Florence, Italy

THE IMPACT ON DENTINE HYPERSENSITIVITY IN YOUR PATIENT. REAL OR IMAGINED?

Friday, September 6th, 10:30 – 12:30

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Oral Health Network
for Professional Education and Development

DR. DAVID GILLAM

Curriculum vitae

David (Gillam) graduated from Edinburgh Dental School in 1977 and subsequently gained experience as a Dentist both in general practice and the Armed Forces and Community Dental Services before undertaking a MSc. degree in periodontology from 1986 until 1988 at Guy's Dental School London. During his MSc. course, he also served part-time in teaching dental hygienists and undergraduates at Kings College Dental School (1986-1989). He subsequently worked at the Eastman Dental Institute for Oral HealthCare Sciences (1989-1998) where he was involved in laboratory and clinical research as well as teaching postgraduate students in periodontology. On leaving the university environment in 1998, he worked in industry for several years (1998-2001) initially with SmithKline Beecham (Assistant Director in Oral care) and subsequently with Block Drug Company, Incorporated, USA (Assistant Director in Oral Care). From 2003 to 2008, he worked with a Clinical Research Organisation as Senior Clinician where he gained experience both as a Clinical Assessor as well as a Principal Investigator conducting clinical studies on oral care products. At present, he is working as a clinical lecturer in periodontology at the Bart's and the London School of Medicine and Dentistry, Queen Mary University London. His main interests are in the area of the management of dentine hypersensitivity although he has experience in managing a number of laboratory and clinical studies which were designed to assess the efficacy of a number of oral care products. To date he has published over 50 papers on various dental topics.

Introduction

Dentine Hypersensitivity is a recognised clinical condition that has been reported to affect up to 74% of the population, however it has always been problematic for the Dental Professional to ascertain its impact in their patients during their daily activities. Several Investigators have previously reported that pain associated with Dentine Hypersensitivity is of a relatively low intensity and for most patients they are able to cope with their daily activities. More recently a number of Investigators using Quality of Life Questionnaires have indicated that the condition does have a major impact in patients. There is no doubt that certain life style factors have been implicated in the aetiology of the condition and if these factors are not modified during the counselling, prevention and maintenance phase of the treatment offered by the Dental Professional then it is likely that the pain arising from the condition will persist. The use of Motivational Interviewing with a view to encourage and empower personal behaviour that will enable the patient to take ownership of their treatment is therefore an exciting development in the management of Dentine Hypersensitivity. A further problem that needs addressing is whether there are in vitro and vivo models that can successfully identify potential desensitising products that can in turn benefit the patient with pain from Dentine Hypersensitivity. Several in vitro and in situ models have been used in this way however there are limitations with the models and the results from these experiments should not be extrapolated in to the clinical environment. The Randomised Clinical Trial (RCT) has historically been used for testing toothpastes in the clinical environment although there are a number of other clinical trial designs that have been used for in-office procedures. Most of these study designs are based on previous recommendations from Holland et al. (1997) and the American Dental Association (2012) recommendations for product evaluation. However there are a number of problems associated with these types of studies, for example, the variation in the individual subjective pain response and the impact of both placebo and non placebo effects during the study. Furthermore it is important to recognise that the results of these studies should be reported in terms of clinical relevance on whether the product relieves the discomfort from Dentine Hypersensitivity, thereby reducing its impact on daily activities, rather than on statistical significance per se. A final observation would be as to whether the results from well controlled clinical studies are truly representative of the type of outcomes that affect the normal population of individuals suffering from Dentine Hypersensitivity. There are therefore, a number of questions to be addressed in this Symposium for example whether the impact in patients suffering from Dentine Hypersensitivity is real or imagined, what is the ideal way of changing patient behaviour in the management of Dentine Hypersensitivity and do we have adequate in vitro and in vivo models for evaluating the effectiveness of desensitising products It is anticipated that the Speakers will attempt to answer these questions with practical solutions that will be of benefit to the Dental Professional when managing patients with Dentine Hypersensitivity.

PROF. GIUSEPPE PIZZO

Curriculum vitae

Giuseppe Pizzo graduated as a dentist at the University of Palermo (Italy) in 1992. In 2000, the same University appointed him as Researcher at the Department of Oral Sciences. In 2003 he was appointed as Senior Researcher and Assistant Professor at the University of Palermo, where he is currently responsible for two undergraduate courses (Periodontology, Preventive Dentistry and Community Dental Health), and for parts of the clinical training program. He also was the tutor for 5 PhD students and numerous undergraduate dental and dental hygiene students. Within the Dental School he served on several committees and, since 2011, as Academic Dean's Assistant; within the Dental Hygiene School, he served as Coordinator of the clinical training program from 2004 to 2011. Since 2011 he served on the Scientific Advisory Committee of the Faculty of Medicine and Surgery.

His clinical work at University of Palermo Medical Centre covers the non-surgical therapy of periodontal disease, and the preventive care of children and persons with special needs (medically compromised patients, particularly cancer ones). Since 2011 he has served as Coordinator of the preventive dentistry and oral diagnosis services.

Prof. Pizzo's areas of research activity have focused in the past years on oral Candida colonization and infections. Research work is currently situated within the field of preventive dentistry and clinical periodontology, particularly oral epidemiology and clinical trials on antimicrobial agents and mechanical plaque control. He has published over 40 peer-reviewed papers in the international literature, one monograph on gingivitis (Best Practice, BMJ Evidence Centre), two chapters on oral diseases in textbooks of dermatology (in Italian), and was the recipient of 7 research grants from the University of Palermo. For his research he received several national awards and the IADR CED Robert Frank Award (1999). He also served as reviewer and consultant to many national and international journals.

Since 2010 he has authored lectures on the management of dental hypersensitivity in several dental congresses in Italy.

In-vitro and in-vivo study results, what tells what?

Dentin hypersensitivity (DH) is a significant clinical problem that affects numerous individuals. This sharp pain, arising from exposed dentin in response to external stimuli, can be a particularly uncomfortable and unpleasant sensation for patients, because it interferes with their quality of life. The management of DH has classically consisted of using toothpaste containing potassium salts (e.g., potassium nitrate, potassium citrate) for nerve depolarization and disruption of neural response to pain stimuli. This method does not address the cause of the problem (open dentin tubules), and it does not provide rapid relief. Another approach, aimed at ensuring DH rapid and lasting pain relief, uses occlusion technology to plug or seal the dentin tubules so as to prevent fluid movement within the tubules and the subsequent pain response. Occlusion technologies include amine fluoride, strontium acetate, bioactive glass (e.g., calcium sodium phosphosilicate, (NovaMin®), arginine and calcium carbonate (Pro-Argin™). These agents are usually formulated into self-care dental products (toothpaste, mouthrinse) and into desensitizing pastes for in-office use. In the last years, occlusion agents have been investigated with various degrees of in vitro effects and in vivo efficacy.

In this lecture, the capabilities and limitations of in-vitro and in-vivo studies will be presented and discussed. Dentin disc-based in-vitro models generally assess the ability of actives and formulations to provide dentin occlusion that can penetrate tubules, significantly reduce dentin permeability and remain after repeated acid challenge and exposure to simulated pulpal pressure. The results obtained from in-vitro studies allow to gain insight into the mechanism of action of occlusion technologies, and address important questions regarding the nature and extent of dentin tubule occlusion. The use of in-vitro models also provides a useful screening method for evaluating potential desensitizing agents. Surface analysis techniques including scanning electron microscopy (SEM), atomic force microscopy (AFM), confocal laser scanning microscopy (CLSM), energy dispersive X-ray spectroscopy (EDX), electron spectroscopy for chemical analysis (ESCA), secondary ion mass spectroscopy (SIMS), near infrared spectroscopy (NIRS), allow for probing the effects on dentin surface (morphology/thickness/chemical composition of surface coating and occlusion deposit) and the resistance of the deposit to acid challenge. The hydraulic conductance method provides quantitative data describing the ability of occluding deposits to slow outward dentin tubule fluid flow, a key factor attributed to reducing hypersensitivity. Hydraulic conductance measurements allow to determine the longevity and reactivity of the occlusive deposits, thus giving a better understanding of how the occlusion performance of the formulations translates into the clinical hypersensitivity reduction.

Although a longitudinal disc-based model has been recently developed to emulate actual use conditions of desensitising formulation, in-vitro methods still suffer from some limitations in mimicking the "real-life" individual behaviours and the oral environment. Therefore, clinical measurement of the reduction in pain remains the gold standard for evaluating the effectiveness of a treatment. In-vivo studies, in fact, evaluate the activity of different formulations when used by patients representative of the general populations and in presence of relevant patient-based variables (e.g., brushing times and forces, acid challenges introduced by acid beverages and foods, different amount of exposed dentin). According to the guidelines by Holland et al. (1997) and the ADA's Acceptance Program Guidelines (2012), a double-blind, randomized, parallel groups design is recommended. Subjects may have multiple sites scored, the vestibular surfaces of incisors, cuspids and bicuspids being preferred as sites to be tested, and at least 2 hydrodynamic stimuli should be used, such us tactile, cold or evaporative air ones. Negative and benchmark controls should be included in the study design. Outcome evaluation of the treatment could include both a stimulus-based and a response-based assessment. The former consists in the measurement of a pain threshold by using an electronic pressure sensitive probe; the latter consists in the estimation of pain severity by a timed air blast, using a visual analogue score (VAS) and/or a numerical rating scale such as the Schiff Cold Sensitive one. Outcomes should be expressed in terms of clinically significant changes in symptoms. The subject's overall assessment of the treatment may be also made via a questionnaire at each time period in a longitudinal study, which should last 6-8 weeks at least.

PROF. DR. CHRISTIAN HIRSCH, MSC

Curriculum vitae

1992	graduate as a dentist at the University of Halle (Germany)
1993-1997	Assistant Professor at the Department of Pediatric Dentistry at the University of Halle (Germany)
1995	Doctoral thesis defense (Dr. med. dent.)
1997-2002	Postgraduate program in pediatric dentistry at the Department of Pediatric Dentistry at the University of Halle (Germany)
2002	PhD thesis defense (Dr. med. dent. habil.)
2003-2005	Postgraduate study of epidemiology at the Technische Universität Berlin (Master of Science)
2007-	Full Professor, Department of Pediatric Dentistry, University of Leipzig, Germany

Research activities

- Oral health related quality of life in children and adolescents
- Temporomandibular disorders in children and adolescents (etiology)

Quality of Life in Patients with Dentine Hypersensitivity

Quality of life research in medicine and dentistry has attracted increasing attention over the past years. Clinicians and researchers agree more and more that the patient's perspective is as equally important as clinical outcomes when evaluating success of a treatment.

The concept of oral health-related quality of life (OHRQoL) facilitates to study the impact of a disease on a person's total oral health. It describes how oral health affects the person's ability to function, his or her psychological status, social factors and pain or discomfort. The aim of the presentation is to introduce the audience into the field of quality of life research.

In the first part, a definition of quality of life, health-related quality of life and oral health-related quality of life will be given. Furthermore, it will be demonstrated how oral health-related quality of life can be measured with instruments and how such a measure can be developed.

In the second part of the presentation, it will be discussed what impact exposed dentin or dentin hypersensitivity might have on OHRQoL. Therefor a study is presented to evaluate OHRQoL impairment in patients seeking care for hypersensitive teeth in comparison with general population subjects using the German version of the Oral Health Impact Profile (OHIP-G).

DR. MED. DENT.
CHRISTOPH RAMSEIER, MAS

Curriculum vitae

	Education and Graduate Education at the University of Bern, Switzerland
1995	National board exam
1995-1996	General dentist in private practice
1996-1998	General Dentist and Lecturer at the Dental Hygienist School, Berne, Switzerland
1999-2000	Graduate program in Periodontology & Implant Dentistry, School of Dental Medicine, University of Berne, Switzerland
2000	Doctoral thesis defense
2001-2004	Assistant Professor at the Department of Periodontics and Fixed Prosthodontics including Implant Dentistry, University of Berne, School of Dental Medicine, Switzerland
2004	Board certification, Specialist SSO in Periodontology according to the criteria of the European Federation of Periodontology (EFP)
2004-2008	Visiting Professor, University of Michigan School of Dentistry, Department of Periodontology and Oral Medicine, and Research Fellow at the Michigan Center for Oral Health Research (MCOHR), Ann Arbor, MI, USA
2008-	Assistant Professor, Department of Periodontology. University of Berne, Switzerland

Research activities

- Periodontal Risk Management
- Tobacco use prevention and cessation in the dental practice

Motivational Interviewing

The majority of clinical trials for the treatment of dental hypersensitivity today conclude that patient compliance with both oral hygiene and dietary regimens is paramount to gain satisfactory treatment outcomes and predictable long term successes. Hence, attempts to engage all patients to follow their individualized oral care regimens are needed which can be incorporated into the dental treatment plan to encourage the modification of all common risk factors for hypersensitivity. Therefore, next to the standard of care for oral hygiene practices, these regimens include dietary counselling as well as instructions to avoid brushing the teeth following the intake of acid containing drinks.

In everyday dental practice, conventional heath education approaches (such as e.g. dietary advices or oral hygiene instructions) frequently lack long-term effect and thus appear to need repetition. Motivational Interviewing (MI), in contrast, is based on a different assumption of human behaviour change. It concludes that the pure repetition of health education is insufficient to bring about behaviour change and that motivation to change is elicited "from within the patient" rather than externally imposed upon the patient by a practitioner. MI has been defined as a "directive, client-centred counselling style for eliciting behaviour change by helping clients to explore and resolve ambivalence" (Miller and Rollnick, 2002). By eliciting and elaborating upon the patient's own reasons for change, the motivation for change is intrinsic or internal, rather than externally imposed. MI practitioners, therefore, attempt to enhance intrinsic reasons for change by facilitating an exploration and resolution of the patient's underlying ambivalence.

MI originated in the field of addictive behaviour therapy but has increasingly been applied to a wide variety of other behaviour change issues including behaviours such as tobacco use, diet and exercise. In oral care, there is an increasing wealth of support for MI as an effective method of counselling for behaviour change. Consequently, all dental professionals are urged to acquire appropriate methods and skills to establish the therapeutic relationships necessary to increase patient motivation and compliance towards better health behaviour and quality of life.

Notes: