa e dei nessi logici – Organizzazione sequenziale e temporale – Miglioramento dell'organizzazione sequenziale dei movimenti su base imitativa – Sperimentazione e acquisizione del gioco di regole

Le facilitazioni visive sono state immediatamente comprese ed interiorizzate dando la possibilità ai bambini di anticipare e predire le attività, minimizzare i problemi legati ai disturbi della memoria e dell'attenzione e abbassare i livelli di ansia, stabilire le regole e le linee guida del comportamento, compensare i problemi di linguaggio ricettivo, supportare l'apprendimento delle abilità comunicative espressive e rendere la comunicazione più efficace, favorire l'indipendenza, aumentare l'autostima.

Studi in letteratura confermano la valenza del lavoro di gruppo, un "microcosmo" all'interno del quale il bambino sperimenta la relazione e interiorizza quelle regole sociali che sono alla base dell'integrazione nei contesti di vita quotidiana.

Viene confermata l'idea che "il gruppo" diventi uno strumento attraverso il quale il bambino possa crescere in maniera globale e armonica in tutte le competenze dello sviluppo.

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Centre of Excellence in Health Promotion and Rehabilitation: an interdisciplinary co-work in balneology in Estonia

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Balneotherapy is one of the oldest forms of therapies. The mud therapy has been used for almost 200 years in Estonia. Estonia is rich in ecologically pure sea and lake sediments and well-humified peat that may have been used in human therapy. Therapeutic mud contains different ions and specific bacteria, which partake in the formation of mud and hydrogen sulphide (1). However, the healing effect is related to the content of bioactive compounds and mostly to the humic substances and lipids (2,3). Therapeutic mud affects the organism as a thermal, mechanic and chemical irritant and has an effect of biomodulation for the whole organism: the nervous and cardiovascular systems, the skin, blood composition and metabolic processes (1). Since 1960-s in Estonia there is lot of clinical trials, which are analysed the effect of mud therapy and the effect of bioactive compounds from the mud. Most of those trials reported the positive findings. However, if we wanted to compare those trials to the results of last decade trials in that area, we found that these earlier studies have poor methodological quality: the absence of an adequate statistical analysis and the absence of most essential outcome measures (pain, self-assessed function and quality of life). Mud therapy mainly offered in medical spas and the main spa therapy course occurs over 2-3 weeks. During the last decades, length of spa therapy time in Estonia has decreased mainly due to changes in the economic situation and is now commonly 6-7 days (4). This situation sets new challenges in the mud therapy. There is a need to gather all the existing knowledge on therapeutic mud and to analyse it. It is also important to work out newest technologies in mud treatment and to investigate in the development of new therapeutic mud products and services in the closed co-work with high-level clinical physical and rehabilitation medicine (PRM) facilities.

MATERIALS AND METHODS

The project enforces interdisciplinary co-work in balneology, involving PRM doctors, occupational physicians, biotechnology engineers, chemists, SPA managers etc. and cooperation between the representatives of PRM clinics, research and development institutions, local authorities and businesses in the field of balneology, especially mud therapy. To get the overview of different studies in the field of mud therapy in Estonia, all the materials was gathered and analysed.

RESULTS

Centre of Excellence in Health Promotion and Rehabilitation (CE) was established in Estonia, in Haapsalu in 2012. There are 15 partners involved in the project activities: Tallinn University, University of Tartu, Haapsalu Neurological Rehabilitation Centre, Tartu University Hospital, Haapsalu City, Estonian Spa Association, etc. In the focus of therapeutic mud, the CE will be a centre of research, development and information mediation as well as an organization in evaluating the condition of therapeutic mud in the world, related research and rational utilization of therapeutic mud.

In sixties of 20th century, different scientists studied the effect of mud therapy. All these works deal with the effect of using Haapsalu sea mud and Humisol. The first scientific work in the field of healing mud was studying therapeutic effect of preparation Humisol. In 1957 scientist, Evald Keel separated from Haapsalu sea mud the fraction of humic acid. Humisol is 0.01% solution of humic acid in 0.9% NaCl (sodium chloride) solution. The effect of Humisol was studied experimentally and clinically. Humisol effect is resembled to mud therapy effect. Humisol has an effect on immunity and metabolism and is antimutagenic and antitoxic (5,6). In 1965, Humisol was certified as preparation for injection. Until beginning of 1990's Humisol was manufactured by Tallinn Pharmaceutical Plant. Deficiency of the production of Humisol was that it lacked fixed composition and single-valued therapeutic effect. There were also problems with product shelf life.

In 20th century spa therapy course with mud therapy lasted on the average 3-4 weeks and included 12 mud procedures, 11 baths or showers, gymnastics and massage. Mud therapy was used in the treatment of peripheral nervous system and musculoskeletal system diseases. Different studies showed how this treatment influences the heat regulation, immune and endocrine system, metabolism of connective tissue and other processes. Lot of studies are in manuscripts and results are mostly published in local conference thesis.

In 1975, three different healing muds (Haapsalu, Suurlahe and Värska mud) from sea and lake were studied chemically and therapeutically. Spa therapy course with those muds have good influence on different rheumatic and peripheral nervous system diseases. Therapy effect depends on the composition of the mud. In 1993, the sediment from Ermistu Lake was studied. Therapeutic effect is almost the same as with Haapsalu mud (7) and in 1995 Ermistu mud was certified as a curative mud. At the same time it was investigated how partially removing of water from Haapsalu mud influences the mud therapeutic effect (8).

Several bioactive organic compounds (humic substances) are an important part of sediments. Experimental works showed that these compounds are not toxic, mutagenic, and carcinogenic. They have anti-inflammatory effect. Complex of humic substances from two different curative muds (Haapsalu, Ermistu) were separated and studied therapeutic effect of those complexes in electropho-

retic and ultrasound procedures. Both complexes are useful in the case of osteoarthritis or spondylosis (2).

Estonia is rich in high-humified peat layers and in the last decade was studied their chemical and therapeutic properties (3).

All these studies are done in different PRM facilities and the results on some investigations in the field on mud therapy is published some decades ago and is not well known in nowadays.

CONCLUSIONS

Balneology has significant overlap with the PRM, as it uses physical factors for therapy and applies comprehensive multi-modal programmes to patients with chronic health conditions aiming at an improvement of functioning and quality of life. CE focus on two more specific areas:

— research on therapeutic mud, evaluation of its impact, development of know-how based entrepreneurship;

— evaluation of population´s mobility and physical activity, its development (prevention and rehabilitation), counselling, implementation of know-how in entrepreneurship.

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Aphasia after acute stroke: incidence, characteristics and therapy

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Aphasia is defined as a language disorder due to a lesion on the brain areas controlling its production and comprehension (1).

The incidence of aphasia varies because the studies were conducted using different diagnostic criteria, different classification and evaluation in different developmental stages of the disorder. It has been reported that 40 to 60/100,000 inhabitants suffer aphasia after a first ischemic stroke (2) (3).

Studies on the incidence of aphasia in Spain, its clinical and demographic characteristics and the facility or absence of it to Phoniatrics and Speech Therapy Units access have not been found.

This paper focuses on the following objectives:

— To know the incidence of aphasia in patients admitted to Complexo Hospitalario Universitario de A Coruña (CHUAC) with a stroke in 2007.

— To describe the clinical and demographic characteristics of patients suffering a stroke with aphasia.

— To analyze the treatment received in our Phoniatrics Unit.

MATERIALS AND METHODS

We did a retrospective observational study at the CHUAC, which is the Public Health System hospital of reference for a population of 543,598 inhabitants in the Northwest of Spain. The hospital's central file has been used as a source of information through the minimum set of discharge data, discharge summaries and clinical histories.

Inclusive criteria: patients diagnosed with a stroke and admitted to CHUAC in 2007. Age over 17.

Exclusion criteria: brain pathology with no vascular etiology.

The variables analyzed were epidemiological (age, sex, origin, residence) and clinical (type of stroke, localization, risk factors and associated diseases, presence of aphasia). The following variables were also studied in aphasic patients: type of aphasia on admission (classified as motor, sensory, mixed, global and other), motor impairment and referral to the Phoniatrics Unit. Besides, in cases referred to the Phoniatrics Unit the results obtained after applying the Boston Test for Diagnosis of Aphasia were analyzed, and the clinical course and speech therapy treatment received was also studied.

Based on the available literature, we computed the population sample size to an estimated incidence of aphasia 25% with confidence interval 95%.

A descriptive analysis of all the variables collected was performed. Quantitative variables were expressed as the mean, standard deviation, median and range. Percentages and confidence intervals at 95% for qualitative variables were calculated.

Student's test and the test by Mann-Whitney were applied in order to study the quantitative variables. Fisher's exact test was used to analyze the association with qualitative variables. The statistical analysis was performed using the SPSS 18.0 package for Windows, observing significant values of $p<0.05$.

RESULTS

In 2007, 974 patients were admitted to CHUAC with a stroke diagnosed criteria, a random sample of 213 patients was drawn from them, being the estimation of confidence interval 95%.

CLINICAL AND DEMOGRAPHIC CHARACTERISTICS IN PATIENTS WITH APHASIA

Fifty-one of 213 patients were diagnosed with aphasia at admission, being thus its incidence 23.9% (CI 95%).

The most common type of aphasia at admission was motor aphasia (45.7%) followed by mixed aphasia (34.0%) and sensorial aphasia (11.0%).

Only 23.5% of aphasic patients were submitted to the Phoniatrics Unit. Most of them (50%) were derived by the Rehabilitation Service; 33% by the Neurology Service and 17% by the Internal Medicine Service.

At the phoniatric examination through the Boston test, Broca's aphasia was the most common type (42%), followed by transcortical motor aphasia (25%) and anomic aphasia (17%). Wernicke's aphasia was found in 8% of cases, same as global aphasia.

Almost all of these patients (92%) received speech therapy, which was extended during 5 moths average (SD 2.7). Favorable outcome was achieved in 75% of them.

CHARACTERISTICS OF PATIENTS WITH A STROKE VERSUS PATIENTS WITH A STROKE AND APHASIA

There were no statistically significant differences in age or sex in both groups. Significant differences in the proportion of ischemic and hemorrhagic stroke among patients with aphasia and patients without aphasia were not found. (Table 1)

Regarding risk factors and associated comorbidity, there was no statistically significant association between a history of heart disease, arteriovenous malformation, diabetes and hypertension, and the onset of aphasia after acute stroke. Nevertheless, statistically

Table I

	Aphasia	Non aphasia	p
Mean age (years)	72	72,2	0.016
Male (%)	19,8	80,2	0.199
Female (%)	28,0	72	0.199
Heart disease (%)	24,0	23,8	0.01
Diabetes (%)	26,1	23,4	0.148
Hypertension (%)	23,8	24,1	0.956
Atrial fibrillation (%)	34,8	21	0.043

significant association was found between the previous history of atrial fibrillation and the result of aphasia after an acute stroke.

DISCUSSION

The incidence of aphasia in stroke survivors found in this study (23,9%) is within the range reported in literature (17-38%). The diagnosis of aphasia was performed during hospitalization, at an early stage of stroke. Pedersen *et al.*l. (4) reported that the incidence of aphasia on admission was 38%, persisting at discharge only in 18% of survivors.

There is consensus in that aphasia is more common in cardio embolic strokes in relation to heart disease, particularly atrial fibrillation. It is believed that this is due to the increased risk of cardio embolic stroke in atrial fibrillation for cardio embolic strokes, compared to other types, most often located in the language centers area. Our study has confirmed the significant association between a history of atrial fibrillation and the presence of aphasia after stroke.

Only 23,5% of patients with aphasia who survived were submitted to the Phoniatrics Unit. This percentage is far from that shown in the study of Ontario (3), in which only 35% of patients with aphasia were not seen by a speech pathology specialist. Pedersen *et al.*l. (4) referred a spontaneously full recovery in 30% of patients and in the speech therapy study 28% of all patients were treated. Spontaneous recovery can be an influential factor on the number of patients referred to Pathology for an assessment. Another factor could be the presence of other medical complications. Additionally, most of the patients were derived by the Rehabilitation or Neurology Services. This fact could be motivated by a greater awareness from professionals of these Services according to the current recommendations for the treatment of aphasia.

CONCLUSIONS

The incidence of aphasia found in our population is comparable to the one found in other countries, but the rate of referral to the Phoniatrics Unit is lower than other reports. Statistical association does exist between the previous history of atrial fibrillation and the existence of aphasia after suffering a stroke episode. The incidence of aphasia in Spain and its characteristics must be known to plan the Language Rehabilitation Services. According to previous reports, a language assessment and therapy should be considered for all patients with aphasia in the acute phase of stroke.

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Distribution of risk factors and gender in patients that are referred to a rehabilitation facility in subacute phase of stroke from Serbia

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Over the years stroke has a dominant place in the structure of neurological morbidity and represent a major global health burden (1). Because of the severity of this problem indentifying stroke triggers may minimize stroke incidence.

There are numerous risk factors that are associated with the stroke etiopatogenesis. In additional to natural risk factors (heredity, gender, age) and bad habits (eating, obesity, smoking etc.) some diseases such as hypertension, dyslipidemia and diabetes belongs to risk factors and have strong influence on development of stroke (2). Among them different factors correlate to the different degree on both onset on the development of the stroke, rehabilitation process and finally on the treatment outcome. The relationship between blood pressure and stroke has been widely demonstrated but the role of dyslipidemia as a modifiable risk factor for stroke has been less clear and controversial for long time (3). Nevertheless, current guidelines recommend lipid lowering therapies as a preventive measure to reduce stroke risk. Diabetes as an associated risk factor correlates with stroke. High level of blood glucose and its duration for years associate with more severe strokes and long outcome (3). In the last years evidence that the gender has a great impact on the distribution of stroke risk factor are growing. It has been proved that females during the period prior to menopause are protected with higher levels of high density lipoproteins (HDL), which are known to protect blood vessels against atherosclerosis (4).

Therefore the aim of our study was to evaluate distribution of risk factors and gender in patients that are referred to a rehabilitation facility in subacute phase of stroke from Serbia.

MATERIAL AND METHODS

We have included 120 patients that suffered stroke and were referred to rehabilitation facility in subacute phase. The criteria for inclusion were previously diagnosed either ischemic or haemorrhagic cerebrovascular insult (CVI). Exclusion criteria were: acute and chronic CVIs. The risk factors that were evaluated included: hypertension, hyperlipidemia and diabetes mellitus type II (DM-II). We have additionally evaluated distribution of risk factors frequencies: group without any risk factor, group with I, II and III risk factors. The evaluated population was divided due to the gender on: male and female gender. Prior inclusion in the study all participants were informed about the study protocol and informed consent was obtained. The study was conducted in accordance with Declaration of Helsinki and followed principles of good clinical practice.

The results were presented as whole numbers and percents. The comparisons between evaluated parameters were done by chi squared test. The statistical significance was set on $p<0.05$.

RESULTS

There were 70 male and 50 female patients. The most frequent risk factor was hypertension both in males (94.3%) and females (88.0%). Distribution of hyperlipidemia in males was 62.9% and females 52.0%, while DM-II was presented with lowest frequency both in males (31.4%) and females (34.0%) (Table I).

There were 8.6% of males and 8.0% of females without any of evaluated risk factors, there were 35.7% males and 22.0% females with I risk factor, 37.1% males and 50.0% females with II risk factors and 18.6% males and 20.0% females with III risk factors (Table II). We found non significant difference in both distribution and frequencies of evaluated risk factors between genders ($p>0.05$).

DISCUSSION

Previous reports pointed out that different factors among different genders predispose the one to the stroke more frequently (4,5). Possible explanations are due to the hormonal protection and overall lifestyle of individue. As it was expected, we have found that hypertension is most frequent risk factor (more in males), while DM type II is represented only in a less than a third of proportion (more in females). Contraversial opinions of dyslipidemia influence on a eventual onset of stroke are previously reported (6). Our results are in correlation with such findings, stating that almost every second female presented with hyperlipidemia, while less than two thirds of males had such state.

Table I.—*Distribution of evaluated risk factors.*

Parameters	Hypertension	Hyperlipidemia	DM - II	Total
Total	110 (91.7)	70 (58.3)	39 (32.5)	120 (100)
Male gender	66 (94.3)	44 (64.9)	22 (31.4)	70 (100)
Female gender	44 (88.0)	26 (52.0)	17 (34.0)	50 (100)
χ^2 (p values)	>0.05	>0.05	>0.05	

Table II.—*Frequencies of evaluated risk factors (comorbidity).*

Risk factors	None	1	2	3	Total
Total	10 (8.3)	36 (30.0)	51 (42.5)	23 (19.2)	120 (100)
Male gender	6 (8.6)	25 (35.7)	26 (37.1)	13 (18.6)	70 (100)
Female gender	4 (8.0)	11 (22.0)	25 (50.0)	10 (20.0)	50 (100)
χ^2 (p values)	>0.05	>0.05	>0.05	>0.05	

Our study have pointed out that most frequently female patients with stroke had 2 risk factors although without statistical significance, while presence of one risk factor was more frequent in males even though without statistical significance (Table II; p>0.05). These findings may contribute to the possible assumption that females are to the certain degree more protected by certain risk factors (eg. positive lipid profile) and therefore are more resistible to the patholphysiological processes that are responsible for the development of the stroke.

The study findings stress out that due to the severity of above mention pathology indentifying stroke triggers in both genders may minimize stroke incidence.

CONCLUSIONS

We have shown that females who suffered stroke had more risk factors than males, while non of these risk factors has significant difference in the proportion between genders. Further, the most frequent risk factor is shown to be hypertension.

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A 2-month-old girl with bilateral perisylvian syndrome and arthrogryposis multiplex

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The term Congenital Bilateral Perisylvian Syndrome describes a structural malformation of the brain in which the underlying anomaly is Polymicrogyria, a malformation of the outer layer of the cerebral cortex. Polymicrogyria may have a focal or regional distribution or involve the whole cortical mantle. There are consequently wide spectrums of clinical manifestations, which include children with severe encephalopathies and intractable epilepsy or normal individuals with selective impairment of cognitive functions in whom the mild cortical abnormality is only detected on pathological brain study.

MATERIALS AND METHODS

This is a 2-month-old girl, gipsy, preterm, with a clinical onset of apnea, bradycardia and she was unable to swallow. Due to the situation of the patient, she was admitted in Intensive Care Unit. Due to the existence of arthrogryposis multiplex and respiratory distress she was valued for our Pediatric Rehabilitation Unit. On examination the child showed unusual facies, retrognathia, hypotonia, flexion contractures of both hands, bilateral equinovarus and delayed milestones. The patient was on antiepileptic because of the EEG showed focal activity in the form of sharp waves of temporal and rolandic region of the right cerebral hemisphere. The esophagogastroduodenal study showed swallowing incoordination and because of that she required parenteral nutrition. MRI of brain revealed a congenital abnormality in the neuronal organization of the cortical mantle. It showed perisylvian syndrome.

RESULTS

The treatment for this patient included those aspects for the rehabilitation of oropharyngoglossal dysfunction and motor deficits in addition to the antiepileptic therapy. We decided to include the patient in physiotherapy respiratory to improve handling of secretions and her respiratory capacity improved considerably. Besides she was treated with passive mobilization techniques. We decided to put plaster splints on her lower extremities with periodic changes to treat equinovarus and her deformities have not progressed any more. The patient died at twelve weeks of income for cardiac arrest.

DISCUSSION

Polymicrogyria refers to abnormal appearance of the cortex with multiple abnormally small convolutions and too few sulci. It is basically an organization anomaly in which the neurons reach their final destination in the cortex but are distributed abnormally. Gross assessment of the thickness of the cortical surface is due to fusion of the adjacent miniature gyri piled upon one another (1).

This syndrome has been associated with congenital cytomegalovirus infection (2). Aicardi syndrome or can be sporadic. The anomaly usually occurs as a result of post-migration insult during fifth or sixth months of pregnancy.

CONCLUSIONS

Syndromes of Bilateral Symmetrical Polymicrogyria have been classified on the basis of their predominant distribution. The presentation of the patient depends on the distribution. Bilateral Frontal Polymicrogyria typically results in developmental delay, mild spastic quadriparesis, variably impaired language development and epilepsy. Bilateral Parasagittal parieto-occipital polymicrogyria is associated with seizures and mild mental retardation; however neurological deficits are often not present. The oromotor dysfunction associated with Bilateral Perisylvian Polymicrogyria is lacking with Bifrontal Malformations. Essential criteria for diagnosis of this syndrome are oropharyngoglossal dysfunction, moderate to severe dysarthria and bilateral perisylvian malformations on imaging (3). Additional criteria (present in more than 85% of the cases) include delayed milestones, epilepsy, mental retardation and abnormal EEG. Other criteria for diagnosis are arthrogryposis multiplex, other limb malformations and infantile spasms. In our case the patient had all the features of essential criteria and also she presented arthrogrysposis multiplex, a clinical feature that is present in less than 50% of the cases.

Multiple hypotheses have been proposed to explain the presence of congenital joint contractures in some patients with polymicrogyria; these include an in utero vascular insult affecting both central and peripheral nervous systems, a common developmental mechanism of altered migration in both the brain and spinal cord, and a direct central effect of the brain malformation on fetal joint mobility (4).

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Functional Outcome of Inpatient Rehabilitation in Persons with Brain Tumours

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Many impairments and subsequent disabilities are associated with cancer. Among patients with disability from cancer, those with brain tumours (BTs) are a special challenge, given the potential for a combination of physical, cognitive, and communication deficits in addition to the psychological stress associated with the diagnosis of malignancy.[1] Several investigations suggested that patients with various types of BTs achieve good functional gains after inpatient rehabilitation.[2-8]

The aims of this study were (1) determine whether BTs patients achieve significant functional improvements through inpatient rehabilitation; and (2) compare outcomes with a group of patients with non-neoplastic brain lesions.

MATERIALS AND METHODS

We conducted a retrospective study including all patients with a diagnosis of brain tumour (BT) first admitted to the inpatient rehabilitation ward at Santo António Hospital in Oporto, from January 2003 to June 2012. Patients who did not complete their rehabilitation program were excluded from the sample.

Medical records were reviewed and collected: (1) demographic information; (2) tumour characteristics; (3) nature of impairments; (4) acute medical problems; (5) functional status at admission and discharge, length of stay (LOS) on the rehabilitation ward and discharge destination. Functional status was measured using the Functional Independence Measure (FIM), which measures disability in the areas of self-care, mobility, locomotion, sphincter control, communication, and social cognition. Each of 18 items is scored from 1 (dependent) to 7 (independent); we used total, motor and cognitive FIM categories. FIM change was the difference between discharge and admission FIM scores. FIM efficiency was the FIM change divided by the LOS in days.

We also selected patients with an admitting diagnosis of non-neoplastic brain lesions who completed inpatient rehabilitation on the same unit, matched to BTs patients by admission FIM score (± 5 FIM points), age (± 5 years) and gender.

Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences 17th version). We considered a *p value* less than 0.05 statistically significant. Wilcoxon test was used for comparison of admission and discharge FIM scores in BTs patients. Tumour and non-tumour groups were compared using Mann-Whitney U test.

RESULTS

Forty-two patients were admitted to the rehabilitation ward with a diagnosis of BT, but 7 were excluded since they did not have discharge FIM data, remaining 35 patients. Thirty-five patients with non-neoplastic brain lesions (62.9% with stroke and 37.1% with traumatic brain injury) were also included.

The mean age of BTs patients was 59.7 (SD11.5) years, 18 (51.4%) were women and 17 (48.6%) were man. Thirty-three patients (94.3%) were diagnosed with primary BT and 2(5.7%) had metastatic disease. Meningioma (45.7%) was the most frequent tumour type followed by astrocytoma (40%), ependymoma (8.6%) and metastatic dissemination (5.7%). Hemiparesis was the most frequent impairment: 18 patients (51.4%) had left and 9 (25.7%) had right hemiparesis. Tetraparesis was observed in 22.9% of the admissions.

Others impairments included cognitive deficits (48.6%), cranial nerve palsy (45.7%), aphasia (20%), dysarthria (8.6%), dysphagia (17.1%) and bladder/bowel dysfunction (25.7%).

Medical problems requiring ongoing management were frequently seen. Urinary tract infection (28.6%) was the most frequent, followed by seizure disorder (8.6%), respiratory infection (8.6%), deep vein thrombosis (5.7%), arterial hypertension (5.7%), diabetes mellitus (2.9%), surgical wound infection (2.9%), and keratitis (2.9%).

Patients with BTs achieved statistically significant improvements in all FIM scores from admission to discharge (Table I). No statistically significant differences were identified for total FIM change (p=0.609) and total FIM efficiency (p=0.061) between tumour and non-tumour groups. However, in patients with BTs the mean LOS in the rehabilitation ward was significantly longer than in patients with non-neoplastic lesions (p= 0.026) (Table II). Thirty (85.7%) patients with BTs were discharged home, 4 (11.4%) were

Table I.—*Functional Independence Measure scores for the group of brain tumours.*

	Admission (mean±SD)	Discharge (mean± SD)	FIM change (mean± SD)	*P* value
FIM total scores	76.77 (±24.40)	92.63 (±25.44)	15.86 (±11.15)	<0.001
FIM motor scores	48.34 (±18.55)	62.66 (±20.92)	14.32 (±10.15)	<0.001
FIM cognitive scores	28.43 (±8.25)	29.97 (±7.11)	1.54 (±2.48)	0.001

Table II.—*Outcomes for brain tumour (BT) group and non-tumour group.*

	BT group (n=35)	Non-tumour group (n=35)	*P* value
Total FIM change (mean±SD)	15.86 (±11.15)	20.17 (±17.90)	0.609
Inpatient rehabilitation length of stay (days) (mean±SD)	36.0 (±22.0)	26.9 (±19.8)	0.026
FIM efficiency (mean± SD)	0.59 (±0.53)	0.98 (±0.80)	0.061

discharged to continuing care unit and 1 (2.9%) was discharged to another hospital.

DISCUSSION

In our study, all FIM scores of BTs patients improved significantly from admission to discharge which was similar to findings of previous investigations.[2-8]This shows that BTs patients have functional impairments that can improve with inpatient rehabilitation interventions.

Also consistent with other studies,[3-5]our data indicate that BTs patients have functional gains comparable to those of patients with other causes of brain injury. Although patients with non-neoplastic brain lesions had greater total FIM change and total FIM efficiency these differences were not statistically significant.

Unlike other studies[3-5], we found that BTs patients had a longer LOS in the rehabilitation ward than those with non-neoplastic lesions, which may have been due to increased medical complications seen in the tumour group. Most of the BTs patients were home discharged and this finding is similar with those previously reported.[2-8] The high rates of discharge to community among those completing rehabilitation provide evidence of the utility of rehabilitation in returning BTs patients to the community.

This study has several limitations. The sample size was small, data are retrospective and were collected at a single site, which limits the generalization of the findings.

CONCLUSIONS

Patients with brain tumours have significant functional gains through inpatient rehabilitation and the majority are able to return home after discharge. These outcomes are comparable to those of patients with stroke or traumatic brain injury. Therefore, rehabilitation intervention in patients with brain tumours seems justified.

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Epidemiological profile of amputee in rehabilitation: a report of 86 cases

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The loss of a limb by any individual, especially in developing countries where the prosthetic services are poor often has profound economic, social and psychological effects on the patient and their family [1].

Amputations are usually the result of complications of diabetes, peripheral arterial disease, trauma, and malignant tumors; and are often complicated by infection [2,3]. The incidences of different pathologies leading to limb amputation have been reported to vary from one place to the other. In developed countries peripheral vascular disease ranks first as cause for amputation whereas trauma, infections, uncontrolled diabetes mellitus and malignancies are the leading cause for amputation in developing countries [4]. Most amputee patients in developed countries are older than 60 years of age, and 80-90 % of lower limb amputations are performed as a result of vascular problems [5, 6]. However in the developing world, the majority of amputees are young and the major cause of limb amputation varies from one hospital to another. This study was undertaken to determine the epidemiologic characteristics of amputations in the outpatient rehabilitation, and to describe our experiences and compare the findings with studies conducted in other parts of the world with a view to highlighting the variations in the pattern and indications for amputations.

Table I.—*Demographic data of amputees.*

	Number of patients	Percentage
Age group		
11-20	1	1,2
21-30	4	4,7
31-40	4	4,7
41-50	7	8,1
51-60	20	23,3
61-70	30	34,9
>70	20	23,3
Co-morbid conditions		
Diabetes	70	81.3
High blood pressure	15	17.5
Peripheral arteriopathy	4	4.5
Indications for amputation		
Complications of diabetes	69	80
Peripheral vascular disease	3	3.5
Trauma	12	14
Malignancy	2	2.5
Level of amputation		
Below knee amputation	75	87.2
Above knee amputation	9	10.4
Below elbow amputation	1	1.2
Above elbow amputation	1	1.2

MATERIALS AND METHODS

A retrospective study was conducted at the Physical and Rehabilitation Department and All patients of all age group and gender referred after limb amputation during 7 years (January 2006 - June 2012). Medical records were reviewed for basic patient demographics including age, gender, risk factors for peripheral vascular disease, diabetic status and co-morbid conditions, as well as indications for amputation. Rehabilitation potential was assessed by a trained physiotherapist with a special interest in amputees. Physiotherapy was commenced on appropriate patients whose wound had healed satisfactorily. Patients suitable for prosthesis were sent to a regional centre for appropriate measurements. The level of amputation was classified as below knee amputation (transtibial), above knee amputation (transfemoral), below elbow amputation and above elbow amputation. Statistical interpretation of the data was performed using statistical package for social sciences (Windows version 16.0; SPSS).

RESULTS

A total of 86 amputees patients were adressed during the study period. The patients were aged 19–82 years (mean 59 years). 71 patients (82.5 %) were males and females were 15 (17.5 %) with a male to female ratio of 4.7:1. The modal age group was 61–70 years (Table I).

Diabetes was present in 81.3% of the cases, high blood pressure in 17.5%, peripheral arteriopathy in 4.5%, myocardial infarction in 5.5%, stroke in 5.5% and dyslipidemia in 11.5 %(Table I).

Complication of diabetes was the main indication for the major limb amputations in 69 (80 %) patients followed by trauma in 12 (14 %) patients , vascular disease in 3 (3.5%) patients and tumor in 2 (2,5 %) respectively.

Trauma (mainly road traffic accidents) was most common indication for amputations in young adults (2nd to 3rd decades) whereas complications of diabetes and peripheral vascular diseases were the main indications in the 5th to 6th decades of age (Table II).

Lower limbs were involved in 82 (95.3 %) cases and upper limbs in 1 (1 .2 %) cases giving a lower limb to upper limb ratio of 82:1. There was bilateral limb amputation in 2 (2 .4%) cases. In the lower limb, the ratio of below knee amputation to above knee amputation was 8 .3:1. In the upper limb, the ratio of below elbow to above elbow was 1: 1. The major indications for upper limb amputations were trauma (100 %) while diabetic gangrene (79 ;1 %) and trauma (14 %) were the most common causes of amputation in lower limbs. The levels of amputation are given in (Table II).

The average number of sessions was 13. The prescription of pros-

Table II.—*Age group versus indications.*

Age group	Indications				
	Diabetic foot	Peripheral vascular diseases	Trauma	Malignancy	Total
11-20	-	-	1 (1.2%)	-	1(1 .2%)
21-30	-	-	3(3.6%)	1(1.2%)	4(4 .8%)
31-40	2(2.4%)	-	2(2.4%)	-	4(4 .8%)
41-50	4(4.6%)	-	2(2.4%)	1(1 .2%)	7(8.1)
51-60	18(20.7%)	2(2 .4%)	-	-	20(23%)
61-70	29(33,7%)	-	1(1.2%)	-	30(34.9%)
>70	16(18.6%)	1(1.2%)	3(3.4%)	-	20(23%)
Total	69(80%)	3(3.6%)	12(14%)	2(2,4%)	86(100%)

thesis was made in 68.5% of the cases. Local complications were muscular atrophy of the stump in 44 % of cases and skin complications in 41%. A phantom limb pain was observed in 50 % of cases.

DISCUSSION

Our findings align with international studies indicating that people undergoing amputations were more likely to be older, male and have diabetes or peripheral arterial disease [7]. The male preponderance among amputee in the present study agrees with the findings by other authors [8]. We could not find any reasons to explain for the male preponderance in this series.

The majority of our patients were in the 6th and 7th decades which is comparable with another study in Ghana which reported high peak age incidence in the 7th decade [9]. But in contrast with other studies [5,8] which reported even lower peak age incidence.

This age differences can be explained by variation in the cause and patterns of amputation which tend to vary between hospitals in the country and between countries.

Complications of diabetic foot ulcers were the most common indication for major limb amputation in our study, followed by trauma and peripheral vascular diseases. Similar trend was also reported in other series [5,9,10]. A recent Australian study of only major lower extremity amputations in a large tertiary hospital vascular surgery department found 50% of amputations were associated with diabetes [8] Other causes contributing to major amputations included peripheral arterial disease (76%), infection (20%), and trauma (3%) [11]. Thus, it may be suggested that most amputations are associated with a potentially preventable condition, complication or circumstance. These differences in Lower extremity amputation rates appear to becoming more important in analysing health care as they are increasingly used as a marker of the quality and overall structure of health care services; particularly in diabetes [7]. Studies consistently demonstrate that best practice foot complication management utilising multidisciplinary foot teams and well structured and integrated health care services can significantly reduce amputation rates; particularly in diabetes and peripheral arterial disease populations [12,13] The risk of amputation in diabetic patients is increased up to 15 fold [14].

In our study, peripheral vascular diseases ranked third as indication for major limb amputation. This may be due to complications of diabetes mellitus.

In agreement with other studies [15, 16] most of our amputations were performed in the lower limbs and below knee amputation was the most common procedure performed. This finding confirms that lower extremities are injured more often than the upper extremities and diabetic gangrene is common on the lower extremities than elsewhere on the body. However, other studies reported above knee amputation as the most common procedure performed than below knee amputation [14, 15]. This can be explained by the stage of the limb lesions: late presentation with spreading gangrene or advanced diabetic foot gangrene or malignant lesions that have involved the underlying bones may force the surgeon to opt for a higher level of amputation.

CONCLUSION

Complications of diabetic foot ulcers and trauma resulting from road traffic crashes were the most common indications for limb amputation in our study. Good diabetic control and early recognition and management of risk factors for foot complications, prevention of road traffic crashes and community health education, will reduce the number of patients undergoing limb amputations.

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Multimodal analgesia and rehabilitation protocol in total knee replacement: a pilot study

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Pain is of considerable concern in patients undergoing total knee replacement (TKR). Although uncontrolled pain is an acknowledged obstacle to functional recovery, analgesic strategies during rehabilitation have yet to be integrated into clinical practice; in fact, pain reduction can promote the recovery of physiological voluntary muscle contraction[1].

Oxycodone is effective in alleviating postoperative pain[2,3]; in addition, a recent association with naloxone has shown a significant reduction in the incidence of side effects[4].

The surgical stress response includes inflammatory components; nonsteroidal anti-inflammatory drugs (NSAIDs) have been reported to decrease pain scores postoperatively[5] and are used synergistically with opioids[6]. Furthermore, previous studies demonstrated the efficacy of perioperative administration of corticosteroids to improve analgesia and immediate recovery after TKR[7], even when combined with a multimodal analgesic regime[6].

Given the expanding numbers of arthroplasties, the optimal postoperative management is becoming increasingly important as a public-health concern. If pain control affects restoration of functional autonomy and/or postoperative utilization of resources, the clinical and economic consequences of pain control could be substantial[1].

We conducted a randomized, double-blind, placebo-controlled trial to assess whether multi-modal pain treatment (preoperative steroids administration, COX-2 inhibitors and controlled-release opioids) is able to provide superior control of postoperative pain which results in better functional recovery following unilateral TKR in comparison with on-request, immediate release analgesics.

METHODS

Patients who were scheduled for unilateral TKR for osteoarthritis were eligible. After enrolment, patients were divided in two groups (a study and a control group) with a help of a simple randomization scheme generated by software (www. randomization. com); the physician who made the evaluations was blinded about the patient's allocation.

The severity of preoperative pain (T0) was assessed using a visual analogue scale (VAS), both at rest and during activity (flexion-extension active movement). Postoperative pain was assessed in two ways: pain at rest was assessed by measuring VAS at days 4 and 15, and pain during activity was assessed by VAS at days 4 (T1) and 15 (T2).

Passive Range of Motion (ROM) was recorded preoperatively (T0) and postoperatively at days 4 (T1) and 15 (T2).

Differences between measurements in each group were evaluated with Dunn's Multiple Comparison Test. Differences between groups were evaluated at t0, t1 and t2 with the Mann–Whitney U-test. An α error value of 0.05 was chosen.

Patients of study group started on the day before intervention with Oxycodone-Naloxone (ON) 20 mg-10 mg every 12 hours; in addition, they received a single dose of Methylprednisolone 125 mg i. v. just before performing anaesthesia. After surgery, this group continued with ON 20 mg-10 mg every 12 hours and Etoricoxib 90 mg daily for 2 days, then they received only ON 10-5 mg every 12 hours for 10 days.

The placebo group received acetaminophen-codeine 500-30 mg as needed (three doses/day maximum) for 15 days.

Both groups participated in a standard rehabilitation program for three hours each day.

RESULTS

Thirty-three patients who met the inclusion criteria were enrolled in the study, randomized and allocated to one of the treatment arms: study group (n=17) and control group (n=16).

Compared to the control group, a significant and early improvement in pain control was observed in patients who received multi-

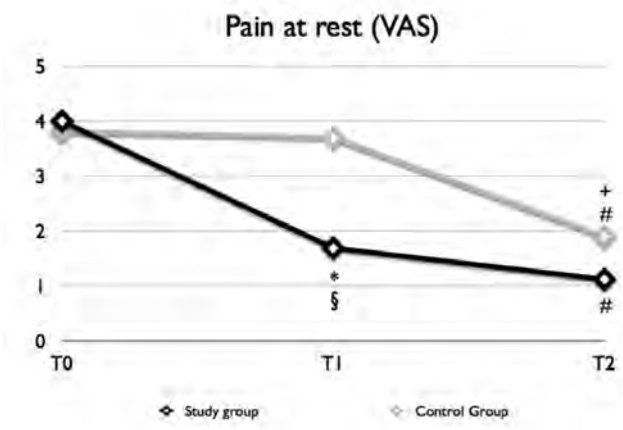

Figure 1.—Pain at rest at inclusion and follow up (* $p < 0.05$ T1 vs T0, # $p < 0.05$ T2 vs T0, + $p < 0.05$ T2 vs T1, § $p < 0.05$ study group vs control group).

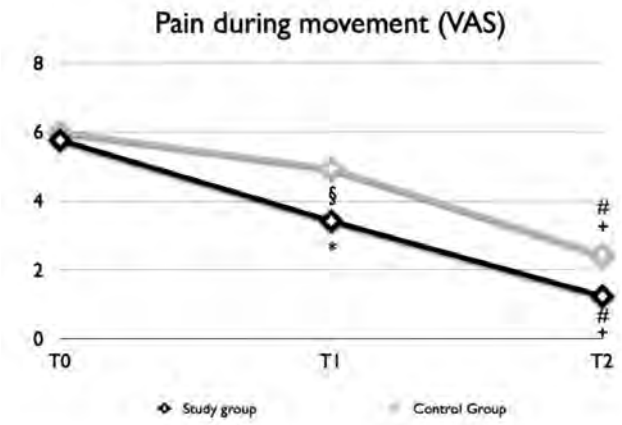

Figure 2.—Pain during movement at inclusion and follow up (* p < 0.05 T1 vs T0, # p < 0.05 T2 vs T0, + p < 0.05 T2 vs T1, § p< 0.05 study group vs control group).

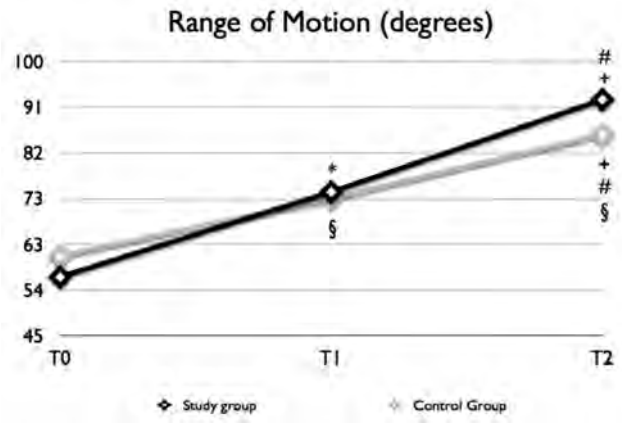

Figure 3.—Range of motion at inclusion and follow up (* p < 0.05 T1 vs T0, # p < 0.05 T2 vs T0, + p < 0.05 T2 vs T1, § p< 0.05 study group vs control group).

modal treatment at day 4, both at rest (Figure 1) and during activity (Figure 2) (p<0.05).

Moreover, these patients showed a significantly greater gain in ROM of the knee at days 4 and 15 (p<0.05) (figure 3).

DISCUSSION

In our study we demonstrated the efficacy of multimodal management of postoperative pain after TKR, which can minimize noxious stimuli leading to improved pain control and more rapid functional results.

In fact, as previously reported, controlled-release opioid preparations provide stable serum concentrations, avoiding the fluctuations of immediate release formulations[2], driving to a more efficient control of the postoperative pain[8].

Moreover, the surgical stress response includes inflammatory components and may be of importance for postoperative pain and recovery. The activation of the cyclooxygenase inflammatory pathway and subsequent prostaglandin synthesis is a part of the body's response to surgical trauma leading to activation of peripheral nociceptors and central sensitization of pain symptoms[1]. As previously demonstrated, the combination of NSAIDs and corticosteroids can control the inflammatory response, with a significative role as a adjunctive treatment for postoperative pain[6,7].

In our opinion, this pilot study could have clinical and economic implications. In fact, an appropriate management after TKR can optimize the control of postoperative pain, leading to improved and accelerated functional recovery.

CONCLUSIONS

A multimodal analgesia protocol in TKR, associated to rehabilitation treatment, leads to improved pain control and more rapid functional results. Moreover, an appropriate pain management could optimize the use of healthcare resources.

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Limiti e modalità del consenso informato per le metodiche invasive in medicina riabilitativa alla luce dell'attuale legislazione

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La medicina del dolore abbraccia diverse discipline e servizi dedicatisono in continuo aumento, sia all'interno del SSN pubblico chein strutture private. Nel corso degli anni, con l'introduzione di nuovi mezzi, sono cresciutele possibilità e le capacità diagostico-terapeutiche, si sono strutturate le specializzazioni che, gradualmente, hanno privato il medico della visione a tutto campo del malato ed allo stesso tempo lo hanno posto di fronte a nuove problematiche. La terapia in Medicina del Dolore è diventata così terapia a vasto raggio, alla ricerca del benessere dell'individuo, nella sua interezza di corpo, mente e spirito e non solo semplice risoluzione sintomatologica della patologia. Attualmente porre l'attenzione sulla malattia significa considerare la necessità dell'uomo malato, affrontando i suoi disagi: dolore, sofferenza, handicap e disabilità. In questo contesto il comportamento del medico deve essere adeguato: all'interno del rapporto medico-paziente in cui parte essenziale ricopre il dialogo tra le parti, la ricerca del consenso informato scritto al di là dell'obbligo legale è il momento iniziale di avvio di ogni terapia antalgica. Se da un lato va riconosciuto il diritto del paziente di decidere liberamente a quali trattamenti terapeutici sottoporsi ed a salvaguardarela propria integrità psichica e fisica, non si può negare l'impegno che il medico deve porre per far sì che il paziente sia davvero in grado di poter decidere. Per rendere proficuo questo scambio occorre che la relazione medico-paziente sia impostata sulla reciproca intesa e sul rispetto: al diritto alla salute del paziente corrisponde il dovere di poter esercitare la propria professione correttamente. La ricerca del consenso informato è implicita nelle terapie antalgiche non routinarie e che richiedono una approccio invasivo. Non bisogna dimenticare tuttavia che essa è regolata sia dal punto di vista costituzionale che nell'ambito della deontologia professionale. In Italia il consenso informato si basa sul dettato costituzionale (art.32) che sprime il concetto della salute come "bene-diritto fondamentale ed inalienabile dell'individuo". A questo principio corrisponde la normativa penale dell'art.50 che specifica come, in presenza del consenso dell'avente diritto, l'atto medico è lecito solo quando l'individuo fruitore di tale diritto, spontaneamente e consapevolmente, partecipi all'atto diagnostico e terapeutico. Alla luce di quanto sopra, la necessità di ottenere il consenso informato non dovrebbe essere considerata come pura formalità da espletare ogni volta che il medico si accinga ad effettuare una diagnosi e la conseguente terapia, ma una buona occasione per la realizzazione di un'alleanza terapeutica. Esiste nel consenso informato, inoltre, l'impegno da parte de medico di garantire l'informazione appropriata (in relazione alla capacità di comprendere del soggetto) di mettere a conoscenza il paziente delle sue condizioni. Di proporre i mezzi diagnostici e terapeutici più idonei, informandolo su tutti i possibili trattamenti idonei alla risoluzione della sua malattia, unitamente ai benefici ed ai rischi che ogni terapia necessariamente comporta. Se non esiste l'obbligo di garantire la guarigione esiste, tuttavia, quello di assicurare le condizion migliori per effettuare la diagnosi e per proporre la terapia singolarmente più appropriata. L'atto medico, in passato, era vissuto in senso paternalistico-ippocratico reso valido in base alla convinzione che soltanto il medico potesse essere il depositario della salute del paziente: il paziente subiva passivamente il percorso terapeutico, in molti casi senza comprenderlo appieno. Attualmente la situazione si è per certi versi ribaltata e viene riconosciuto il primato della volontà e dell'autodeterminazione della persona malata nell'assenso all'atto diagnostico e terapeutico. In un documento del 20/6/1992 (articoli 29, 30, 31, 32, 33) il Comitato Nazionale per la Bioetica ha indicato le linee di comportamento per l'operatore sanitario perché vengano salvaguardate l'autonomia diagnostica e terapeutica del paziente. Queste indicazioni e l'ottenimento del consenso informato, palesemente espresso, non libera ovviamente il medico dalle responsabilità legate alla propria professione. In presenza di importanti malattie l'incontro medico paziente non deve essere fugace ed unico: l'informazione offerta al paziente deve essere precisa, attenta, personalizzata, completa e scientificamente corretta. Sebbene tutto ciò possa sembrare burocratico di fatto rappresenta per il medico la possibilità di entrare in relazione con il paziente, costruendo il rapporto attraverso un'interazione basata sul riconoscimento interpersonale ed egualitario. Agire in assenza di consenso oppure andare oltre il consenso del paziente, costituisce non solo un illecito deontologico, ma anche un reato, indipendentemente dalla presenza di un eventuale danno. Infatti, in assenza di danno obiettivo rilevabile, se si agisce in assenza di consenso, si può configurare il reato di violenza privata (art610 C.P.) o quello di lesioni personali (art.582 C.P.): l'atto medico è un illecito indipendentemente dal fatto che da tale atto ne derivi o meno un beneficio per il paziente. Da una sentenza della Corte di Cassazione (N.6464 del 08/07/1994) è stato sancito l'obbligo di ottenere il consenso prima del trattamento, indipendentemente dalla presenza o assenza di errori da parte del medico. Se dovere del medico è a tutela della vita e della salute fisica ed il sollievo dalle sofferenze e dolore, ne deriva l'impegno di considerare la salute nel senso più ampio del termine.

BACKGROUND ETICO LEGALE

Prima di esaminare, trattare o prendere in carico un paziente adulto, deve essere ottenuto un consenso informato. Il consenso è "un diritto del malato" che deve avere esaurienti informazioni sull natura e sulle eventuali conseguenze del trattamento curativo al quale si deve sottoporre ed autorizza il medico ad operare sen-

za intercorrere in un arbitrio. Un diritto che deriva direttamente dall'art 32 della Costituzione in base al quale "nessuno può essere obbligato ad un determinato trattamento sanitario se non per disposizione di legge". È quindi un grave errore ritenere che il consenso informato, come spesso accade, sia una procedura necessaria, ma del tutto formale, quasi un atto burocratico, tanto che in molti casi il paziente non riesce a capire quale sia lo stato della sua malattia e quali sono gli eventuali rischi ai quali può andare incontro nel sottoporsi ad un trattamento invasivo, come talune indagini diagnostiche e tutti gli interventi operatori. Di recente, poi, vi è stata una specie di "novità" nella citata procedura del consenso informato. È derivata da una sentenza della III Sezione civile della Corte di Cassazione (n. 14638 del 30 Luglio 2004) secondo la quale la responsabilità ed i doveri del medico nei riguardi del malato non si devono limitare all'attività del medico stesso e della sua equipe, ma si estende alla struttura sanitaria nella quale opera con ulteriori doveri d'informazione verso il paziente. È dunque il consenso informato, in vista di un intervento o di un'altra terapia od accertamenti invasivi, non riguarda soltanto i rischi legati alla situazione soggettiva ed allo stato dell'arte della disciplina, ma anche alla concreta situazione della struttura ospedaliera in modo che il paziente stesso possa compiutamente decidere se sottoporsi sia l'intervento proposto e se farlo in quella struttura o richiedere di eseguirlo altrove. La materia, delicata ed allo stesso tempo spinosa, è costantemente in discussione ed all'ordine del giorno in ogni ambito ed attualmentein discussione quale disegno di legge, d'iniziativa del senatoreTomassini (comunicato alla Presidenza d el Senato il 4 Maggio 2004) recante il titolo "Norme in materia di dichiarazioni anticipate di trattamento" (Legislatura 14º - Disegno di legge N. 2943, Senato della Repubblicato- XIV Legislatura: visibile on line al sito www. sanita. it) La procedura deve sempre garantire, peraltro, la riservatezza dei Suoi dati personali con riferimento al relativo Codice (D.lgs. Del 30 giugno 2003, n. 196), ai sensi del cui art. 13 si sottopone la seguente informativa: in conformità alle disposizioni del Codice in materia di protezione dei dati personali, il medico e la Struttura Sanitaria informano il paziente su cosa intendono svolgere e se intendono svolgere anche attività di trattamento di dati personali, anche sensibili, chelo riguardano. *Finalità e modalità del trattamento dei dati* I Dati forniti vengono acquisiti e trattati nel rispetto della normativa sopra richiamata, con il supporto di mezzi cartacei, informatici o telematici atti a memorizzare, gestire e trasmettere i dati stessi e comunque mediante strumenti idonei a garantire la loro sicurezza e riservatezza, nel rispetto delle regole fissate dal Codice, per le finalità descritte riguardo agli obiettivi, alle procedure, ai benefici ed rischi della partecipazione, all'impegno operativo e temporale richiesto.

Natura del conferimento e conseguenze di un eventuale rifiuto

Deve essere chiaro al paziente che l'eventuale rifiuto di fornire i dati funzionali all'esecuzione della procedura proposta, non comporta alcuna conseguenza relativamente ad eventuali trattamenti terapeutici in corso, salva l'eventuale impossibilità di dare seguito alle operazioni connesse a ricerche o trattamenti connessi alla procedura rifiutata. Egli è libero di non accettare la procedura o di ritirarsi dalla stessa anche senza preavviso o motivazione. Qualora, durante la presa in carico, divengano disponibili dati che possano influenzare la sua volontà di continuare egli sarà tempestivamente ed opportunamente informato e, se necessario, gli sarà richiesto nuovamente il Consenso Informato a proseguire il trattamento in corso.

COMUNICAZIONE DEI DATI

Va chiarito infine se eventualmente i dati potranno venire a conoscenza dei responsabili della cui opera la struttura sanitaria si avvale nell'ambito di rapporti di esternalizzazione per la fornitura di servizi, nonché dei responsabili e degli incaricati del trattamento dei dati per le finalità di cui alla proposta informativa, l'elenco aggiornato dei quali deve essere messo a disposizione presso la sede ove il paziente è preso in carico.

I Dati relativi ai risultati del trattamento sono strettamente confidenziali e soggetti ad anonimato. Va infine spiegato che risultati potranno essere eventualmente portati a conoscenza di terzi o pubblicati, ma escludendo ogni possibile riferimento personale al paziente Procedure ed indicazioni per la stesura di moduli di consenso informato Le indicazioni (qui presentate in appendice B) definiscono le caratteristiche irrinunciabili (eticamente e legalmente) che devono presentare i moduli di consenso informato per la partecipazione di soggetti umani a procedure invasive e/o sperimentali. Il consenso del soggetto, come visto, può essere richiesto solo dopo che gli sono state fornite adeguate informazioni sullo studio, nonché sui suoi diritti e responsabilità.

COMMENTI

Crediamo che il processo che porta all'ottenimento del consenso informato per le procedure invasive normalmente dovrebbe essere attentamente riconsiderato da tutti gli specialisti (soprattutto negli ambulatori privati). Così come utile è considerare i potenziali effetti benefici, va raccomandata un'esplicita discussione dei rischi correlati al trattamento proposto. Non è consigliabile ottenere un consenso informato senza essersi accertato che il paziente abbia capito a fondo ciò di cui si è discusso. Mentre queste considerazioni sono basate sulle " good ethical pratice" in tal senso ci sono anche limiti posti dal legislatore. Sulla base delle recenti ricerche in generale tutte le metodiche invasive in terapia del dolore sono abbastanza sicure se effettuate da mani esperte e "weel-trained". I materiali vanno scelti con cura e l'approccio deve essere idoneo (es. sepsi, ecc.). Inoltre ci si deve accertare che il paziente abbia ben compreso i rischi e li abbia presi nella giusta considerazione al momento della firma del consenso. Bisogna ovviamente accettare che in effetti in alcuni casi ciò potrebbe limitare l'operato del medico, ma rispetta in pieno i diritti del malato.

CONCLUSIONI

Il consenso informato è un atto importante nel rapporto tra medico e paziente, tra una struttura sanitaria ed il paziente. Consiste nell'accettazione del malato delle proposte diagnostico- terapeutiche fattegli dal medico. L'accettazione deve essere data consapevolmente dopo che il paziente viene preventivamente informato sul suo stato di salute, delle speranze e dei rischi che si accompagnano all'effettuazione delle prestazioni che gli vengono spiegate. Si tratta dunque di una procedura importante: il consenso informato, che non necessita per prestazioni non invasive, è un atto di rilevante interesse sia per il medico curante che per il paziente ed è una procedura che deve essere chiara ed esaustiva. Qualsiasi terapia antalgica invasiva non deve venire meno ad una comprovata efficacia e richiede, comunque, l'acquisizione del consenso informato, nel pieno rispetto delle procedure (appendice B).

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Functioning and Disability in post-mastectomy patients

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Mastectomy is the medical term for the surgical removal of one or both breasts, partially or completely. Mastectomy is usually done to treat breast cancer. In some patients it´s possible to do a wide local excision, also known as a lumpectomy, an operation in which a small volume of breast tissue containing the tumor and some surrounding healthy tissue is removed to conserve the breast. Both mastectomy and lumpectomy are local therapies for breast cancer, targeting the area of the tumor, as opposed to systemic therapies such as chemotherapy, hormonal therapy, immunotherapy or radiotherapy. Sometimes, it´s necessary to make the removal of the lymph nodes in the armpit. Lymphedema is an abnormal buildup of fluid that causes swelling, most often in the arms or legs. The condition develops when lymph vessels or lymph nodes are missing, impaired, damaged, or removed. It can develop after breast surgery because there is an alteration in the pathway that drains the fluids involved in the immune system. It may occur at any time after the surgery. If untreated, it may become worse. A well done rehabilitation programme is essential to avoid complications such as infections or lymphangiosarcoma. The objective of the research is to characterize the senology-rehabilitation consultation patients in Hospital de Faro and search for the importance of rehabilitation in their quality of life, based on the International Classification of Functioning, Disability and Health (ICF).

MATERIALS AND METHODS

In this study, 80 patients of senology-rehabilitation consultation have been analyzed. A questionnaire was made based on ICF components. Functioning and Disability (body component, activity and participation) were searched with questions about mastectomy, the removal of the lymph nodes in the armpit (axillary nodes), lymphedema, physical therapy, compression sleeve, activities limitations (shoulder mobility, self-care, domestic work, driving), participation restriction (depression, confidence, communication, motivation at work), breast prosthesis and breast reconstruction surgery. Contextual factors were searched with questions about family, friends support and social discrimination.

RESULTS

The mean age of patients was 59.3 years and lumpectomy was done in 35% of them. Patients operated for over one year represent 38% of the patients in this study and women represent 98%. The removal of the lymph nodes in the armpit was done in 90% of patients submitted to surgery. Lymphedema appeared in 68% of these patients. Trauma was associated to the beggining/worsening of lymphedema in 7.4% of patients, overstrain in 39%, skin lesions in 15% and heat in 46%. Physical therapy and compression sleeve were part of the treatment in 94% and 63% of the patients with lymphedema, respectively, and the edema improved in 92% and 85% of them, respectively. Activities limitations happened in 65% of the patients (71% in shoulder mobility, 38% in self-care, 85% in domestic work and 17% in driving) (Figure 1). Participation restriction ocurred in 75% of the patients (66% had depression, 46% less communicative, 38% less confidence and 26% less motivated at work) (Figure 2). 38% of patients used breast prosthesis and 97% of these improved their participation activities. Breast reconstruction surgery was made in 9% of patients and 71% improved their social participation. Family and friends support was described by 94% of patients and 4% felt discriminated by society (Figure 3).

Figure 1.—Activities limitations.

Figure 2.—Participation restriction.

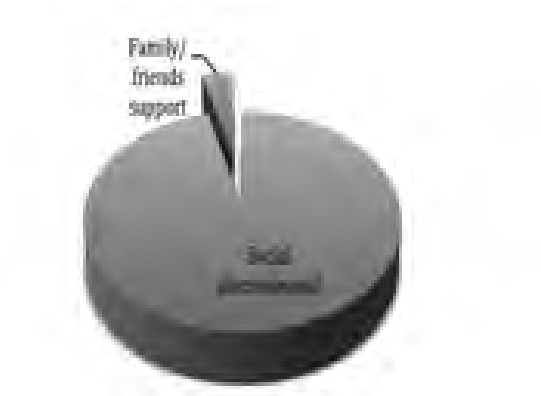

Figure 3.—Contextual factors.

DISCUSSION

In this study women represent 98% of the patients who have been analyzed in the senology-rehabilitation consultation in Hospital de Faro. Lymphedema appeared in 68% of patients submitted to the removal of lymph nodes in the armit. Heat was more associated to the beggining/worsening of lymphedema (46%). Physical therapy and compression sleeve improved the edema in 92% and 85% of the patients, respectively, and they were important to their treatment. Activities limitations happened in 65% of the patients and domestic work was more affected then others (85%). Participation restriction ocurred in 75% of the patients and depression was the most significant (66%). 94% of the patients felt family and friends support and only 4% felt discriminated by society.

CONCLUSIONS

Mastectomy and lumpectomy are usually done to treat breast cancer. Lymphedema can develop after breast surgery because there is an alteration in the pathway that drains the fluids involved in the immune system. An appropriate rehabilitation programme has a crucial role in decreasing activities and participation limitations of these patients. Physical therapy, compression sleeves or breast prosthesis can contribute to help these particular patients.

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The rehabilitation of memory disturbances in acquired brain lesions: one case report

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Different types of memories exist: the Short Term Memory (STM), characterized by a determined number of spans that each subject is able to record and from a Working Memory (WM) that consists in maintaining active the information coming from the Long Term Memory (LTM); wich is also characterized in turn by two subcomponents: the procedural memory (memory skills implicitly acquired those evocation occurs implicity, i. e. driving) and the declarative memory, either semantic or episodic (memories that emerge with voluntary participation); the Perspective Memory (PM) which provides the planning of actions that must be accomplished in a later time and thus also the recall in the programmed moment.

The latter involves the good operation of brain mechanisms that hold and control the cognitive functioning (Executive Functions) and thus the periodic assessment of the already performed activities and the ones that are still to be performed. Moreover, it implies the flexibility in modifying the schedule according to unexpected variations that may occur. These abilities presume the correct functioning of both the WM and the LTM.

It has been clinically reported that, despite the different vulnerability of the various types of memory to lesioning agents, usually, procedural memory is spared by brain lesions even in case of Global Amnesic Syndrome. This sparing is exploited, in the neurorehabilitation field, in order to train patients in daily tasks, such as instrumental ADL (cooking activity, shopping, …).

From clinical experience, it is known that among severe acquired-brain damages, Global Amnesia is one of the most invalidating outcomes for regaining independence.

The role and the challenge of the Cognitive Rehabilitator is to implement the spared cognitive abilities of patients affected by acquired cerebral damage, by identifying the most suitable 'strategies' for each single patient, starting from the specific disablement typology.

Recent data from Consensus Conference (Cicerone, 2000, 2005, 2011; Cappa 2005; C.C. Siena 2010).

In the approach of a patient affected by a severe acquired-brain lesion, in the sub-acute phase, following an initial period at the Reality Orientation Therapy (ROT) that necessary for exiting Post Traumatic Amnesia (PTA), several training methodologies for facing residual memory deficits have been described:

— Mnemotechiniques (mental strategies that have been developed to be used in healthy persons to facilitate memorization) which, however, have been considered not efficient as for daily life, as they are not generalized in other contexts.

— External aids, the training of which has been formalized and applied since the '90s. Although the promising results obtained, it has been confirmed that patients trained with this procedures often dropped the use of the agenda, once discharged from the hospital, having the same non-satisfying results in terms of practical efficiency in daily life of the acquired strategy.

— On the contrary, from a recent study, it has been suggested the use of "Google Calendar" as an aid. This is an electronic calendar with free internet access, that can be used as external aid, either active or passive.

Our work was performed using such equipment by applying it specifically to a patient: male I.A. 39, lower average education affected by Post Anossic Encephalopathy occurs in 29.06.2011 due to Atrial Fibrillation.

The patient was in hospital at AUOSMM Udine (Intensive Rehab Department) from acute event to 13.07.11.

Then discharged and admitted at IMFR Traumatic Brain Injury Gervasutta Hospital in Udine at 13.07.11.

The in-patient I.A. performed open eyes if called, head and eyes shifted on the left, grimmage at noxious stimulus and used NGT, VC, tracheotomy.

At discharge the patient's Diagnosis was: " Global Amnesic Syndrome with severe attention and memory deficites... difficulties in Spatial and Temporal orientation even in domestic contest"... at discharge the setting was living with his mother, but maintaining the apartment where he lived before the cardiac arrest at rent. The

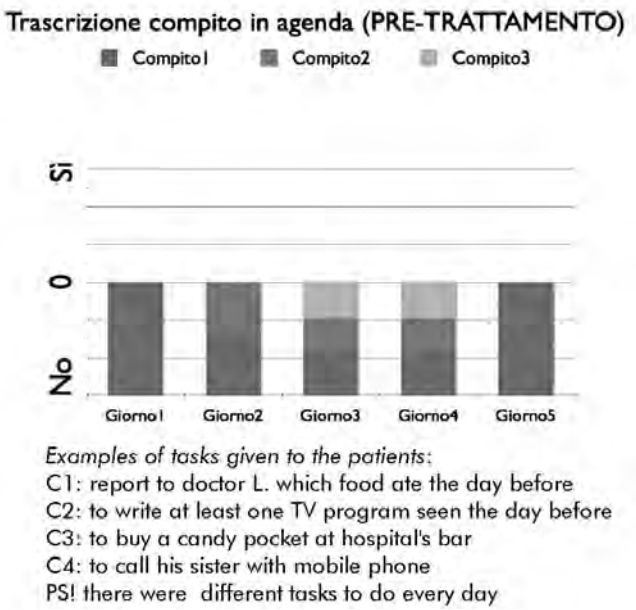
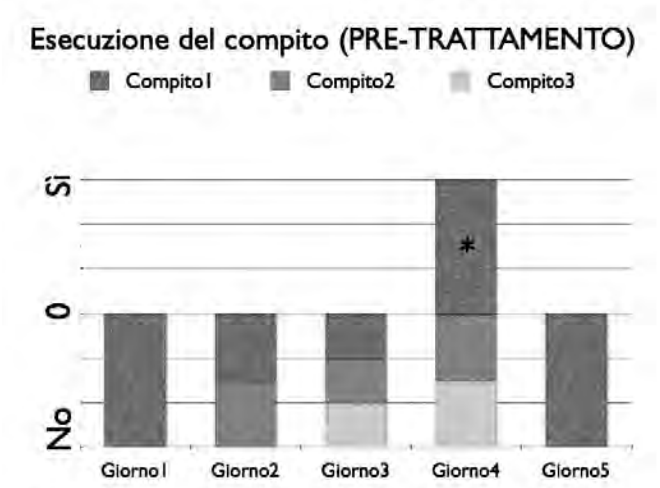


Figure 1.—From "Functional Task Baseline".



*It has been immediately done the task given, to the patient: to go at hospital's lodge to take an envelope for him and take it to doctor's L. office. Probably the task has been done correctly in pre-treatment, because of an ambient facilitation's presence: hospital's lodge is an obligatory way to get into the hospital.)

Figure 2.—From "Functional Task Baseline".

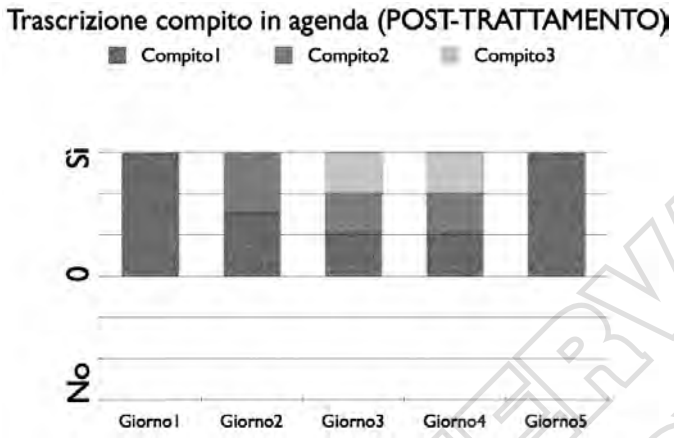


Figure 3.—From "Functional Task Baseline".

goal was the maximum capability achievable of an independent life, at his own home.

The post-acute rehabilitation perspective showed at discharge from IMFR the patient had regained independence in walking capabilities and Primary ADL, however, needed assistence and supervision 24 hours because of the risk of accidents at home because of Neuropsychological disorders of Memory, Attention and goal neglect.

From the date of discharge from hospitalization from IMFR, Mr. I.A. was in charge for neuropsychological rehabilitation activities (cognitive functioning, emotional and relational ones) as outpatient c/o Neuropsychological Rehabilitation Unit of Acquired Turbe (SOS URNA) of the same IMFR Gervasutta. This rehabilitation programs until 18/04/12 were carried out with weekly appointments at IMFR SOS URNA, for one/two hours a day with the outcome of recovery of cognitive functions related to instrumental activities of daily living (such as shopping, cooking, means of transport...) moreover for two days a week Mr I.A. followed a rehabilitation program of Occupational Therapy followed by IMFR Gervasutta Hospital and a Neuropsychological training carried out by an educator, degree in Psychology, experts trained and supervised by dr. Lindaver, funded by family's patient. After 4 months of intervention, at the assess control of 08.03.2012, the following results were observed: "remains severe psychomotor retardation, severe disorder of attention and goal neglect, in a diagnosis of Global Amnesic Syndrome".

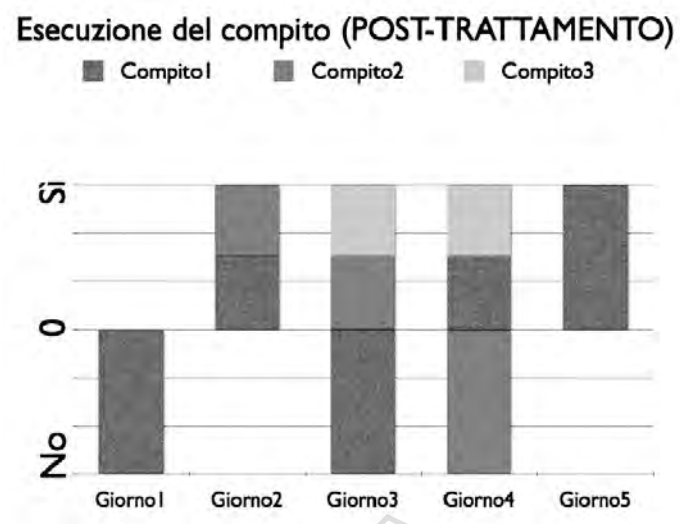


Figure 4.—From "Functional Task Baseline".

Given the experience and supported by the international scientific literature in the field of brain injury, where it is clear that several months after the pathological event, guided by specific neuropsychological rehabilitation intervention such as the one offered by our rehabilitation units, we decided to continue the individualized intensive rehabilitation program for the purpose of a reemployment project called AIRONI (Attività Integrata di Riabilitazione Olistica Neuropsicologica per l'Inserimento= Integrated Activity of Olistic Rehabilitation for Social Integration) (already funded by Law 41/96) which was held c/o SOS URNA Gervasutta and partly c/o Cooperative Hattiva, starting of 8.05.2012. It is simultaneously activated, by the Municipality of Mr. I.A. a *Project of Independent Living* for a period of four months, which included home intervention of a figure educational expert in the Neuropsychological Rehabilitation, identified and coordinated by our center, which continued the home rehabilitation already begun.

The objectives were specifically:

— achieving complete autonomy (100% performance) in house reorganization, dishes and clothes cleaning.

— city orientation as capability of Extended ADL

— use of means of transport as bike, in his own little town and in the next city, in the respect of highway code autonomy in the home-stay in membership for 3 nights at week and management of cleaning house (there was a previous coaching by his sister).

The Neuropsycological evaluation performed at 30.05.12 observed these results: highlighted obvious difficulties in memory, attention and executive functions. The mood appeared depressed because of the inability to be independent in the living environment (still lived with his mother and sister), and because he had not returned to work. The Rehabilitation Project has therefore focused to an improvement of awareness of the disease, increased autonomy, improved mood and ability to recognize their own emotional states to make the most appropriate compensation strategies, upgrading work with the use of any external aids. All this for a subsequent period of another 6 months. (Google Calendar), increased autonomy in Primary ADL and Extended ADL, autonomy in movements (using public means of transport) improvement of mood (with conversation with psychologist and psychological assessment to scores with psychological interviews), ability to maintain a work (initially protected) for at least 3 months. Indicators used were: improvement of performance in Neuropsychological tests, critical reading skills of their own cognitive deficits and subsequent use of functional aids.

Functional valoration of Back School Program

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Low back pain is a common health problem due to its high frequency in the population. Worldwide, 65-80% of the population experience low back pain at some stage of their lives (1). It is the main cause of disability for people in their work years. Lower back pain involves a large number of professional consultations and a high use of health services so it has a great socioeconomic impact (2). BSP relies on informing and educating people both healthy and suffering from back pain (3). The aim of this study was to evaluate the effectiveness of a back school program in patients with low back pain, as well as their satisfaction.

MATERIALS AND METHODS

Prospective observational study carried out from October 2011 to February 2012 involving 51 outpatients with low back pain referred from our Rehabilitation Unit who attended the BSP. The BSP consisted on three one and a half-hour sessions on alternate days for a week, lectured by a physician with the help of slides. The topics discussed in the sessions are outlined in Table 1.

Right after the end of the BSP and three months later the evolution of the disability, pain and the influence of psycho-social factors involved in low back pain were measured with the Visual Analogic Scale (VAS), Oswestry Low Back Pain Disability Questionnaire (ODQ) (4) and Fear Avoidance Beliefs Questionnaire (FABQ) (5), respectively. A linear regression statistical analysis was then performed on the data.

RESULTS

A total of 51 patients completed the study. The median age was 62.5 years (SD: 12.7 years). The baseline characteristics of the patients are shown in Table II. After BSP statistically significant results ($p < 0.01$) were found in reducing disability assessed by Oswestry Questionnaire (initial: 24%> 40; final: 16%> 40) and pain relief (initial VAS=7; final=5). A decline in the influence of psychosocial factors in pain and disability measured by FABQ (initial = 38, end = 28) was observed. The rest of the data is outline in tables III and IV.

DISCUSSION

In this prospective study we found out that BSP has a positive effect in the decrease of pain levels and disability levels at three months follow-up. The main limiting factors in this study are the short term studied and the lack of a cost analysis.

One third of the patients were retired. We believe this fact to have had no effect in the results because retired people carry out a considerable ammount of physical activity, be it in or outside their homes. The external validity of the scale with respect to other groups of patients has not been evaluated.

Table II.—*Baseline characteristics.*

	Subjects (n=51)	Percentage (%)
Age, years (SD)	62.5 (12.7)	
Pain type		
Chronic	37	72.5
Acute	14	27.5
Ocupation		
Employed	24	47.1
Retired	18	35.3
Sick leave	7	13.7
Unemployed	2	3.9
Previous treatment		
Analgesics	39	76.5
Rehabilitation	41	80.4
Surgery	7	13.7

SD: standard derivation

Table III.—*Baseline characteristics.*

	Baseline	3 months	p
VAS	7	5	0.001*
ODQ	24% > 40	16% > 40	0.001*
FABQ	38	28	0.005**

*p<0.01, **p<0.05
SEM: standard error of the mean; VAS: Visual Analogue Scale; ODQ: Oswestry Low Back Pain Disability Questionnaire; FABQ: Fear Avoidance Beliefs Questionnaire.

Table I.—*Topics discussed in the sessions.*

First session	Second session	Third session
Anatomy and spinal column function	Standing and seating pose	Exercise and reset
Possible causes for pain	Dangerous movements or poses	Rest's adverse effects
Emotional components for pain	Handling loads	Ways to exercise
Back protection mecanisms for patients in bed	Everyday activities	Information on treatments

Table IV.—*Results three moths later.*

	Subjects (percentage %)
Less analgesic consuption	44 (86.3%)
Physical activity change	32 (62.7%)
Less professional consultation	40 (78.4%)

The main strengths of this study are the use of validated results and the low number of people abandoning it. The VAS, ODQ and FABQ punctuations reduced significatively three months after attending the BSP. Some studies recommend attending a BSP to reduce disability in the short term and returning to work after finishing the sick leave (6).

Cronic pain induces physical limitations and increases the posibility of falling into depression thus reducing people's physical conditions. A decrease in the patient's pain level can therefore increase functionality and psyco-social factors while reducing discapacity (7). The present study evaluated all three parameters and observed significant improvements in all of them. The BSP tries to educate patients by teaching them some anatomy and explaining the function of the lumbar spine, possible causes of pain and its emotional components and emphasize the need of performing physical activity to improve their life quality (3,7).

There are many studies that support the idea that BSPs are an effective way of treating pain and disability and have a possitive impact in the patient's functional status (8,9). In this study, however, the person conducting the BSP is a doctor specialized in Physical Medicine and Rehabilitation whereas in others the conductor was a physiotherapist or a paramedic. The impact of this particular factor in the results remains undetermined.

CONCLUSIONS

BSP is a tool we commonly use in our unit to treat back pain. In the short term it allows early return to work and a decrease in pain and disability levels. The results suggest an improvement in the psychosocial factors as well as in the fear avoidance belief. This kind of intervention reduces the total amount of drugs used and the number of visits to the doctor. The patients are also satisfied with the overall results.

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Disability and quality of life assesment of stroke patients treated in stroke care unit

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Cerebrovascular diseases are the third cause of death in the western countries and the first cause of physical disability in adults. (1)

Most publications highlight the effectiveness of stroke care units and their beneficial effects on patient survival, independence and early discharge. (2)

The aim of our study is to determine stroke's impact, on patients who were admitted to stroke care units and who underwent rehabilitation treatment, by measuring disability and quality of life.

MATERIAL AND METHODS

This prospective observational study involved 61 patients over 18 years with a diagnosis of ischemic stroke between March 2011 and June 2012, who were treated and followed by our rehabilitation unit for six months. Data was retrieved on admission, discharge, first and third month after discharge. (Table I)

Scales used: NIHSS (National Institute of Health Stroke Scale), SIS-16 (Stroke Impact Scale), OCSP (Oxfordshire Community Stroke Project Classification), mRS (modified Rankin Scale), EQ-5D (Euroquol 5D), Hamilton's depression scale. Variables: sex, age, localization (OCSP), affected side, etiology, social and family support, risk factors (RF), complications, neurological deficit, general/specific disability, quality of life, depression.

Statistical analysis software: SPSS (Friedman test).

RESULTS

Mean age: 78 years. 55.7% male, 44.3% female. 67.2% had family support. Risk factors: hypertension (62.3%), body mass index ≥25 (56.6%), auricular fibrillation (34.4%), smoking (32.8%), diabetes (21.3%), dyslipemia (21.3%), previous stroke (14.8%), ischemic heart disease (13.1%), heart failure (6.6%), alcoholism (6.6%).

Etiology: 35% atherothrombotic, 33% cardioembolic, 5% indetermined, 10% unusual, 16.7% lacunar. Both sides were affected similarly. Anterior circulation was affected in 93% of the cases.

Table I.—*Data collection.*

ADMISSION	DISCHARGE	1ST MONTH	3RD MONTH
Baseline data	SIS-16	SIS-16	SIS-16
NIHSS	NIHSS	RANKIN	RANKIN
RANKIN	RANKIN	HAMILTON	NIHSS
			HAMILTON
			EQ-5D

Table II.—*Evolution of neurological deficit (NIHSS).*

NIHSS	Median	P25	P75
Admission	14,50	8,25	22,00
Discharge	6,48	3,00	8,00
3rd month after discharge	1	0	4,00

NIHSS <5: light. NIHSS 5-13: moderate. NIHSS > 14: severe.

Table III.—*Evolution of general disability (mRS).*

mRS	Median	P25	P75
Admission	5	4	5
1st month after discharge	4	3	4
3rd month after discharge	3	1	4

mRS 0-2: independence; mRS 3-6: mod-severe

Complications (55.7%): fever (18%), stroke progression (13.1%), vascular (14.8%). Half of the patients received a specific home rehabilitation program and the other half at medium-stay hospital.

Statistically significant results ($p<0.001$) appeared in:

— Improvement of neurological deficit as measured by NIHSS: admission= 14.5 (severe deficit), discharge= 5 (moderate deficit), third month= 1 (light deficit). (Table II)

— Improvement in stroke-related specific disability as measured by SIS-16: discharge= 29 (disability), first month= 41 (no disability), third month= 51 (no disability). (Graph 1)

— Improvement of general disability as measured by mRS: admission= 5 (severe disability), first month=4, third month=3 (moderate disability). (Table III)

— Decreased depression severity as measured by Hamilton's scale: first month=10 (light depression), third month= 4 (no depression). (Graph 2)

— Result of EQ-5D= 0.5442 (1=best health state, 0=death, -0,0757=worse than death).

DISCUSSION

Regardless of the overall improvement seen after stroke patients are subject to a rehabilitation program some of them will be disabled to run their daily tasks. To evaluate their functional capacity after suffering a stroke and to establish its impact in the patient specific measurement scales are needed. Using specific scales, such as SIS-16, or generic ones, such as the modified Rankin Scale, allows us to evaluate the disability for a group of patients with similar characteristics and to quantify the results of the treatment.

Figure 1.—Evolution of stroke-related disability (SIS-16).

Figure 2.—Evolution of depression severity (Hamilton's Scale).

The SIS-16 scale quantifies the patient's hand's functionality, the impact of its disability when carrying out everyday tasks and the global level of functional capacity (3). Taking into account other aspects like the impact of the illness for the patient using the EuroQol scale allows us to more thoroughly understand the level of disability and adequate the efforts to that.

We agree with other authors in that rehabilitation programs help improve patients' functionality and decrease the level of their disability. One might argue that patients in stroke units are the one with the worst condition but even those improve their condition. (4)

CONCLUSIONS

Rehabilitation, when carried out from the first stage in Stroke Care Units, helps decrease the ischemic stroke affected patient's general and specific disability, as measured by the SIS-16 and mRS scales.

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Spontaneous osteonecrosis of the knee (SONK)

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Osteonecrosis of the knee can be classified as primary/spontaneous or secondary/ischaemic/atraumatic[1]. The primary form was first described by Ahlback *et al.* in 1968; synonymously called Morbus Ahlback or Ahlback´s disease[2].

Recent studies have identified three distinct pathologic entities, all of which were previously described as knee osteonecrosis (ON): Spontaneous ON of the knee, Postarthroscopic ON and Secondary ON (it has multifactorial aetiology: corticosteroid use, alcohol abuse…)[3,4,5]. The precise aetology of ON remains unclear in detail[6,7].

It is currently common knowledge that localized vascular insufficiency leads to necrosis of the subchondral bone with subsequent disruption of the nutrition supply to the cartilage above[1]. The role of subchondral fractures is proven by histological findings.

The typical SONK patient is fifty-five years of age or older, has unilateral monoarticular pain, has limited involvement of the periarticular bone, and is involved mainly in medial femoral condyle[8]. Female patients are affected three times more often than men[6].

Diagnosis is based on clinical suspicion and radiologic confirmation. The physical examination often elicits nonspecific knee pain on extremes of range of motion. The destruction of bone and cartilage progresses in stages, and is defined by radiograph and/or magnetic resonance imaging (MRI) images. Radiography (RX) is an inexpensive modality for staging and monitoring disease progression.

Lesions can be detected earliest on MRI, because of the ability to assess marrow viability and lesion distribution. Several authors recommend that MRI is needed for early diagnosis of spontaneous osteonecrosis because it can determine more about the range of involved bone marrow and damage of cartilage by collapsed bone compared with plain radiographs[3].

Several systems are used to stage knee ON radiographically (to determine the stage of progression of SONK). We select Koshino´s stage classification[3,9]:

— Stage 1: normal plain radiographic appearance (lesions can be identified by characteristic changes on MRI).

— Stage 2: signs of mottled sclerosis are evident, but the normal curvature of the bone remains intact (Figure 1).

— Stage 3: radiolucent area surrounded by a sclerotic halo and a calcified plate, lesions exhibit subchondral fracture, as evidenced by the characteristic "crescent sign" on plain radiographs (Figure 2).

— Stage 4: lesions reveal articular collapse of the subchondral bone, joint space narrowing, degeneration on both sides of the joint, and possible osteophyte formation.

There are several treatment options for managing SONK; including microfracture technique, high tibial osteotomy, debridement and autologous bone graft. If other treatments failed or if the stage of SONK was 3 or higher, the treatment of choice is arthroplasty. Arthroplasties can be either unicompartmental or total; depending on the location, size, and progression of lesion, and on the patient´s age and activity[8].

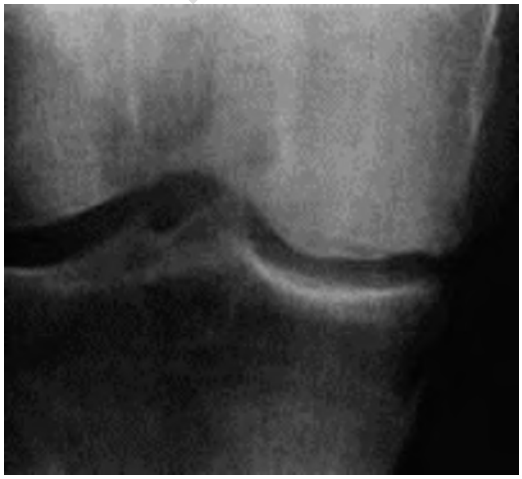

Figure 1.—Stage 2 (Koshino´s classification): signs of mottled sclerosis are evident, but the normal curvature of the bone remains intact.

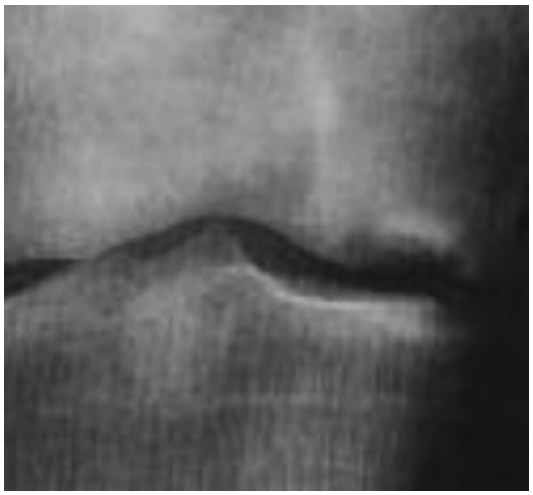

Figure 2.—Stage 3 (Koshino´s classification): radiolucent area surrounded by a sclerotic halo. The presence of a crescent sign is indicative of subchondral fracture.

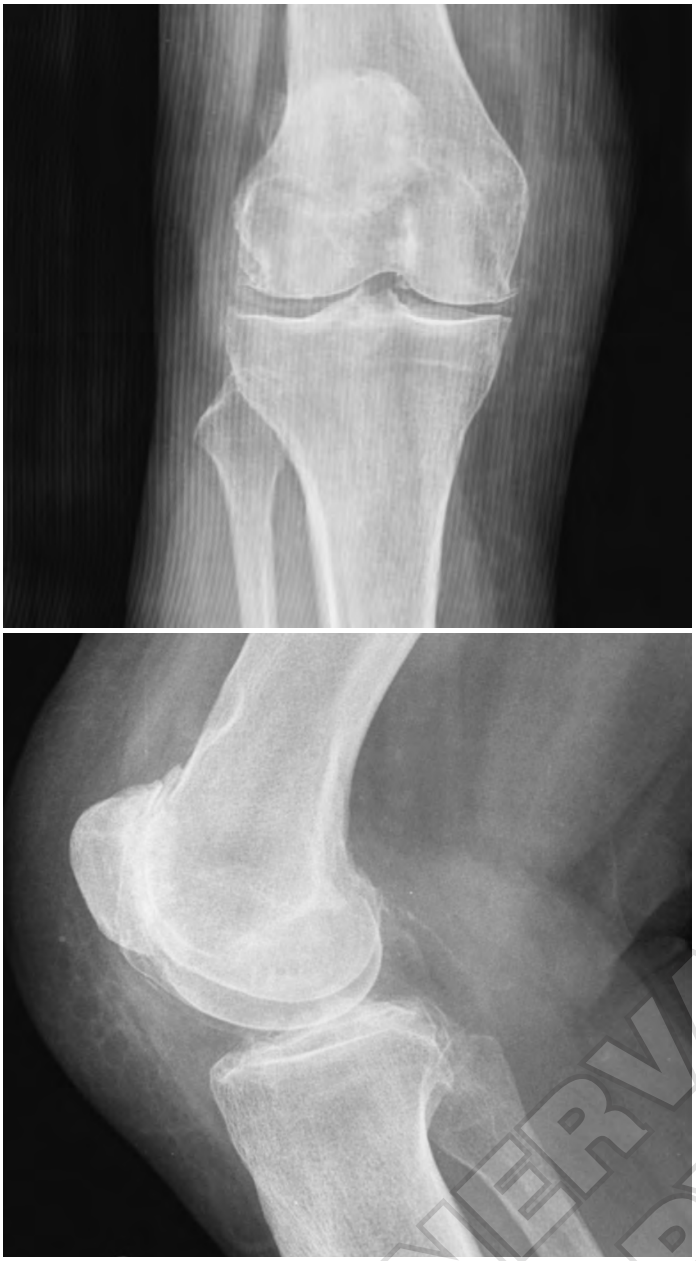

Figure 3.—A) An anteroposterior (AP) radiograph of our patient´s right knee, with severe signs of gonarthrosis femoro-tibial and femoro-patella (subchondral sclerosis, narrowing of the joint space, osteophyte formation…), and signs of bilateral chondrocalcinosis. B) Our patient´s plain lateral radiograph, demonstrating very important osteoarthritis signs.

MATERIALS AND METHODS

We present the case: a 72-year-old woman who did not have a history of recent trauma event, and had a medical history of osteoporosis and bilateral knee osteoarthritis. She complained of medial joint pain (presented with acute exacerbation of her usual knee pain). In our examination she had swelling of her both knees, free range of movement, and walked with a right limp. Her pain was localized on the medial aspect of her right knee and had much pain on palpation (Visual Analogue Scale-VAS: 7). A corticosteroid infiltration was performed allowing partial remission of pain (VAS: 3).

RX showed a severe signs of osteoarthritis: bilateral gonarthrosis femoro-tibial, femoro-patella, and signs of bilateral chondrocalcinosis (Figure 3: A, B). On MRI: Osteochondral lesion (16 mm) in the loading area of medial femoral condyle; hyperintense on T2-weighted sequences (Figure 4), and hypointense on T1 (Figure 5), associated with ill-defined in the adjacent bone marrow, compatible with osteonecrosis of the internal femoral condyle.

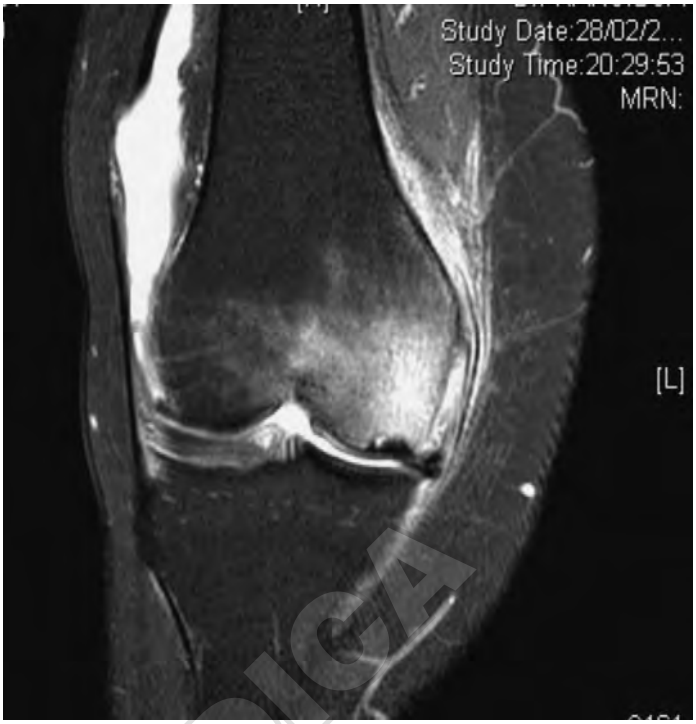

Figure 4.—Coronal T2-weighted magnetic resonance image (MRI) in our patient, demonstrating an osteochondral lesion (16 mm) in the loading area of medial femoral condyle; hyperintense associated with ill-defined in the adjacent bone marrow, compatible with Osteonecrosis of the internal femoral condyle.

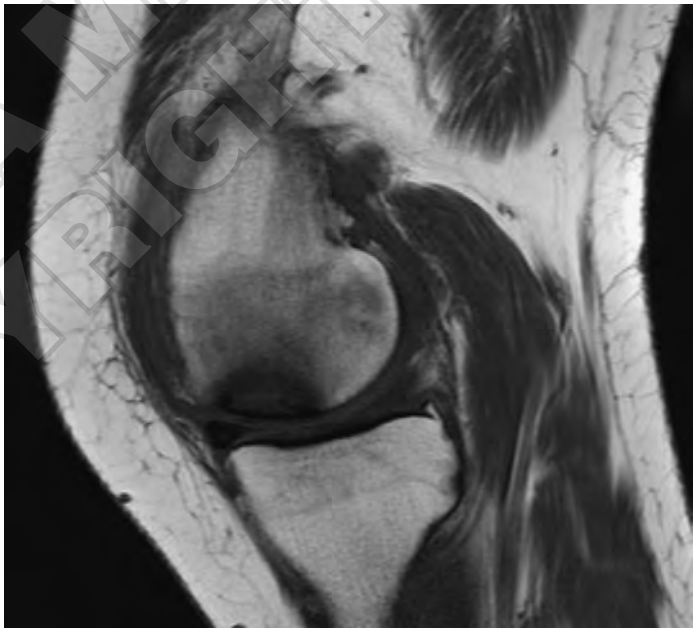

Figure 5.—Sagittal T1-weighted MRI in our patient. We can see an osteochondral lesion: an area of low signal intensity (hyposignal), corresponding to Osteonecrosis of the femoral condyle.

Due to this situation, as she was in an early stage of SONK (Stage 2 in Koshino´s classification), we chose a conservative treatment: Partial discharge with crutches, Anti-inflammatory drugs (NSAIDs), Bisphosphonates (BP), and therapeutic exercise was prescribed. Three months later, the patient had mild pain (VAS: 2), walked with a cane, and control RX showed no change.

DISCUSSION

SONK is a localized bone disorder that mainly affects the medial femur condyle of elderly women. It´s aetiology is still not fully

understood, and it´s pathogenesis is considered to be multifactorial; but cortical bone, and consequently cartilage nourishment, as well as micro-fractures, play an important role[1].

One recent study using high-resolution quantitative computed tomography revealed that osteopenia and osteoporosis could be detected in two-thirds of patients with SONK diagnosed by MRI. These observations suggest that some cases of SONK are induced by subchondral insufficiency fracture that may be associated with an underlying low bone mineral density (BMD). The incidence of SONK is more common in women, and most of the patients are over 60 years of age. A proportion of women older than 60 years have low BMD, that progresses rapidly after menopause. Therefore, investigation of women older than 60´s may be useful in clarifying the pathogenesis of SONK[10].

MRI is essential to the suspicion of a medial process of early stage osteonecrosis, not being evidential pathology by plain radiography. SONK tends to progress to more advanced disease that requires surgical intervention, and early diagnosis is important[8].

SONK treatment has been a controversial issue that has arisen along history. The persistence and severity of symptoms also have prognostic significance, that´s why early diagnosis and treatment appear to be favourable. There are a lot of operative and non-operative treatment options described in the literature for SONK. Whereas the latter stages are preferentially treated by different surgical concepts, non-operative strategies compete against operative treatment options for the early stages[1].

More conservative surgical techniques fail to improve the process of necrosis when on stage evolved. Only valgus osteotomy is a reasonable alternative. Results improve when the osteotomy is accompanied by arthrotomy and resection/grafting. In contrast, treatment with curettage and drillings by arthroscopy (which was used by a lot of authors in an attempt to revascularize the necrotic area), has lost credibility in recent years.

The value of the unicameral prosthesis remains controversial. The resurgence of interest is based on the encouraging reports from specialized centers of Europe, who continue to defend its use in selected cases of unicompartmental involvement (preferably younger cases and limited osteoarthritis)[11].

CONCLUSIONS

Osteonecrosis in patients over 60 years with osteoporosis and osteoarthritis, even without a clear history of trauma, should be suspected and treated early, in attempt to postpone or avoid knee replacement.

Treatment results and progression of SONK are still hard to predict. NSAIDs and partial weight bearing used to be the non-operative concept for many years. This unspecific and symptomatic treatment is unfortunately often characterized by a long-treatment period and unpredictable outcome; and is, therefore, frustrating to patients and therapists in many cases[1].

Bisphosphonates (BP) have recently become an attractive alternative for conservative treatment of localized bone disorders (due to their potential of regulating bone metabolism). Published results of the use BP in these patients are very promising, in regards to pain reduction and improvement of MRI findings[12].

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Evaluation of extracorporal shock wave therapy (ESWT) IN the treatment of chronic epicondylitis

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Lateral epicondilitys (LE) is a common cause of elbow pain in the adult population.

It is an overuse type of injury pertaining to the common extensor tendon of the dominant upper extremity. Repetitive wrist dorsiflexion with supination and pronation causes overuse of the extensor tendons of the forearm and subsequent microtears, collagen degeneration and fibroblastic proliferation.

The diagnosis is generally clinical. However, in patients with persistent findings despite treatment or in patients who are planned to undergo surgery, imaging might be necessary.

The treatment is mainly conservative, including education and ergonomic advice of the workplace, antiinflamatory drugs, physiotherapy, orthoses and local corticosteroid injections. Extracorporeal shock wave therapy (ESWT) can be an alternative method for patients who don't benefit from conservative treatment, before using another treatment more invasive such as surgery [1,2].

In the published bibliography, we found conflicting results on its effectiveness in the management of tennis elbow [3], so the aim of this study is to evaluate the effect of ESWT in the treatment of chronic LE.

MATERIAL AND METHODS

A retrospective review of patients who underwent consecutive ESWT between January 2009 and December 2011 was performed.

13 patients were treated in the Department of Physical Medicine and Rehabilitation of the Complexo Hospitalario Universitario A Coruña. The inclusion criteria were: patients with clinical signs and symptoms of LE for at least 6 months before treatment. The exclusion criteria were: previous surgery, failure of previous treatment with ESWT, fractures, pregnancy and bleeding disorder.

A piezoelectric extracorporeal shock wave generator (Piezoson 100) was used. All patients were placed in the prone position, and ultrasound gel was used in the ultrasound transducer. The transducer was placed over the elbow, in the origin of the muscle, and the point of maximum pain was located by physical examination. The protocol of treatment used in our unit consists in course of three sessions. Once a week, 1500 impulses (2 Hz) were applied, with average energy intensity of 0.26 mJ/mm2 (Figure 1). These patients were evaluated prospectively Visual Analogue Scale (VAS) and Roles and Maudsley Score were used to compare pain and functional status respectively, before and after completing the therapy at three months after treatment (Table 1).

All analyses were performed using SPSS 19.0 statistical software.

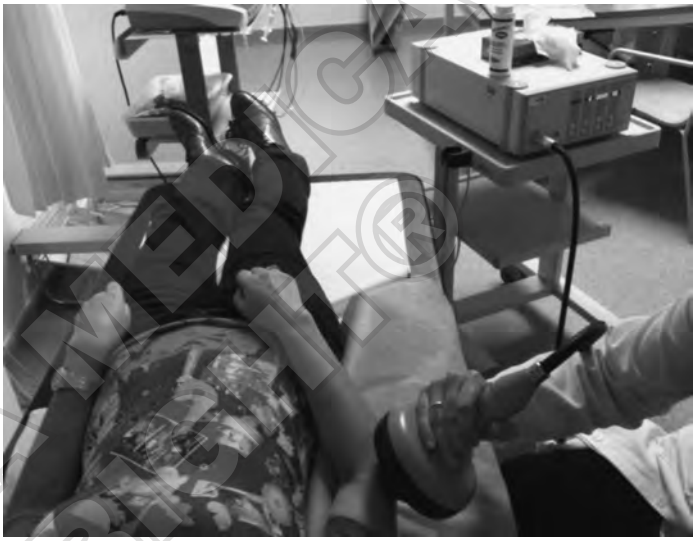

Figure 1.—ESWT technique.

Table 1.—*Roles and Maudsley Score [6]*

1. Excellent	No pain, no restriction for movement and activity
2. Good	Occasional pain, no restriction for movement and activity
3. Fair	With pain during rest and exertion and loading
4. Poor	Daily activities limited by pain

RESULTS

19 patients completed the treatment. Of those, 13 were women (68.4%) and 6 men (31.6%). Mean age was 47 years (range, 38-60 years).

The affected side was predominantly the right (78.9%).

6 patients (31.6%) were diagnosed clinically. The rest of patients had some imaging tests (52.6% of cases, ultrasound).

The mean evolution time was 22.2±16.7 months (range, 6-60 months).

18 patients received some previous treatment: pharmacological treatment (97.7%), physiotherapy (73.7%), local corticosteroid injections (68.4%), orthoses (21.1%)

Only 2 patients presented some complication after the treatment with ESWT: 1 patient presented a local hematoma, and another patient presented syncope.

4 patients (21.1%) needed a reduction of dosage because of intolerance.

Mean VAS score before treatment was 6.7, and 3 months after treatment was 3.7. So, 3 months after treatment, the percentage decrease of pain intensity was 46.7%.

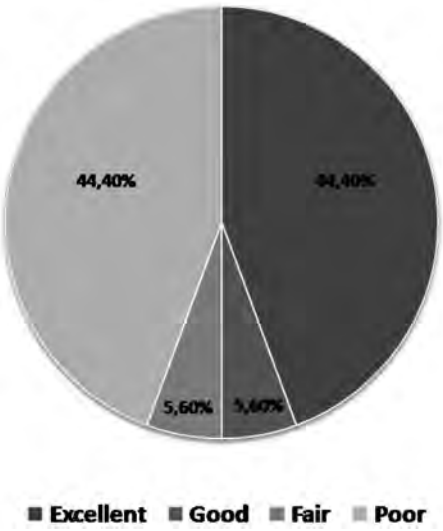

Figure 2.—Results in Roles and Maudsley Scoring.

After treatment, according Roles and Maudsley Score, 44.4% of patients were rated excellent and 44.4% were rated poor (Figure 2).

DISCUSSION

ESWT is a relatively new treatment recently introduced for managing common tendon problems such as tennis elbow with the aim to produce analgesia. This is a noninvasive procedure that uses single pulsed acoustic or sonic waves generated outside the body and focused at a specific site within the body. The shock waves dissipate energy at the interface of 2 substances with different acoustic impedance, such as the bone-tendon interface, resulting in the release of kinetic energy at the junctions that can cause tissue alterations. It has been hypothesized that ESWT works by stimulating nerve fibers to produce analgesia and that disruption of the tendon tissue may induce a healing process [3,4].

One handicap of the ESWT treatment is that there is no consensus in the dosage. In our study, 1500 impulses (2 Hz) were applied, with average energy intensity of 0.26 mJ/mm2, once a week for 3 sessions, without any local anesthesia.

This technique have been shown to improve the intensity of pain in chronic LE in several studies [1,3]. In our study, both VAS and Roles and Maudsley scores improved after treatment.

Treating our patients with this technique, we didn't observe significant complications, in according with other publications [5].

Systematic reviews that had evaluated the effectiveness and safety of ESWT in the treatment of LE existed with conflicting results in the literature: in some studies, this treatment has been found favorable [4]; on the contrary, some other studies did not find ESWT better than placebo [6].

In summary, we observed that there was improvement in pain and function measures in the short term (3 months) after ESWT treatment, without adverse events due to the technique or side effects. But the present study has several limitations, as the short number of patients, the short follow-up and the absence of a control group.

CONCLUSIONS

ESWT has been shown to be an effective and safe therapeutic option in patients with chronic epicondylitis refractory to other treatments.

There are differences in results between different trials. This could be because there is no consensus on treatment parameters.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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Fratture da fragilità osteoporotiche estremo prossimale di femore: studio osservazionale in un reparto di ortopedia e traumatologia con la collaborazione della fisiatria

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Negli ultimi 30 anni le fratture di femore da fragilità ossea nel mondo sono state 1,6 milioni. Aggiornando questo dato alle proiezioni dell'invecchiamento della popolazione, nel 2050 le fratture diventeranno 2,26 milioni, raddoppiando nell'arco di 50 anni in Europa, fino a superare i 970.000 casi. È noto come un paziente che abbia avuto una frattura femorale da fragilità, presenti un rischio elevato di andare incontro a nuove fratture, in assenza di un'adeguata terapia medica anti-riassorbitiva o osteoformativa con l'associazione di ca e vit D e di un personalizzato trattamento riabilitativo per il recupero della disabilità ed il miglioramento delle abilità residue. Tuttavia, a fronte di evidenze scientifiche che suggeriscono di instaurare una strategia di prevenzione secondaria e alla disponibilità di farmaci efficaci e sicuri, la letteratura sembra indicare che ciò accade molto raramente. Scopo principale del presente studio è stato quello di verificare, nel territorio della Locride in che misura nei pazienti anziani fragili ricoverati in ospedale per frattura da fragilità osteoporotica di femore, era stata prescritta una appropriata terapia antiosteoporotica prima dell'evento acuto, e se tale atto abbia portato miglioramenti nella qualità della vita dopo la dimissione dal reparto per acuti.

MATERIALI E METODI

È stato condotto, dai Fisiatri uno studio osservazionale presso l' U.O.C. di Ortopedia e Traumatologia dell'Ospedale di Locri ASP Reggio Calabria nel periodo Gennaio 2010 Dicembre 2011 su una serie consecutiva di pazienti ricoverati per frattura del collo del femore. Criteri di inclusione: pazienti ricoverati per frattura estremo prossimale femore. Criteri di esclusione: soggetti giovani di età inferiore a 60 anni o affetti da patologie note dello scheletro, soggetti non collaboranti. Quindi la valutazione è stata effettuata mediante la raccolta di dati demografici e anamnestici, focalizzati principalmente sulla valutazione dei fattori di rischio e/o della pregressa diagnosi di osteoporosi, la presenza di pregresse fratture, sull'eziologia del trauma (a bassa energia tipica delle fratture da fragilità) e sull'eventuale terapia in atto prima dell'evento fratturativo, per mezzo di una scheda disegnata e testata in precedenza che pianificava anche, tramite delle interviste telefoniche, lo stato di salute dei pazienti a tempi prestabiliti dalla dimissione.

RISULTATI

Lo studio ha incluso un totale di 400 pazienti: di ambo i sessi. Il 43% di età compresa tra gli 70 e gli 80 anni; Il 67% era di età superiore agli 80 anni. Nei 74% dei casi la frattura era secondaria a trauma a bassa energia e nel 42% dei pazienti, la diagnosi di osteoporosi era precedente all'evento traumatico. Un dato degno di nota è che il 30% dei pazienti aveva una anamnesi positiva per frattura da fragilità ed in particolare, che il 5% aveva subito una pregressa frattura di femore.

Al momento del ricovero, solo una parte minima di pazienti stava assumendo farmaci per l'osteoporosi e/o supplementi di calcio e vitamina D, mentre nella maggior parte dei casi non era stata iniziata alcuna terapia. Alla dimissione, l'80% dei pazienti ha ricevuto prescrizione di terapia medica antiriassorbitiva o osteoformativa.

CONCLUSIONI

Pur in presenza di chiare indicazioni basate su solide prove scientifiche, i dati riportati confermano che l'osteoporosi è attualmente una patologia sottostimata.

Il ruolo dell'ortopedico sappiamo tutti essere quello di trattare l'emergenza in sé, più spesso con l'intervento chirurgico, ma con l'aiuto di altri specialisti, come il Fisiatra, potrebbe migliorare la gestione del paziente con osteoporosi, che ha rappresentato il substrato patologico per la frattura.

Nella gestione del paziente anziano con frattura di femore da fragilità appare invece importante che lo specialista instauri prima della dimissione una progetto- programma riabilitativo tendente a ridurre la disabilità ed una giusta terapia medica con farmaci antiriassorbitivi o osteoformativi associata a supplementazione di calcio e Vi. D che abbiano dimostrato di ridurre in modo significativo il rischio di frattura.

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Chronic benign pain and associated conditions in Italian breast cancer survivors

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Chronic benign pain (1) is one of the most frequent impairment occurring in breast cancer survivors and it is frequently associated to endocrine therapy (aromatase inhibitors and tamoxifen), postmenopausal syndrome, upper limb lymphedema, and an unsatisfactory Health Related Quality of Life (HRQoL). The aim of our observational study was to evaluate the prevalence of chronic benign pain in a breast cancer patients population attending an outpatient oncologic rehabilitation center and particularly to investigate about women suffering mixed chronic bening mild or moderate pain and consuming tapentadol (2) to control pain symptoms.

MATERIALS AND METHODS

From 1st January 2012 to 31st May 2012 two hundred and thirty six breast cancer desease free women underwent examination in our outpatient oncologic rehabilitation center and gave their free and informed written consent to their clinical and demographic data use for the study. We evaluated the percentage of women suffering from chronic benign pain and studied in particular those treated with tapentadol from more than 1 month. In this group we collected the following data: age, weight and height to calculate BMI, presence or absence of upper limb secondary lymphedema diagnosed according to the 2009 Consensus Document of International Society of Lymphology (3), treatment or not treatment with Endocrine Therapy (aromatase inhibitors and tamoxifen), menopausal status, perceived HRQoL evaluated by SF12 (4,5), pain intensity assessed by Visual Analogue Scale (VAS) (6) at the time of analgesic therapy starting. Furthermore we calculated the different percentage of patients taking different endocrine drugs (letrozole, anastrazole, exemestane, tamoxifen) and the percentage of patients taking different doses of tapentadol.

RESULTS

One hundred and forty four patients suffered from chronic benign pain, four women suffered from malignant pain and one hundred and eightyeight dind't have pain. Seventynine women took tapentadol. The results about the tapentadol group were: the average age of patients was 62 years (min 40, max 85), the average BMI was 30 (min 19-max 44), 60.76 % of patients were affected by lymphedema, 68.35% of women underwent endocrine therapy (Tamoxifen 30.38%, Letrozole 32.91%, Anastrazole 27.85%, Exemestane 7.59%, not remember 1.27%) and 98.73% were in menopause (Table I). The results concerning the quality of life and pain intensity in Tapentadol group were: mean SF-12 PCS was 33.37 (SD 9.76) and mean MCS was 40.43 (SD 13.81), mean pain intensity at the first clinical evaluation was 5.1 (SD 1.12)(Table II) and the 63.29% of our sample used tapentadol 50mg twice a day, the 35.44% used 100mg twice a day and only one patient used 150mg twice a day (Table I).

Table I.—*Tapentadol consuming group (79 patients).*

	Patients %	Average (min-max)
Age		62 (40-85)
BMI		30 (19-44)
Menopause	98.73	
Lymphedema	60.76	
Tamoxifen	30.38	
Letrozole	32.91	
Anastrazole	27.85	
Exemestane	7.59	
Not remember	1.27	
Tapentadol 50mg twicw	63.29	
Tapentadol 100mg twicw	35.44	
Tapentadol 150mg twicw	0.79	

Table II.—*SF 12 scores and Pain Intensity by VAS.*

	Mean (SD)
PCS	33.3 7 (9.76)
MCS	40.43 (13,81)
VAS	5.1 (1.12)

DISCUSSION

In our population of breast cancer disease-free phase women chronic benign pain is really present, it is often moderate rather than mild and needs a long-term treatment. Pain suffering women are often overweight, in menopause, are undergoing endocrine therapy and are affected by lymphedema. Tapentadol is well accepted as a long-term pain treatment for a considerable number of patients but despite the pharmacological treatment, already in progress, the patients HRQoL evaluated by SF12 appears unsatisfactory especially in the physical components scores. Our study is not exhaustive about the determinants of pain and the pain trend over time, but we arise the question that probably to maximize the effectiveness of drug therapy is need a better assessment and a global care of cancer people.

CONCLUSIONS

Our data suggest that chronic benign pain conditions are frequent in breast cancer population but its treatment is almost always based on drugs consumption although many recent literature data support the relevance of a comprehensive approach such as that rehabilitation. We support the idea that all future cancer patients can undergo a global rehabilitation examination paying attention to evaluate chronic pain, its determinants and underlying conditions that may affect it and have access to comprehensive treatment programs.

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Polimorfismo genetico ed outcome riabilitativo in pazienti ospedalizzati con ictus ischemico: ruolo dell'Apolipoproteina E4

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Tra le gravi cerebro-lesioni, l'ictus rappresenta una delle principali cause di morte e disabilità. L'ictus ischemico, in particolare, è una malattia multifattoriale, nella quale, in aggiunta a fattori di rischio convenzionali, come ipertensione, diabete mellito e fumo, studi di evidenza clinici ed epidemiologici, hanno ripetutamente supportato un contributo genetico alla suscettibilità comune dell'ictus. Parecchi "candidate genes" sono stati collegati al rischio di ictus, tuttavia è improbabile che un singolo gene comune possa giocare un ruolo maggiore nella patogenesi dell'ictus. Studi epidemiologici su persone giovani e di media età hanno mostrato che il rischio di malattie cerebrovascolari è più alto nelle persone che presentano l'allele APO Eε_4 e più basso in quelle che presentano un allele APO E ε2. Funzionalmente, gli alleli APO E e i genotipi influenzano il profilo lipidico, come evidenziato dall'associazione degli alleli APOE ε2 con i livelli più bassi di colesterolo totale e degli alleli ε_4 con i livelli più alti di colesterolo e i livelli di colesterolo – LDL a bassa densità. Tuttavia, oltre che sull'eziopatogenesi dell'ictus, l'APO-E sembra avere un ruolo rilevante anche nel predire l'outcome funzionale dei pazienti con ictus ischemico. Pochi e discordanti sono i dati che si posseggono in letteratura circa il recupero funzionale dei pazienti con APO-E ε_4 con ictus ischemico sottoposti a trattamento riabilitativo. Se da un lato infatti alcuni studi hanno riportato che vi sia un buon recupero funzionale alla dimissione e al follow-up nei pazienti con ictus ischemico sottoposti a trattamento riabilitativo [1], altri studi hanno mostrato risultati meno soddisfacenti, che evidenziavano al contrario severa disabilità[3].

Pochi sono anche i dati di letteratura che si posseggono circa il recupero cognitivo degli stessi pazienti [1,4,6].

Pertanto abbiamo effettuato uno studio con le seguenti finalità: determinare il ruolo dell'allele APO-E ε_4 sul recupero motorio e cognitivo a lungo termine dei pazienti con ictus ischemico tra i sessanta e gli ottanta anni e sottoposti a trattamento riabilitativo e valutare in tal modo gli effetti che tale apolipoproteina ha sull'outcome, così da determinare il percorso assistenziale riabilitativo dei pazienti stessi.

MATERIALE E METODI

Si tratta di uno studio longitudinale prospettico con valutazione al baseline e finale e studio di follow up a 6 mesi. È stato coordinato dalla Divisione di Medicina Fisica e Riabilitativa dell'Università degli Studi di Foggia e dalla divisione di Medicina Fisica e Riabilitativa della Fondazione Don Gnocchi di Acerenza (PZ) e di Tricarico (MT) ed è stato eseguito presso le stesse Divisioni.

Dopo Consenso informato ed approvazione del Comitato Etico, sono stati individuati tutti i pazienti colpiti per la prima volta da ictus ischemico, nel periodo temporale compreso tra aprile 2010 ed aprile 2012. I criteri di inclusione comprendevano: pazienti dell'età ≥60 anni e ≤80 anni; pazienti con presenza o assenza di emiplegia, neglect, afasia. I pazienti con ictus emorragico o eventi ictali precedenti sono stati esclusi dallo studio. Sono stati esclusi dallo studio, inoltre, i pazienti con altre patologie neuromuscolari ed ortopediche e quelli con condizioni mediche o psichiatriche serie o instabili che avrebbero potuto compromettere la positiva partecipazione del paziente allo studio. Prima della visita di screening, tutti i pazienti sono stati sottoposti a procedure di Brain Imaging, Tomografia computerizzata o Risonanza Magnetica per individuare la sede precisa del danno cerebrale. I pazienti sono stati raggruppati in base al lato del deficit neurologico (emisindrome destra o sinistra) e in base alla principale sindrome clinica (presenza o assenza del neglect o sindrome afasica). Per tutti i pazienti è stato analizzato inoltre il percorso assistenziale e il tipo di setting riabilitativo cui sono stati avviati. Tutti quelli che sono stati ricoverati in Riabilitazione sono stati sottoposti a valutazione funzionale mediante l'utilizzo della scala FIM, per valutare la disabilità, e l'utilizzo del Protocollo di Minima, comprendente le scale: Barthel Index, VAS, Scala Rankin modificata, Trunk Control test, Motricity Index, Canadian Neurological Scale, Scala Ashworth, MMSE, FAQ, Nine Hole Peg Test all'ingresso, alla dimissione e al follow up.

Per le scale somministrate al follow up, il questionario è stato somministrato telefonicamente nei pazienti sopravvissuti che non si sono sottoposti a visita. Durante l'ospedalizzazione, tutti i pazienti sono stati trattati in modo intensivo per non meno di 3 ore al giorno, per 5 giorni alla settimana, da un team di riabilitazione neurologica formato da fisiatra, fisioterapista, logopedista.

ANALISI GENETICA

Campioni di sangue venoso sono stati presi a digiuno per la valutazione della routine di laboratorio. Il DNA genomico totale è stato isolato in interfase ricca di leucociti su di uno strato di sangue anticoagulato con EDTA attraverso il metodo fenolo – cloroformio, disciolto in acqua nucleasi free e conservato in congelatore a -20° C in attesa di test. La genotipizzazione dell'APO E è stata fatta dall'analisi del polimorfismo sulla larghezza del frammento attra-

verso la Polimerasi Chain Reaction – restrittiva, usando CFOI. I prodotti di digestione con PCR sono stati messi in elettroforesi su 5% di gel di agarosio Nusieve. I controlli sono stati trovati essere in equilibrio di HArdy- Weinberg. Il personale che eseguiva i test non era consapevole dei risultati della riabilitazione.

Analisi statistica

I pazienti sono stati divisi in gruppi all'ingresso in base ai pazienti che possedevano l'allele APO-Eε_4 e a quelli che non lo possedevano, in base alla disabilità, come stimato dalla scala FIM e in base alla presenza o assenza del neglect e dell'afasia.

I dati sono stati presentati come misure +SD. I metodi statistici sono stati inclusi nell'analisi della varianza, nella correlazione di Pearson, nell'analisi della regressione lineare multivariata, il test Student a due code e il t-test accoppiato.

Trattamento riabilitativo:

Tutti i pazienti sono stati sottoposti a trattamento riabilitativo della durata di 3 ore al giorno per due mesi circa, presso strutture di riabilitazione a carattere intensivo. A tutti i pazienti sono stati effettuati esercizi di mobilizzazioni articolari segmentarie ai 4 arti, esercizi di mobilizzazione passiva ed attiva facilitata ai 4 arti con facilitazioni propriocettive neuromuscolari, esercizi di stretching, flessibilità, esercizi di rinforzo muscolare, controllo posturale con cambi di posizione secondo necessità, terapia logopedica, prevenzione delle piaghe da decubito, standing e deambulazione assistita, esercizi di equilibrio. È stata eseguita inoltre terapia fisica strumentale consistente in elettrostimolazione ai muscoli quadricipiti femorali e glutei.

RISULTATI

Sono stati studiati 170 soggetti. 29 di essi (19 M,10 F, età media 70 anni) sono stati inseriti nello studio. Tutti i soggetti erano pazienti ospedalizzati colpiti per la prima volta da ictus ischemico. Tutti i pazienti sono stati ricoverati in una struttura riabilitativa a carattere intensivo o neuro-riabilitativo. Dall'analisi del Dna genomico e' emerso che 3 pazienti, tutti di sesso maschile, avevano l'allele Apo E ε4 nella forma ε3-ε4, 6 pazienti (4 M,2F) avevano la forma ε2-ε3, mentre 20 pazienti (12 M,8 F) avevano la forma ε3-ε3, quindi erano senza l'allele specifico. Al momento dell'ingresso in riabilitazione, dei pazienti con l'allele Apo Eε4, 1 paziente aveva un'emiplegia destra, 1 aveva un'emiparesi destra, 1 un'emiparesi flaccida sinistra. Dei pazienti con l'allele Apo Eε4, inoltre, 1 paziente aveva afasia, in prevalenza motoria. Nessun paziente presentava neglect. Alla dimissione, dopo il trattamento riabilitativo, la maggior parte dei pazienti con APo-Eε4, come quelli senza APo-Eε4, ha presentato un buon recupero motorio, che permane o aumenta ulteriormente al follow-up a sei mesi. Per quanto concerne la disabilità, i valori medi della scala FIM nei pazienti con APo-Eε4 all'ingresso, alla dimissione e al follow-up sono risultati rispettivamente,39.3 (±10.8), 71 (±8.6), 73 (±8.6). I valori medi della scala VAS del dolore sono risultati, rispettivamente, 1.3 (±1.8), 0.6 (±0.9) e 0 all'ingresso, alla dimissione e al follow-up. Le funzioni delle ADL, misurate con la scala Barthel, sono risultati essere, rispettivamente, 21.6 (±8.5), 53.3 (±1.7) all'ingresso, alla dimissione e uguale alla dimissione al follow-up; i valori della FAQ, indicanti la deambulazione, 0 all'ingresso, 2 alla dimissione, 2 al follow-up. I valori della mRS rispettivamente, 4 all'ingresso, 2.6 alla dimissione (±0.5) alla dimissione, 2.6 (±0.5) al follow-up. La performance motoria dopo l'ictus valutata con il trunk control test è risultata essere: 61 (±18.4) all'ingresso, 57 (±21.7) alla dimissione, 61 (±18.3) al follow-up. I valori medi della motricity index sono risultati essere 56.6 (±23.1) all'ingresso,86 (±22.9) alla dimissione e 90 (±23.2) al follow-up. Il deficit fisico, valutato con la Canadian Neurological Scale ha mostrato i seguenti valori 5.3 (±1.7) all'ingresso, 6.6 (±1.2) alla dimissione e 7.3 (±0.5) al follow-up. I valori medi della Ashworth per la spasticità sono risultati essere 0 all'ingresso,0 alla dimissione, 0 al follow-up. I valori medi della NHPT, che esamina la manualità fine, sono risultati essere, rispettivamente 4.35 all'ingresso, 4.47 alla dimissione e 3.42 al follow-up (Graph I). Per quanto concerne l'afasia, al contrario, si è evidenziato che uno su tre dei pazienti con allele ε4 presentava afasia, prevalentemente motoria, e che questa migliorava dopo trattamento riabilitativo. 6 pazienti presentavano l'allele ε2-ε3. Tre di essi avevano afasia. Nessuno di loro presentava neglect. Nei pazienti con APO E ε2-ε3 si osserva come per i pazienti con APO Eε4 un miglioramento alla dimissione dal punto di vista motorio, che aumenta ulteriormente al follow-up. Infatti i valori medi delle scale di valutazione sono stati: scala FIM: 38.5 (±7.8) all'ingresso, 73.6 (±20.5) alla dimissione, 84.1 (±16.8) al follow-up; per la scala VAS: 0 all'ingresso, 1.3 (±2.9) alla dimissione, 0.8 (±1.8) al follow-up; per la scala Barthel: 16.6 (±5.5) all'ingresso, 45.8 (±19) alla dimissione, 64.1 (±23.1) al follow-up; per la scala FAQ: 0.2 (±0.4) all'ingresso, 1.8 (±1.2) alla dimissione, 1.8 (±1) al follow-up; per la scala mRS: 4 all'ingresso, 2.6 (±0.7) alla dimissione, 2.6 (±0.9) alla dimissione; per il trunk control test: 16 (±11.3) all'ingresso, 16 (±11.3) alla dimissione, 59 (±20.2) al follow-up; per la motricity index: 48 (±25.6) all'ingresso, 101.1 (±22.5) alla dimissione,110 (±22.6) al follow-up. Per la Canadian N. S.: all'ingresso 4 (±0.8), alla dimissione 5.2 (±1.5), al follow-up 5.6 (±1.3). Per la Ashworth: all'ingresso 0.5 (±0.7), alla dimissione 0.3 (±0.5), uguale al follow-up. Per il NHPT: all'ingresso 1.12, alla dimissione 0.6, al follow-up 0.5 (Graph II). I 20 pazienti restanti (12 M,8F) posseggono l'allele APO E ε3-ε3. Cinque di essi avevano afasia, prevalentemente motoria. Nessuno di essi aveva neglect. Dal punto di vista motorio si osserva anche in questo caso un miglioramento alla dimissione e al follow-up a sei mesi. Infatti le scale di valutazione effettuate hanno dato i seguenti risultati: scala FIM: 50.4 (±15.7) all'ingresso, 83.6 (±22.5) alla dimissione, 95 (±20.3) al follow-up; scala VAS: 2 (±2.9) all'ingresso, 1.65 (±2.1) alla dimissione, 1.05 (±1.6) al follow-up; scala Barthel: 26.5(±12.8) all'ingresso, 57.5 (±19.8) alla dimissione, 67 (±18.8) al follow-up; scala FAQ: 0.2 (±0.6) all'ingresso, 2.5 (±1.5) alla dimissione, 2.4 (±1.5) al follow-up; scala mRS: 3.8 (±0.6) all'ingresso, 2.5 (±0.7) alla dimissione, 2.4 (±0.8) al follow-up; il trunk control test: 27.6 (±13.2) all'ingresso, 65.1(±20.3) alla dimissione, 69.6 (±23.7) al follow-up; la motricity index: 70.8 (±20.5) all'ingresso, 112.3 (±34.2) alla dimissione, 121.6 (±37.2) al follow-up; la Canadian N. S.: 6.2 (±1.6)

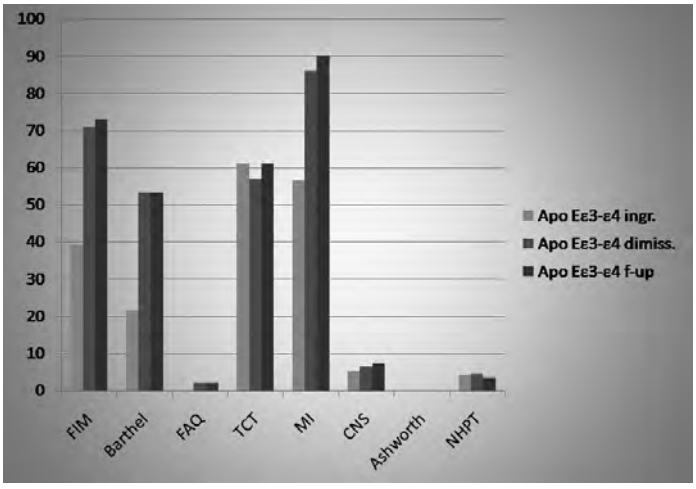

Figure 1.—Valori delle principali scale del Protocollo di Minima in pz con Apo Eε3-ε4 all'ingresso, alla dimissione e al follow-up a 6 mesi.

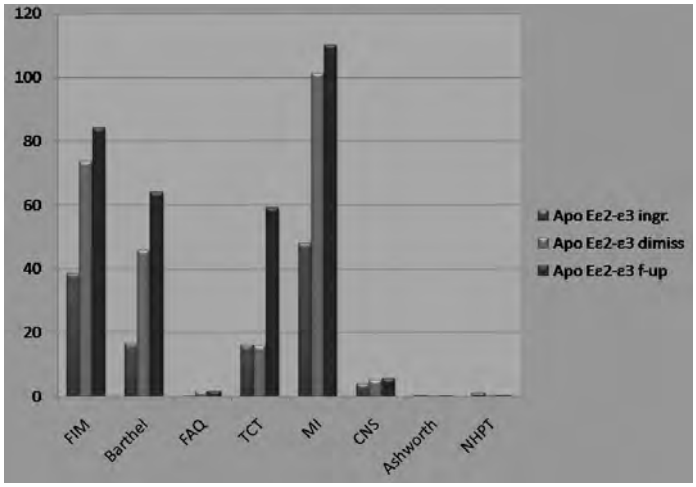

Figure 2.—Valori delle principali scale del Protocollo di Minima in pz con Apo Eε2-ε3 all'ingresso, alla dimissione e al follow-up a 6 mesi.

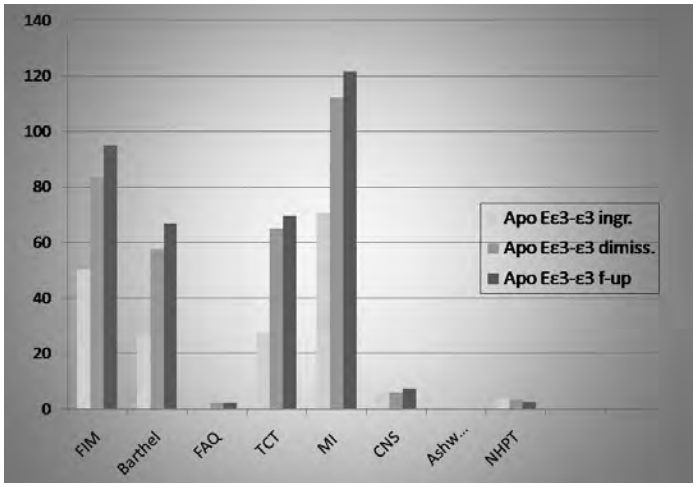

Figure 3.—Valori delle principali scale del Protocollo di Minima in pz con Apo Eε3-ε3 all'ingresso, alla dimissione al follow-up a 6 mesi.

all' ingresso, 6.2 (±1.6) alla dimissione, 7.6 (±2.2) al follow-up; la scala Ashworth: 0.05 (±0.2) all'ingresso, 0.05 (±0.2) alla dimissione, 0.05 (±0.2) al follow-up; il NHPT: 3.9 all'ingresso, 3.5 alla dimissione, 2.6 al follow-up (Graph III). Dai valori risultati dalla valutazione mediante scala MMSE, inoltre, si è evidenziato, come, al contrario di quanto avviene per l'aspetto delle abilità motorie dei pazienti, per quanto riguarda le funzioni cognitive, vi è invece un declino nei pazienti con Apo-Eε4 rispetto ai pazienti senza l'allele e questo in particolare nei processi di apprendimento verbale e nella memoria, benché vi sia un miglioramento delle funzioni cognitive nei pazienti con ictus dell'emisfero sinistro rispetto ai pazienti con ictus dell'emisfero destro. Nei pazienti con Apo Eε2-ε3 c'è infatti un miglioramento sia alla dimissione che al follow-up dal punto di vista cognitivo, mentre in quelli con APO Eε3-ε3, in 6 di essi si osserva stazionarietà, nei restanti un miglioramento alla dimissione che persiste al follow-up. I valori della scala MMSE nei pazienti con APO E ε3-ε4 sono risultati essere, infatti: 22 (±1) all'ingresso, 18.5 (±0.5) alla dimissione, 18.5 (±0.5) al follow-up; nei pazienti con APO E ε2-ε3: 17.2 (±5.2) all'ingresso, 21.2 (±3.1) alla dimissione, 22.04 (±2.5) al follow-up; nei pazienti con APO E ε3-ε3: 24.8 (±2.4) all'ingresso, 25.9 (±2.6) alla dimissione, 26.5 (±2.6) al follow-up (Graph IV).

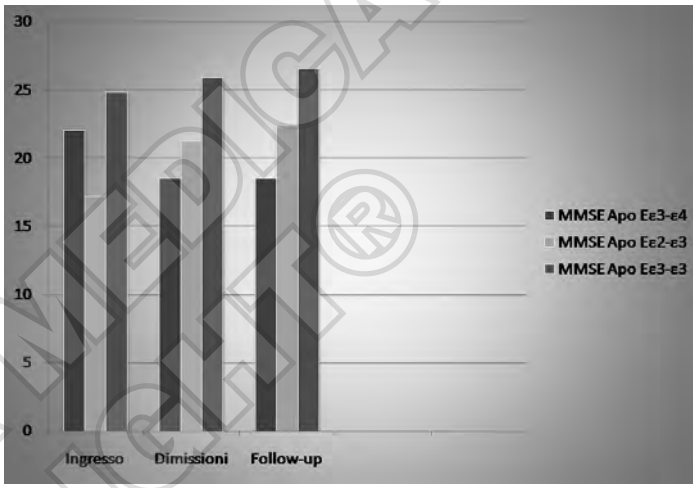

Figure 4.—Confronto dei valori dell'MMSE in pz con Apo Eε3-ε4, con Apo Eε2-ε3 e con Apo Eε3-ε3 all'ingresso, alla dimissione e al follow-up a 6 mesi.

DISCUSSIONE

I pazienti con APO $E\varepsilon_4$ tra i sessanta e gli ottanta anni con un primo episodio di ictus ischemico, sottoposti a trattamento riabilitativo di tipo intensivo presentano alla dimissione un buon recupero funzionale, che permane o aumenta ulteriormente al follow – up a sei mesi, così come per i pazienti senza APO Eε4. A differenza di questi ultimi, tuttavia, nei pazienti con APO Eε4, si assiste ad un declino cognitivo, in particolare nei processi di apprendimento verbale e nella memoria. La presenza dell'allele APO $E\varepsilon_4$ è correlata inoltre con lo sviluppo di afasia, prevalentemente motoria, che migliora in seguito a trattamento riabilitativo.

Il ruolo dell'Apolipoproteina $E\varepsilon_4$ nei pazienti con ictus ischemico è al centro di un largo numero di studi di ricerca da molti anni. Nonostante le numerose segnalazioni, i risultati riguardanti la mortalità e l'outcome sono molto diversi tra loro e spesso contraddittori, tanto che il ruolo che l'Apolipoproteina $E\varepsilon_4$ ha sull'outcome funzionale dei pazienti con ictus ischemico è ancora oggetto di discussione e di dubbi. Il nostro studio ha mostrato che buona parte dei soggetti tra i sessanta e gli ottanta anni con un primo episodio di ictus ischemico raggiunge un buon recupero funzionale alla dimissione da un reparto di riabilitazione di tipo intensivo e che questo aumenta ulteriormente al follow – up. Il confronto con gli studi precedenti non è agevole per una serie di motivi, quali la metodologia impiegata, la tipologia di pazienti arruolati, gli strumenti di valutazione ed il periodo di follow – up. Molti studi hanno considerato il ruolo dell'APO E sulla causa dell'ictus, come lo studio di Mc Carron, anziché sull'outcome, mentre di quelli che hanno studiato l'outcome, alcuni hanno preso in esame solo l'ictus emorragico, come quello di Alberts, altri il trauma cranico, come Mayeux e Friedman. Confrontati con queste indagini, i nostri dati sono risultati simili a quelli di Treger, che ha evidenziato come la presenza dell'APO E non determinava un outcome funzionale negativo nei pazienti con ictus ischemico, mentre era determinante nel favorire lo sviluppo di afasia negli stessi pazienti e questo in particolare nei pazienti con ictus dell'emisfero sinistro [1]. Il nostro studio è in accordo inoltre con lo studio di Wagle, che ha analizzato il recupero cognitivo dei pazienti con APO E con ictus ischemico e che ha evidenziato un significativo declino in questi pazienti, in particolare nei tests correlati all'apprendimento verbale e alla memoria (4). Naturalmente, molteplici variabili possono condizionare i risultati degli studi, come l'età, la gravità dell'ictus ischemico, il periodo di follow – up, le procedure impiegate, le comorbidità, la prosecuzione a domicilio del trattamento riabilitativo. Un fattore prognostico importante è sicuramente costituito dall'età, per cui pazienti più giovani che hanno avuto un ictus ischemico hanno una prognosi migliore sia per la mortalità che per l'outcome [2]. A riguardo, anche il nostro studio concorda con questo dato, considerato che i pazienti con outcome negativo erano più anziani, mentre i soggetti sopravvissuti

e con buon recupero funzionale erano più giovani. Generalmente, gli studi precedenti hanno utilizzato scale di valutazione funzionale poco specifiche. In nessuna ricerca precedente tra quelle che hanno preso in esame lo studio dell'APO E in pazienti con ictus ischemico è stata impiegata una batteria di scale di valutazione come quella impiegata nella presente indagine. Per quanto riguarda la scala VAS del dolore si è evidenziato che i pazienti con ictus ischemico in sede talamica avevano un punteggio più elevato e quindi un dolore maggiore (punteggio 7 all'ingresso) rispetto a coloro che avevano un ictus in altre sedi (punteggio pari a 0 – 2). Le scale da noi utilizzate tuttavia non erano esenti da limitazioni. La scala MMSE infatti si è dimostrata essere una scala che si basava essenzialmente sui deficit di memoria nella valutazione dei deficit cognitivi di questi pazienti, quando invece il deficit fondamentale soprattutto nel danno vascolare sottocorticale è la sindrome disesecutiva e le alterazioni comportamentali (sindrome fronto-sottocorticale), mentre i deficit mnesici sono circoscritti alla working memory [7]. Relativamente al recupero a lungo termine, i dati presenti in letteratura sono scarsi. Treger ha valutato un follow – up a tre mesi [1], Sarzynska e Gromadzka a un anno [2,3], Bour a due anni [6]. Il nostro studio è stato l'unico che ha valutato un follow – up a sei mesi. Nel valutare l'importanza delle comorbidità il nostro studio è in accordo con Sarzynska [2]. Il nostro studio è stato tuttavia l'unico che ha preso in esame per valutare l'outcome nel follow – up anche la prosecuzione del trattamento riabilitativo a domicilio.

I nostri risultati mostrano che i pazienti con ictus ischemico tra i sessanta e gli ottanta anni e sottoposti a trattamento riabilitativo di tipo intensivo presentano un buon recupero dal punto di vista motorio alla dimissione, che aumenta ulteriormente al follow – up. Dal punto di vista cognitivo, invece, in questi pazienti si osserva un declino, in particolare nell'apprendimento verbale e nella memoria. La spiegazione di questo dato potrebbe essere dovuta a molteplici fattori oltre all'APO E, quali il contesto familiare e sociale in cui si trova a vivere il paziente, ma soprattutto ad una certa componente depressiva che insorge nei pazienti con ictus ischemico sottocorticale. In questi pazienti, sebbene i meccanismi alla base della depressione che si osserva in concomitanza con la patologia ischemica sottocorticale non siano noti, è probabile che lesioni ischemiche interessino aree e vie nervose coinvolte nella regolazione dell'umore, in particolare il sistema limbico (8). Pertanto tale componente depressiva, se associata all'APO E, può contribuire fortemente alla riduzione della performance cognitiva dopo l'ictus e in particolare può determinare alterazioni della memoria, dell'attenzione, dell'insight, perdita del problem solving e a lungo andare all'insorgenza di demenza [9]Certo la nostra ricerca ha una serie di limitazioni, quali il numero dei pazienti studiati e la metodologia dello studio, tuttavia essa ha anche dei punti di forza, quali un periodo di follow – up né eccessivamente lungo né al contrario troppo breve e l'utilizzo di una vasta batteria di scale funzionali ben codificate e standardizzate, pur se con dei limiti. Si tratta inoltre di uno dei pochi studi che ha analizzato sia il recupero motorio che cognitivo dei pazienti con APO E con ictus ischemico. Naturalmente molti quesiti restano ancora aperti che richiedono risposte definitive, quali la correlazione tra APO E e la nascita di possibili nuovi farmaci che agiscano su questa proteina, l'individuazione di fattori prognostici, la scelta dei pazienti.

CONCLUSIONI

I pazienti con APO Eε4 tra i sessanta e gli ottanta anni con un primo episodio di ictus ischemico, sottoposti a trattamento riabilitativo di tipo intensivo e valutati con scala FIM e Protocollo di Minima, presentano alla dimissione un buon recupero motorio, che permane o migliora ulteriormente al follow-up a sei mesi, allo stesso modo dei pazienti senza APO Eε4. A differenza di questi ultimi, tuttavia, nei primi la presenza dell'APO Eε4 contribuisce a determinare declino cognitivo, in particolare nell'apprendimento verbale e nella memoria. Infine, dal nostro studio è emerso che la presenza dell'allele Apo E ε4 è correlata con lo sviluppo di afasia, prevalentemente motoria, che migliora in seguito a trattamento riabilitativo.

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Correlation between cognitive disorders and dysphagia

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Dementias, in advanced stage, can generate complications such as pneumonia and dysphagia which are common causes of death[1].

These symptoms indicate a more rapidly progressive disorders involving cortical and sub cortical structures. A retrospective study found that early predictors of mortality in patients with dementia, cognitive deficits and swallowing disorders can determine a longer survival[2].

Pneumonia, following dysphagia is the most important complication and first cause of death[3].

Therefore a complete assessment of swallowing functions can suggest a rehabilitation treatment with the purpose of modifying nutritional habits, preventing aspirations and improving prognosis. Synthetically, the aim of this study is to demonstrate a correlation between neuropsychological impairment and swallowing disorders, directed towards prevention of connected complications in patients with cognitive impairment.

MATERIALS AND METHODS

In a rehabilitation division 18 patients, with postsurgical orthopedic diagnosis, were assessed.

Neurological examination and TC scan excluded neurological diseases. The Dysphagia Outcome and Severity Scale (DOSS) [4], and Mini Mental State Examination (MMSE)[5], have been used as screening to find the presence of dysphagia and cognitive impairment.

12 patients have been enrolled and assessed with neuropsychological tests aimed to investigate attention, memory, learning and speech abilities. MISA[6] Scale and a Fiberoptic Endoscopic Examination of Swallowing (FEES) has been used to assess swallowing abilities.

Scores of neuropsychological tests have been compared with subscales of MISA, using the Spearman's Rank Correlation Coefficient.

RESULTS

Among several comparisons we found some significant correlations. Total score of MISA compared with the MMSE gave a significant result (r<=0.866). In particular we saw strong correlations between apraxia and solid ingestion/management. The same functions for liquids were strongly correlated with attentive abilities. We didn't find any strong correlations between memory and ingestion abilities.

DISCUSSION

Although the sample of patients is small, but the strength of correlations encourage to go on with this work. MISA is a scale translated into the Italian language and in course of validation in this cultural context.

The strongest correlation is between the apraxia and deglutition as well as between attentive abilities and deglutition aspects of MISA.

Langmore[1], in the almost only work about this topic, demonstrated a good correlation between swallowing disorders and frontotemporal lobar dementia (FTLD). In clinical practice this is one of the biggest worry in rehabilitation field, because it can condition the recovery of this kind of patients. Besides, the importance of uncovering swallow abnormalities in these patients cannot be underestimated. Langmore showed that early dysphagia is predictive of shorter survival duration in patients with one kind of primary dementia (FTLD)[1].

CONCLUSIONS

If these results were to be confirmed, we would have to manage these patients in different way and would see a possible evolution of swallowing disorders also in patients with cognitive impairment without cerebovascular diseases.

Tabel I.—*Results of statistical analysis.*

	FAB	Trail mak.	Token	Sel. Att.	Bucco-F. Apraxia	Ideomotor Apraxia
Positioning	0.205	0.468	0.525	0.919	0.369	0.231
Self-feeding	0.507	0.683	0,781	0.600	0.206	0.258
Liquid ingestion	0.307	0.650	0.600	0.203	0.666	0.231
Solid ing.	0.416	0.567	0.650	0.100	0.209	0.312
Text. Man. Sol.	0.231	0.389	0.496	0.498	0.215	0.256
Text. Man. Liq.	0.254	0.378	0.456	0.452	0.312	0.214

r values of Spearman's Rank Correlation Coefficient: Statistically Significant if >0.503

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Bilateral anterior interosseous nerve syndrome following the prolonged use of elbow crutches

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ABSTRACT

The following study focuses on a rare case of bilateral anterior interosseous nerve syndrome (AIN) due to excessive muscle stress following the use of elbow crutches after hip replacement surgery. The patient came under observation one year after symptom onset, showing no sign of recovery from the syndrome.

INTRODUCTION

The anterior interosseous nerve compression syndrome of the elbow occurs rarely and is often underrated. Electromyography, carried out on the basis of clinical suspicion, is essential to proper diagnosis. A conservative therapeutic approach is often recommended and surgical treatment proves to be successful only in refractory cases.

CLINICAL ASPECTS

In march 2012 a 55-year-old chef came under observation. He was in good health and had no history of musculoskeletal or nervous disorders. The patient had a history of dislocation on his right hip and subsequent damage to his joints, such that about 10 months earlier he had undergone hip replacement surgery. The patient reported that nearly a month after he started walking with elbow crutches he began experiencing difficulty in flexing his thumb and index finger of both his hands. The patient, however, did not report any sensory deficits or paresthesia. With regards to his first month of walking with elbow crutches, the patient also reported a slight bilateral pain in his forearm resembling a common inflammatory tendinopathy which he believed was most likely related to the constant and prolonged use of elbow crutches. Such symptoms occurred mostly at night.

The patient was found to have great difficulty in writing and in all those activities involving a pincer movement, like making the "OK" sign creating a well-rounded "O", or holding a sheet of paper in between his first and second finger without extending his thumb and index finger.

Clinical examination showed functional weakness of the long flexor muscle of the thumb, the deep flexor muscle of the index finger and third finger, and the pronator quadratus muscle. Electromyography showed an isolated neuropathy involving the anterior interosseous nerve, signs of partial denervation of the long flexor muscle of the thumb and index finger, minimal signs of denervation of the pronator quadratus muscle. X-ray examination excluded any evidence of fracture, dislocation, or bone neoplasm. Bilateral Magnetic Resonance Imaging and ultrasound, carried out on his forearm and hand, excluded injuries to the tendons and the peritendinous areas.

DISCUSSION

The anterior interosseous nerve syndrome, known also as Kiloh-Nevin syndrome, seems to be uncommon and mostly underrated. The risk of developing such condition is higher in those patients who play sports or have jobs that require demanding and repetitive movements of the forearm and wrist (especially wrist and hand rotation), such as rowing, weight-lifting, body building, tennis, squash, and woodwork. Poor physical condition, insufficient warming-up before practicing or playing, or the occurrence of diseases like diabetes mellitus, hyperthyroidism, or generalized neuropathies, might lead to its outbreak. Most cases of anterior interosseous nerve syndrome are due to compression of the anterior interosseous branch of median nerve as a result of trauma to the elbow, often associated with haemorrhage in the deep musculature. Other causes might include lesions of the anterior interosseous nerve as a result of bone fracture (pseudo anterior interosseous nerve syndrome), trunk and focal inflammatory diseases, thrombosis or tumors (often synovial). Iatrogenic causes have also been described, including elbow arthroscopy.

This syndrome is often mistaken with ligament damage to the fingers or brachial plexus injuries.

In our patient, we assumed that an excessive muscle stress following the constant and prolonged use of elbow crutches had caused damage to the nerve. Our patient used Canadian crutches with cuffs at the top to go around the forearm, about 1 cm under the elbow. These crutches require considerable muscular strength from the muscles of the forearm and hand.

CONCLUSIONS

It is not fully known what biomechanical factors lead to the development of secondary pathologies of the upper limbs in patients using mobility aids, such as wheel-chairs, crutches, and walking frames. According to our experience, shifting weight to the upper limb joints through crutches can be an important risk factor in the development of compression syndromes, but we believe that further research is still needed to determine the cause-and-effect relation between the actual pressure caused by weight and the de-

velopment of musculoskeletal and neurological disorders of the upper limbs.

Ours is an unusual case, still under observation, where the focal neuropathy has unusually affected the anterior interosseous nerve and has unexpectedly occurred bilaterally.

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