

THE MALNUTRITION IN THE ELDERLY: A CLINICAL APPROACH

MARIA CONCETTA PANDOLFO - MANFREDI RIZZO - ENRICO CARMINA - FRANCESCO CASTELLO - PASQUALE MANSUETO - GIACOMA RENDA - DANIELA AVILA - SALVATORE BUCCHIERI - VALENTINA CANNONE - CARMELA SFERRAZZA - GAETANA DI FEDE - GIOVAM BATTISTA RINI

Department of Clinical Medicine and Emerging Diseases, University of Palermo, Italy

[Un'approccio clinico nella malnutrizione nell'anziano]

SUMMARY

The elderly represent an high-risk category for malnutrition for a number of changes in their physiological, pathological, economic and social patterns. They usually use several drugs and their physical activity is progressively reduced. Any illness is highly influenced in its course by the nutritional status and, therefore, the identification of malnutrition in the elderly needs to be fast, for its strict correlation with the risk of both morbidity and mortality.

In addition, recent data suggest that malnutrition has to be considered an independent risk factor for morbidity, complications and re-hospitalizations in the elderly. Therefore, physicians need to acquire a "geriatric sensibility", using the correct clinical and methodological approaches in the management of this illness.

Key words: Malnutrition, symptoms, illness.

RIASSUNTO

Gli anziani rappresentano una categoria ad elevato rischio di malnutrizione per una serie di cambiamenti nel loro stato fisio-patologico, economico e sociale. Generalmente usano una serie di medicine e la loro attività fisica è progressivamente ridotta. Qualsiasi malattia è altamente influenzata nella sua evoluzione dallo stato nutrizionale del soggetto e, pertanto, l'identificazione della malnutrizione negli anziani deve essere tempestiva, per le sue strette relazioni con il rischio di morbilità e mortalità.

Inoltre, recenti studi hanno evidenziato che la malnutrizione deve essere considerata come un fattore di rischio indipendente per mortalità, complicazioni e nuovi ricoveri nella popolazione anziana. Pertanto, i medici devono acquisire una "sensibilità geriatrica", usando i corretti approcci clinici e metodologici nella gestione di tale malattia.

Parole chiave: Malnutrizione, anziani, sintomi, malattia.

Introduction

The prevalence of the proteic-caloric malnutrition increase as a function of age in both genders⁽¹⁾, while in the hospitalized patients is always elevated (30%-60% of total patients) and in private hospitals or geriatric units may led to 85%⁽²⁾. The elderly represent an high-risk category for malnutrition, since they are often affected by chronic diseases that led them to frequent hospitalizations (even in units with low geriatric knowledge!) with the relative problems of compliance. They usually use

several drugs (and many of them have anorexic side effects) and their physical activity is progressively reduced.

Any illness is highly influenced in its course by the nutritional condition and, therefore, the identification of malnutrition in the elderly has to be timely, for its strict correlation with the risk of both morbidity and mortality⁽³⁾. In subjects that undergo non-neoplastic surgery, the prevalence of complications is 48% in patients with malnutrition in relation to 23% in patients without the disorder. In addition, many major adverse events, such as myo-

cardial infarction and thrombosis, are more frequent in patients with malnutrition (31%) than in those without the disorder (9%)⁽⁴⁾. Therefore, malnutrition has to be considered an independent risk factor for morbidity, complications and re-hospitalizations^(5,6).

The same remarks may be done regarding the period of hospitalization. In non-neoplastic hospitalized patients, the period of hospitalization is about twice in those with malnutrition, with a reduction >10% of body weight in the former month or with a body weight <75% of ideal weight in relation to controls⁽⁷⁾. In old women with malnutrition, hospitalized for an hip fracture, mortality was five-times higher than in controls⁽⁴⁾. Moreover, the gain of at least 5% of body weight led to a significant reduction of morbidity, complications and mortality in older hospitalized patients with malnutrition⁽⁸⁾.

Main causes of malnutrition in the elderly

The etiologic identification of malnutrition represent the first step for a correct clinic diagnosis. There are several causes of malnutrition and they can be summerized as medical or social causes (Table 1).

MEDICAL	SOCIAL
Chronic bronchitis	Irregular food intake
Enphisema	Poverty
Gatric resection	Lonely
Bad chewing	Inability in going out
Difficulty in salivation	Low social level
Smoking	Depression
Alcool	Low mental level

Table 1. Medical and social causes of malnutrition.

Some factors may induce a decreased food intake, such as the cost or the difficulty in the preparation of some particular foods, as well as problems in chewing, the presence of eating disorders (for gastric, hepatic or bowel diseases) or the inadequate utilization of energetic substrates (for ipoin-sulinism, enzymatic defects, hyperuricemia, hyperazotemia)^(1,2,4,9,10).

The anorexia (e.g.a persistent food refusal, with concomitant body weight loss) is also cause of malnutrition and it is often unknwon in the elderly⁽⁹⁾. As previously described by some authors, the progressive reduction in food intake has to be probably related to the appearance of a "geriatric anorexia", which follows some anatomical and

functional alterations of the food intake control mechanisms⁽¹⁰⁾. In particular, there have been described in the elderly the following dysfunctions: a low lateral hypothalamic dopaminergic neural activity in response to total parenteral nutrition, a serotonergic dysfunction related to the eating behaviour and the nutritional status, a decreased synthesis and activity of both hypothalamic dopamine and serotonin, strictly connected to the regulation of food intake⁽¹¹⁻¹³⁾.

Moreover, the elderly who wear a recent mourning (or in general with depression), showan higher body weight loss in relation to younger subjects with similar illness⁽¹⁴⁾. The association between anorexia and depression is probably due to an elevated activation of the corticotrop-hormon releasing factor (CRF)-induced, which seems to have in vitro an anorexic effect⁽¹⁵⁾. In addition, both the anorexia and the unintentional body weight loss in the elderly may be evaluated and treated by agents for the depression^(16,17). Other causes of anorexia may be the zinc deficit (frequently associated to the presence of diabetes, the use of diuretic drugs, or low food intake), the untreated hyperthyroidism, the primary hyperparathyroidism, the hypercalcemia^(19,20).

In addition, dispnea, that may be present during meals in patients with chronic obstructive pulmonary disease, and abdominal pain, in subjects with angina abdominis, may be responsabile of food refusal. In the para-neoplastic syndroms, some hormones, such as the bombesin and calcitonin, secreted by the tumor, may show an anorexic effect.

- Lack in the determination of weight and height at hospitalization
- Lack in monitoring personal weight during hospitalization
- Lack in evaluation of nutritional intake
- Dispersion of responsibilities in patients care
- Fasting for instrumental exams
- Poor assistance during meals
- Bad Food
- Lack in recognition of the correct caloric-nutritional need
- Delay in nutritional supplementation
- Long use (or exclusive) of nutritional infusions
- Lack in knowledge of nutritional products
- Lack in collaboration between sanitary staff: doctors, nurses, dietitians
- Low availability of specific laboratory exams
- Low knowledge of all nutritional problems

Table 2: Factors that negatively interfere with the evaluation of the nutritional state in the hospitalized elderly.

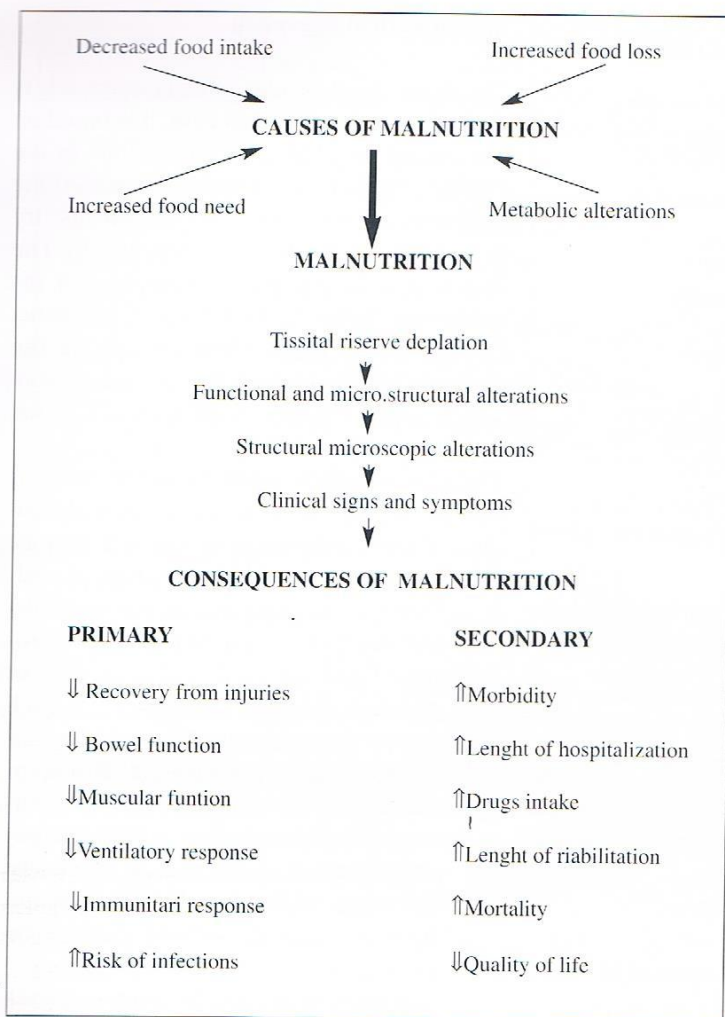


Fig. 1: Causes and consequences of malnutrition.

Peripherically, the geriatric anorexia seems to be linked to the reductions in the senses of both taste and smell, as well as to the increased synthesis of colecistokinin (CCK); in experimental studies, it has been reported that CCK may induce a state of satisfaction⁽²¹⁾.

During hospitalization, may also exist other factors that negatively interfere with the evaluation of the nutritional state in the elderly (Table 2). Moreover, multiple causes of malnutrition may led to different and sometimes very serious clinical patterns (Figure 1).

Clinical manifestations

The malnutrition in the elderly is not so clear at beginning, The clinical pattern is poor of specific signs and symptoms (Table 3), which appear lately

and are usually considered aging-related. Therefore, it is often hard to distinguish the malnutrition in the elderly and to make the appropriate diagnosis⁽²²⁾.

Diagnosis

The diagnosis should be done in the pre-clinical step, to plan the best nutritional approach and to avoid possible related complications

The evaluation of the nutritional state in the elderly is to-date still difficult, with a lack in tecniques and in ideal markers, which may be classified in antropometric, biological, instrumental markers; however, this issue requires a comprehensive assessment (Table 4).

Clinical evidences are represented by the early modifications in body weight, appetite and food interest⁽²³⁻²⁵⁾. Even if biological markers do not own high sensibility or specificity, their comprehensive assessment may give us further insights to be able to make a premature diagnosis of malnutrition in the elderly (Table 5).

The mesasurement of plasma albumin is often used, for the easy routinely assay; in addition, we can distinguish the different forms of malnutrition (light, moderate, severe) according to plasma albumin levels.

However, the limit is represented by its long half-life (about 20 days) and, therefore, it cannot be used to monitor the modifications of the nutritional state⁽²⁶⁻²⁸⁾. By contrast, the transferrin has a shorter half-life and it may be used to monitor this nutritional state modifications⁽²⁷⁾. The retinol binding protein is the marker with the shortest half-life and its reduction in patients with malnutrition is premature and marked; however, there have been reported false negatives, such as patients with renal failure, since this protein is filtered at the glomurular level⁽²⁸⁾. In addition, the mesasurement of plasma total cholesterol may be usefull when it has been reported a reduction of about 25% in the last year and when the causes of hypocholesterolemia have been excluded⁽²⁹⁾; the hyper-omocysteinemia (>15 mmol/l) may emphasize the deficit of folates or vitamins B6 and B12⁽³⁰⁾.

The record of weight and height cannot be

SIGNS	CLINICAL PATTERN	NUTRITIONAL DEFICIT
General state	Weight loss	Proteins and energy
Superficial Skin	Dermatitis	Proteins, vitamin A
Deep skin	Thin; Edema	Proteins and energy; tiamin
Mucosae	Pale	Iron, vitamin E
Nails	Fragile	Iron; aspecific
Hairs	Alteration in the color and in the structure; loss	Proteins and energy; iron,
Lips	Lesions in the corners, in both parts	Proteins, iron, vitamin B12, vitamin B6, niacin
Skeleton	Muscular atrofia	Proteins and energy

Table 3: Main clinical signs of malnutrition and probable related nutritional deficit.

<ul style="list-style-type: none"> • Clinical anamnesis: identification of risk factors (previous or concomitant illnesses, previous surgery, symptoms, drugs) • Weight anamnesis: usual weight, actual weight • Alimentary anamnesis: uses and preferences, actual intakes (direct observation) • Functional parameters of the psico-physical state: the Mini Mental State Examination, the Geriatric Depression Scale, the IADL Scales • Clinical examination: research of possibile signs of malnutrition • Antropometric anamnesis: weight and height • Blood tests: haemoglobin, hematocrit, linfocitis, albumin, transferrin, total cholesterol.

Table 4: Directory for the evaluation of the nutritional state in the elderly.

excluded by the routinely geriatric examination^{23-25,27)}, with the concomitant calculation of the body mass index (weight in kg/height in squared meters). The mesurement of arm's circumference may represent an in direct index of the muscular mass. As a notice, there are also a few strumental methods evaluating body composition that may give insights on the nutritional state (e.g. CT, DEXA)^(31,32), but they cannot be used in everyday clinical practice.

The multi-dimensional evaluation is mainly based on the Mini Nutritional Assessment (MNA)^(33,34), which comprises a general evaluation with anthropometric variables and the analysis of weight variation, food intake and disability or cognitive state. However, only an expert and careful clinical examination may recognize the malnutrition in its pre-clinical state.

Therapeutical approach

The main target of any sanitary approach is the prevention and, in this case, it is based on the evaluation of the nutritional state in the elderly at higher risk of malnutrition^(1,3). If the diagnosis has been done, we should first try to quantify the nutritional deficit^(4,27,31). The first step is the definition of the type of the nutritional deficit (caloric-proteic, energetic, vitaminic, by oligo-elements) using the methods of the nutritional state assessment, which requires a multi-level approach, based on patient's own needs.

The first approach, when applicable, consists on the elimination of the causes of malnutrition; if this intervention is rapid, it may be effective. However, when the cause of mal-

nutrition is unknown or not treatable, the nutritional state is highly compromised and we need to use dietetic or pharmacological therapies; in each patient the intervention has to be specific^(1,4,8,10). In presence of a caloric or caloric-proteic malnutrition it is important to improve the diet, with the proper modifications in the quality and in the quantity, when the elderly does not have any alterations in the gastro-enteric district^(35,36).

The integrators may be used to enrich or personalize the diets, There are special dietetic integrators, which are naturals and completed, as well as steriles and stables for 7-12 months at room temperature, available as already-made beverages or puddings. There are also modular integrators (normocaloric, hyper-caloric, hyper-proteic) constituted by one or more macronutrients (sugars, lipids, proteins), possibly with vitamins, minerals, oligo-elements or aminoacids^(37,38).

The somministrazione of vitamins of the B complex is, for instance, usefull in the treatment of the frequent confusional states of the elderly, usually caused by chronic diseases or trauma; the proteic supplementation may usually be used during long immobilization or hospitalizations. However, when the food cannot be eaten, we can use the enteral (small boli) or the parenteral feeding (endovenous)⁽³⁹⁾.

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VARIABLES	COST *	SENSIBILITY* *	LIMITANT FACTORS
Weight Anamnesis	1	3	
Alimentary Anamnesis	3	2	Need collaboration
Energetic loss Evaluation	1	3	Several illnesses
Albumin	1	3	Infections, trauma, stress, variations in the physical stand
Retinol binding protein	2	3	Infections, trauma, stress
Transferrin	2	3	Infections, trauma, stress, tumors
IGF-1	3	3	Hypotiroidism, estrogen therapy, hepatic cirrosis, recent meet/fish intake
Ratio creatinin/height	1	3	Renal Failure, presence of uric acid, purins or chromogen compound in urine
Linfocytis count	2	1	Infective diseases

* According to a progressive scale from 1 to 3.
from Bissoli et al. Giorn Geront 2001⁽⁴⁰⁾.

Table 5: Clinical and laboratory variables for the evaluation of the nutritional state in the elderly.

showed that the elderly has a reduced ability in the recovery of the lost mass, for his typical age related metabolism and for his inability to perform physical activity. Therefore, rehabilitation programs may always support the treatments of the nutritional state^(40,41).

Conclusions

The elderly represent the only percentual part of the population of industrialized countries that is in constant increment, due to both increased mean life and child survival. The European population is the oldest in the world, and those from Italy and Greece represent probably the ancient. The demographic projections in our country predict that in 2050 the 32% of our population may be constituted by people with age >65 years and the 11% by people with age >80 years⁽⁴²⁾.

The elderly are subjects at high risk of malnutrition for a number of changes in the physiological, pathological, economic and social patterns. Regarding the clinical pattern, the health state and the nutritional state are strictly connected and older people represent a model in which the two conditions show a peculiar order, in respect of the other age subclasses. Aging appears with a progressive reduction in the homeostatic functions and in the organs reservoirs. This phenomenon led to the defi-

nition of the elderly as a "fragile" subject and for this condition he is at a higher risk of disease and therefore of several potential organ failures.

In this context, the food intake and the nutritional state is very important in the elderly, that, moreover, usually adopt incorrect feeding with unknown or unpredictable carential disorders. These nutritional deficits led to several clinical patterns, often aspecific and with poor symptoms, that may be mis-diagnosed as linked to aging. Therefore, physicians need to acquire a "geriatric sensibility", constituted by the knowledge of the illness, the correct clinical approach (even better if in a sub-clinical step) and the correct methodological approach. This is how we should face the delicate problem of the malnutrition in the elderly.

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Request reprints from:

Prof. GIOVAM BATTISTA RINI

Department of Clinical Medicine and Emerging Diseases,

University of Palermo

Via del Vespro 141

90127 Palermo

(Italy)