NUTRITIONAL PROBLEMS IN NURSING HOMES WITH SPECIAL REFERENCE TO SPAIN

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Abstract: In this review, after some short conceptual and demographical introductory remarks, I will focus my attention on four topics: a) The question of nutritional assessment of the elderly living in a nursing-home; b) Main nutritional disorders; c) Nursing-homes nutritional studies in Spain; and d) Guidelines and protocols.

Introductory remarks

A nursing-home may be defined as an "open gerontological center for the personal development, and multiprofessional social attention and healthcare, where elderly people with some degree of dependence live temporally or permanently" (1). People who live in a nursing home, by definition, are not longer able to cope independently and thus tend to be the most vulnerable amongst the elderly population. There are several ways to become a definitive resident in a nursing-home. In the frame of a changing society the most important of them are linked to demography and to the consequences of the aging-process.

At the beginning of 2001, the population of Spain is forty million people. The last official census (31. December. 1996) found 6.196.497 people over 65 years old (15.6%), and 1.356.187 over 80. Life expectancy at birth was 74.3 years for men and 81.5 for women in 1994 (2). A 65 years old person has yet a life expectancy of 16 (men) or 19.8 years (women). These figures are very similar to the ones that can be found in other European or American countries. We are living in an elder society. All these numbers will increase along the next decades, and we must take into account this reality when analyzing nutritional problems and to establish educational or interventional programs. Other two realities to deal with are that health and related health problems are the main concerns for the elderly; and that functional impairment and levels of dependence increase with age, but the number of caregivers decreases.

Moreover, we must consider that nursing-homes represent a very complex and heterogeneous world, with large differences in parameters as size, number of residents, financial or other dependences, programs and services offered, etc. Main objectives of care in a nursing-home are summarized in table 1; relevant among them is to obtain a well nutritional balance for the residents. An appropriate nursing-home policy in this field must include: a) assessment of the nutritional status at arrival and periodically, b) to provide healthy foods and a well balanced diet, meeting the energy requirements, taking care of the eventual need of a special diet, and c) to respond in every case to the nutritional needs of the resident.

There were 188.862 nursing-home beds in 1998 in Spain, 2.98 for a hundred people over 65 years old. 58.493 belonged to the public sector. The other 130.369 were privately owned. These proportions are clearly below the European Union recommendations, that are established around 5 or 6 beds a hundred people over 65 years.

The aging process is a continuous and irreversible process. The rate of decline varies among individual subjects and can be modulated by three conceptually different influences, that have different relative weight in each individual: physiology (changes due to the action of time), pathology (adaptive sequel of previous diseases or surgeries suffered throughout one's life), and, finally, changes induced by the individual lifestyle, the environment, or by his/her different risk factors, including polypharmacy. Changes in nutrition and in nutritional status may be caused by any of these elements.
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Table 1
Main objectives of care in a nursing home

* To control and to treat the diseases and problems detected.
* To offer a healthy, varied, and balanced diet, considering the specific needs of each resident. If possible to give the choice among different menus, and to consider the formal presentation of foods.
* To maintain -or to improve if possible- functional skills through rehabilitation programs.
* To prevent the increase in dependence through specific programs and therapies.
* To promote and to improve social relationships among residents, relatives, and nursing home professionals.
* To develop social and cultural programs, supervised by experts.
* To maintain a good physical appearance of residents.
* To maintain clean and well arranged rooms and common spaces of the nursing home.

Among the physiological changes it would be necessary to take into account those affecting the gastrointestinal system, sensory losses, losses in muscular mass or in the immune system, water dysbalance with deficiencies in the thirst mechanism, and many others. The same could be said about changes derived from previous diseases or surgery, or about the influence of previous life styles or of different risk factors, including social ones like poverty or loneliness. In nursing-homes we must add the possibility of a high prevalence of critical situations. Among them acute intercurrent diseases, use and abuse of drugs, and several diseases like tumors or dementia.

Nutritional assessment of the elderly living in a nursing home

To assess nutritional status in the elderly raises many problems, most of them different and more complex than those that can be found in younger people. Most of these difficulties derive from the aging related changes mentioned before. A complete description of this assessment is not intended for this article and may be found elsewhere (3-4). When nutritional assessment must be performed in a nursing-home other specific conceptual and practical difficulties may be added. Perhaps, this could be one of the reasons to explain the scarce number of studies on this topic.

As a rule body mass index (BMI) has been the golden standard to assess the presence of obesity or undernutrition. A BMI below 20 is considered as a static marker of undernutrition, and the loss of 5% of the body weight in the last month or 10% during the previous six months are dynamic markers of this disease. Serum albumine levels below 3.5 g/dl mean in most cases protein calory malnutrition. A diagnosis of obesity is accepted when BMI is over 29.

However, these criteria are insufficient to establish a more sensitive diagnosis. Anthropological and biological criteria are more useful and accurate. An additional point is the need for tables with local reference values to compare the data of the people we are studying. Another limit of BMI is the lack of qualitative information about relevant questions as the serum level of micronutrients or the degree of hydration. These last parameters are needed for the correct nutritional assessment of a resident, and have a significant diagnostic and prognostic value in a great variety of clinical situations.

Many years ago, in 1979, Davis and Holdsworth identified 26 potential risk factors that they thought might contribute to malnutrition in residential homes (5). In the last years several protocols have appeared looking for an easier and better approach. Perhaps one of the most successful has been the Mini Nutritional Assessment (MNA). It is an instrument developed in France and United States that includes 18 different variables in four main areas: anthropometry, global assessment, dietetic parameters and subjective assessment. The maximum possible score is 30 points. Answers over 24 points are considered as normal. Subjects below 18 are defined as undernourished, and an individual is considered "at risk" between 18 and 24 points (6-7). A Spanish version of MNA has been validated and has shown its efficacy in nursing-homes (8), and in mid and long-term stay care units (9).

A global assessment instrument, the Resident Assessment Inventory (RAI), collects information to identify residents' problems including those related with nutrition (10-11). Medicare in the United States established the MDS (Minimum Data Set) as mandatory, a form of assessment, part of the RAI, that searches a global care program (Table 2) with evident efficiency as a screening system in this care setting (12). Among the advantages of MDS are to be a good method to assess nutritional status in the elderly, and to have been validated with other assessment standard methods like impedanciometry or the combination of the different anthropometric and biological parameters (13).

In any case, and independently of the assessment method chosen, nutritional assessment in the elderly must add to a careful history and a complete physical examination other issues listed in table 3 (11).

The assessment must be comprehensive and will include in every case the reason of nursing-home admission. Information about activities of daily living, the previous ability of the patient and the reason of failure of a less structured non-residential way of life must be obtained. Cognitive impairment, sensorial or perception losses, and the possibilities to get a social support must also be explored.

A list of problems must be developed, including active disorders, previous diseases, and surgical procedures. It is necessary to know the exact drug schedule of the resident, including doses, looking for eventual interactions, needs of monitorization or adequacy at the present moment.
Therefore, not only a correct nutritional assessment will be performed, but also we will be ready to establish an appropriate program according to the personal characteristics of each patient in order to improve or, at least, to maintain a good quality of life and to prevent possible diseases derived of an inadequate nutrition.

**Main nutritional disorders in elders living in a nursing home**

Main concerns related to nutrition in the elderly who live in a nursing-home are: a) weight losses and malnutrition, b) dehydration, c) hyponatraemic status, d) comorbidity, e) demented patients, f) acute intercurrent diseases, g) special diets, and h) patients with parenteral nutrition or with gastrostomy.

In any case, according with Morley and Silver, the main nutritional problem will be weight loss, as a step previous to undernutrition (14). Weight loss has been shown to be a predictor of early morbidity and mortality, and plays an important role as a major risk factor for the downward spiral leading to frailty and mortality (15-16). I will focus in it in my next comments, with only a few comments about the other points listed.

Obesity in nursing homes is, clearly, less prevalent than undernutrition and when present should be mild or moderate. Even more, it has been suggested that a moderate overweight could have protective effects on mortality in people over 75. At this respect is especially significant the study of Stevens et al., carried out along twelve years, over 62,116 men and 262,019 women, looking for the relationship between BMI and mortality (17). In any case our duty must be to correct obesity, especially if it coexists with other diseases like high blood pressure, diabetes mellitus, osteoarthritis or a chronic respiratory disease.

An important contributory factor to weight loss and malnutrition in nursing-homes is, frequently, a negligent attitude of caregivers and doctors. To delay nutritional assessment, or, simply to be unaware of it, supposes an added risk. Weight loss and malnutrition are produced, in many cases, by causes easy to detect, which can be corrected with an early diagnosis.

Multiple reasons contribute to the development of malnutrition in elderly persons living in a nursing-home. Among them a poor or inadequate nutritional intake, depression, lack of physical activity, a poor oral hygiene, ill-fitting dentures, or the negative effect of drugs. Consequences of a poor nutritional care could be severe. In all of cases it represents a risk factor for many other diseases (18). Among micronutrients a vitamine D deficit predisposes to hip fractures, low levels of zinc are associated with a worse response to infections and delayed wound healing, and there are different and numerous problems associated with deficits in folate, vitamine B-12, iron, magnesium, etc.

There are many other important nutritional problems linked to the health of the elderly living in a nursing-home. Among them the risk of dehydration, the coexistence with diseases like diabetes mellitus, arterial hypertension, heart failure, or several gastroenterological diseases, all of them with negative incidence in the nutritional status, and the need of specific dietary requirements.

Similar considerations could be established around the meaning of any of the so called "geriatric syndroms" in elders living in nursing homes. A good example may be pressure ulcers. We know that they are prone to appear in patients with undernutrition, and that undernourished residents have a worse response to treatment and longer healing times (19).
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Nursing homes nutritional studies with special reference to Spain

It is difficult to offer data on prevalence of malnutrition in nursing-homes. Some American studies stimate it is between 15 and 60% (20-21); obviously this is a very large and excessive range. It is clear that the accumulation of certain diagnosis like Alzheimer disease in nursing-homes significantly increases these values.

I will try briefly to present some of the main studies carried out in our country on this matter in the last decade. I would like first to underline that there are not many studies on this field, at least during the first years of the decade. Among the possible reasons for it a certain ageism or lack of interest for the questions affecting elderly people can be mentioned. But besides that, there are objective difficulties to carry out this sort of studies, including methodological problems (22-23). It is necessary to stablish clearly what we want to know: dietary needs, composition of the diet, total energy intake, specific macro or micronutrients intake, global nutritional assessment of the residents, and so on. Each of these questions require specific methods, and demand a close collaboration, not always given, from the resident and from the institution. Even more, aims and technics will differ greatly depending on the medical level we try to analize: community, nursing-homes, or hospitals.

The CANARY ISLANDS STUDY was carried out in Tenerife at the beginning of the decade (24). It included 130 nursing-home residents (mean-age 71 years). Nutritional status was worse in those with cognitive impairement, ambulatory dificulties and need of help to eat. Mortality after a 20 months follow-up was closely related with a worse basal nutritional status.

Some years later Salvá et al presented data from a nutritional assessment study carried out in Catalanion nursing homes, using the MNA as instrument. Conclusions suggested a 5.7% prevalence of undernourishment among the residents and another 47% of them at risk (8).

In 1996 the Spanish Society of Geriatrics and Gerontology (SEGG), together with the Spanish Institute ofr Social Affairs (Inersso) carried out a large study of 1152 residents in 35 nursing homes. Using the BMI as criterion, and taking into account that residents with chronic severe diseases were excluded, only a 4% presence of malnutrition (BMI<20) was found (25).

A pharmaceutical company, Nutricia, sponsored a rigorous study carried out by the SEGG in public nursing homes of three different Spanish regions (Andalucía, Cataloniya and Galicia) in order to set local nutritional parameters for elderly people. Patients with chronic or severe diseases were also excluded. Final sample was 582 healthy residents (81 years old). The global nutritional satatus was adequate, but, even with the exclusion criteria described, we found that 30% of the residents needed some special diet, and 14% drunk alcohol daily (mean: 16 gr/day) (26).

The main interest of another study carried out in public nursing-homes of Asturias, with a sample of 1879 elderly residents, was that it showed that only 1% of the nursing-home population required permanent enteral nutrition (27).

A Spanish private company (EULEN) has presented in recent years some reports about the condition of the elderly living in nursing homes owned by them. One of these studies, carried out in Madrid, assessed the nutritional status on a sample of 205 residents. MNA was the instrument used. They found a 25% presence of undernourished residents, and another 51% at risk. Undernutrition showed a good corelation with dementia and with the number of diseases (28). The same group, with similar methods (MNA), assessed the nutrtional status of the residents in another nursing home in Valencia. The sample were 94 residents, and the mean age 79.3 years. The prevalence of undernourished residents was 5.3%, with another 44.7% at risk (29). Perhaps the main interest of these two studies is to highlight the different results they found, probably explained by the differences between both nursing homes.

An interventional study with a sample of 99 demented patients (mean age 86 years) living in nursing-homes was carried out recently by our own group. Patients received daily oral nutritional supplements for one year. Follow-up showed no changes in the course of dementia, but morbidity and mortality were lower than expected in the group treated (30).

A last comment I want to underline is the increasing interest of the Spanish geriatric community for nutritional problems. A proof of this growing concernem is the number of abstracts on nutritional assessment (nutritional status, diets, etc) presented in the last congress of SEGG (June 2000): nine studies; and three more commenting interventional nutritional studies (31). It represents a higher number that the whole presented along the period 1990-1995.

I will conclude this short survey emphasizing the high proportion of residents with nutritional problems, specially undernutrition, we can find in nursing homes world. There is a great variability among the different assessment studies, depending on multiple factors, but largely on the different individual nursing homes conditions. Another conclusion would be that it is possible and effective to introduce interventional nutritional programs.

The role played by the ability of the residents in performing ADL is essential, especially in the case of the ability to eat by him/herself. A study carried out by the Veterans Administration in USA evaluated elderly residents who needed help to eat, and showed that: a) 70% had a BMI below 23, b) 26% had hypoalbuminemia (<3.5 gr/dl), c) 50% had an haematocrit value below 37%, and d) 38% suffered pressure ulcers. Even more, in 88% of cases the daily intake of three or more essential nutrients were under 50% of the Recomended Dietary Allowances (RDA). Only a little group of these subjects received supplements of vitamins or minerals. Similar data were found by the authors in other nursing homes of the country (32).

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Most of the studies assessing serum levels of micronutrients in residents of nursing-homes find important deficits. In a study carried out over a sample of 756 elders (mean age: 83.5 y) living in 26 French nursing homes, micronutrients with low serum levels more frequently found were vitamin C, Zinc, and selenium (33). Similar findings were described in the Netherlands comparing elders living in nursing homes with others living at home (34); or in a nursing-home in Segovia (Spain) with 186 people, where the main deficit was vitamin A (35).

Hyponatraemia is another common problem in nursing-homes. Up to a 18% of hyponatraemic residents has been found in some specific studies on this matter, against only 8% among subjects living in community of the same age and gender (36). Most frequent causes are: inadequate secretion of ADH in relation with different neurologic disturbances, bad use of enteral nutritional supplements in subjects with nasogastric tube, or an excessive intake of fluids.

Demented patients are an important group among residents living in nursing-homes. Along the course of Alzheimer's disease many of then suffer weight loss and undernutrition (37-39). It is a phenomenon that must be known, prevented, and solved by the health personal working in nursing homes.

Protocols and guidelines

A good nursing-home policy requires collaboration among multiple professionals, including geriatricians, nurses, dietists, and therapists. It must be comprehensive, and has to include at least the following points: a) assessment of nutritional status at admission and periodically, b) to provide healthy foods and a well balanced diet, and c) to respond in every case to the nutritional needs of the resident. Questions derived from the heterogeneity of the resident population, with several degrees of disabilities, or chronic concomitant diseases must be taken also into account.

Introduction of RAI in USA proved in only three years a reduction in the prevalence of dehydration and pressure ulcers in nursing homes, both conditions tipically related with nutritional status (11).

In any case we must review some general principles related to diet. I summarize some of them: a) to avoid an uniform diet or forbidden foods in an age-based policy, b) to prepare menus according with the cultural habits of the residents, c) to get an attractive presentation of the foods, d) to divide the diet in a 4-5 daily meals schedule, e) to eat the liquid component of the meals, in order to get profit from their minerals and vitamins, f) to avoid (or to reduce) fried foods, g) to consume fruits and fresh vegetables, h) to drink a minimum of 1.5-2 liters of liquids each day (water, milk, juice, infusions, etc.).

Compared with younger populations the diet in the elderly must be richer in nutrients and lower in energy. Some studies suggest that systemic supplementation with water soluble vitamins improve nutritional status in elderly women (40). However, the best dietetic schedule, or the most appropriate recommendations will never be effective without a correct nutritional educational policy. In this line I can add that there is evidence of the efficacy of training programs directed to nursing home health professionals (41).

In the presence of undernutrition, issues that will have to be included in protocol are: a) to look for and to treat, if possible, the eventual precipitating disease, b) to assess the effects of undernutrition on different systems: weight, blood determinations (haemoglobin, albumine, cholesterol, ...), etc., c) to start an incentivized and supervised open dietetic program, in which it would be allowed to add oral nutritional supplements if necessary, and d) if after one month BMI shows not response or albumin levels are <2.8 gr/dl. to start with enteral nutrition (nasogastric tube)

Specific dietetic corrections may be of benefit in some common chronic diseases. Good examples of possible nutritional interventions in nursing homes could be diabetes mellitus, arterial hypertension, osteoporosis, or patients with coronary or other forms of arteriosclerosis and lipid dysfunctions (42). Early clinical recognition and effective intervention will serve to reduce the negative impact of dehydration on morbidity and mortality (43).

Nasogastric tube or other forms of enteral nutrition do not offer benefits in terms of survival neither in quality of live in patients with dementia (44-46). Main recommendations in these patients are: to divide diet in multiple meals along the day, to give elemental foods easy to swallow, with enough content in calories, macro, and micronutrients, given always with the presence of the caregiver (47).

Enteral nutrition is a good alternative in those residents with problems to ingest enough oral foods to cover his/her daily nutritional requirements. Table 4 shows some indications of enteral nutrition. Absolute contraindications are: total intestinal occlusion, paralitic ileo, and gastrointestinal perforation or haemorrhage; a history of recent surgery, pancreatitis, fistule, or mesenteric infarction are relative contraindication (48).

Percutaneous endoscopic gastrostomy could be an attractive alternative for some of these residents. It is a simple procedure, with few short and long-term complications, without a complex follow up in a nursing home, and with evident advantages in order to maintain an adequate nutritional status in elderly patients (49-50).
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Table 4
Enteral nutrition indications

1. PATIENTS WITH NORMAL GASTROINTESTINAL TRACT

1.1. BY MOUTH: Support or complement
* Difficulties to eat
  - Anorexia
  - Neoplasia
  - Poor teeth
  - Partial aoesofagial stenosis
* Requirements increased
  - Sepsis
  - Trauma
  - Burdens
  - Renal failure

1.2. BY TUBE: Full nutrition
- Neurological diseases with swallowing difficulties
- Neoplasia

2. PATIENTS WITH GASTROINTESTINAL TRACT ANATOMIC IMPAIRED

2.1. BY TUBE
- Aoesophagus cancer
- Short intestinal syndrome

2.2. BY P.E.G.
- Total gastrointestinal stenosis
- Technical difficulties with tube
- Long term needs
- Recent high gastrointestinal surgery

3. PACIENTS WITH FUNCTIONAL IMPAIRMENT OF DIGESTIVE SYSTEM
- Severe hepatic dysfunction
- Acute pancreatitis
- Intestinal malabsorption
- Lower intestinal neoplastic fistula

Reference


