NUTRITIONAL CARE NEEDS IN ELDERLY RESIDENTS OF LONG-TERM CARE INSTITUTIONS: POTENTIAL IMPLICATIONS FOR POLICIES

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Abstract: Objectives: To collect information on actual nutritional intervention requirements in long-term care institutions and on the role of institutional factors in nutritional care. Design: A cross-sectional analysis of baseline data (collected between September 2011 and September 2013) within the context of a multicenter prospective cohort study. Setting: Nineteen long-term care institutions. Participants: Thirteen hundred and ninety-four resident elderly (age ≥60 years). Measurements: The prevalence of nutritional derangements (MNA-Short Form) and the need to introduce nutritional interventions on the residents. Results: Prevalence of malnutrition and risk of malnutrition were 35.2% [95%CI, 32.8-37.8] and 52.6% [95%CI, 50.0-55.2], respectively. Malnutrition was more frequent upon admission and in larger institutions (≥50 beds). Overall, 50% of the residents requiring an individualized nutritional care plan (any type) were not receiving it. Oral diet, the use of fluid thickeners and oral nutritional supplements had to be introduced in 306 (22.5%), 201 (15%) and 175 (13%) residents, respectively. The need to implement the oral diet was mainly due to inadequacy of texture according to chewing and swallowing capabilities. In gender and age-adjusted multivariable logistic regression models, nutritional interventions were associated with worse nutritional status (P<0.001 for all). Moreover, while the duration of stay was unrelated to the need for nutritional interventions, we observed that residents living in larger long-term care institutions (≥50 beds) were more likely to require improvement in nutrition care. Conclusions: In long-term care elderly residents nutritional derangements are very common, underdiagnosed and undertreated. Nutritional screening should be part of routine care. However, also the systematic involvement of a nutritional care specialist appears to be an urgent need, particularly in larger institutions where the standards of care are likely to be lower.

Key words: Long-term care, elderly, malnutrition, risk of malnutrition, treatment.

Introduction

It is known that malnutrition is underreported and undertreated in long-term care institutions. Poor nutritional status may have negative effects on prognosis (1, 2). Although estimates are inconsistent, pooled data analyses from available studies report that the prevalence of malnutrition and risk of malnutrition in institutionalised elderly is about 25% and 50%, respectively (3, 4). Aging appears to be intrinsically associated with nutritional derangements due to multiple comorbidities, a reduction in food intake, changes in hormonal profile (e.g. insulin resistance) and susceptibility to acute diseases (2, 3, 5-9). However, also extrinsic factors should be considered. Among modifiable factors, a key role could be played by nutritional care practices (5-10) as they have proved to improve outcome (11).

In this perspective, several guidelines and recommendations for nutritional screening are now available, with positive screening being an indication for pertinent interventions (5-10). However, although a large body of data on the prevalence of nutritional derangements has been collected by systematic screening procedures (2-4), there is little information on actual nutritional intervention requirements and on the role of institutional factors in nutritional care.

We designed the present study to ascertain the prevalence of nutritional derangements and provide a picture of the type and frequency of new nutritional interventions required in a representative population of institutionalised elderly. In this perspective, the role of structural institutional factors was also investigated.

Methods

Study Design

The present study is part of a wider project taking place in the Italian Piedmont region, which is the one with the highest offer of residential care for people aged ≥65 years (4 beds every 100 inhabitants) (12). In the past nutritional care in this setting was left to the initiative of local healthcare professionals and the presence of an expert in nutrition among local staff never was a priority. In 2007, an expert panel started designing a regional policy for the prevention and treatment of malnutrition in elderly long-term care institutions residents (13). This guideline became operational in late 2010. The approved “global nutritional approach” to all elderly residents includes: 1) the implementation of nutritional screening procedures...
through training programs for local healthcare professionals (nurses and nursing staff) and 2) the implementation of nutritional treatment (from dietary nutritional counseling [oral food of appropriate texture and calorie content with or without the provision of oral supplements] to artificial nutrition) through integration of the consultancy services of an experienced dietician into institutional practices. In particular, the systematic use of the short version of the Mini-Nutritional Assessment (MNA-SF) (14) questionnaire was recommended. The choice of this tool was driven by its good sensitivity, specificity and reliability, and the limited burden in terms of time for its administration – all clear advantages that make it suitable for routine use in standard clinical practice (3, 14).

In order to implement these policies locally after their release, we designed a multicenter, prospective cohort study. A cross-sectional analysis of baseline visit data was the subject of the present study. Baseline data was collected prospectively between September 2011 and September 2013. Long-term care institutions were randomly selected from the list of all government institutions (N=365) located in the provinces of Torino, Cuneo and Asti in the Piedmont region. In total, 19 long-term care institutions were invited and all agreed to participate (Figure 1).

**Figure 1**
Study flow diagram

All residents and newly admitted patients aged ≥60 years were eligible for inclusion. Refusal to give written informed consent (by patient or legal guardian) and terminal illness were the exclusion criteria.

The study was performed in agreement with the principles of the Declaration of Helsinki and the protocol was approved by local Ethics Committees.

**Nutritional approach**

Baseline nutritional assessment by anthropometry was based on body weight, height or knee-height. In particular, weight was measured using a calibrated flat scale (ambulatory patients), a chair scale or a hoist-provided weighing device (non-ambulatory or bedridden patients). Height was directly assessed in those able to stand or estimated from knee height (nonambulatory patients or in case of abnormal spinal curvature) (15, 16). BMI was also calculated (14). Nutritional status was evaluated by the MNA-SF (14). MNA-SF scores range from 0 to 14 points, with scores between 8 and 11 points and <8 denoting patients at risk of and suffering from protein-energy malnutrition, respectively. Short dietary assessment was performed as follows: the amounts of food delivered to and left by the patients at the end of three main meals (breakfast, lunch, dinner) were weighed and recorded by a well-trained dietician (17). Oral intake was then calculated as the percentage of estimated requirements as determined by the Harris-Benedict equation multiplied by a pertinent physical activity factor (18).

Finally, chewing abilities were assessed by the evaluation of the number of teeth and the presence of removable dentures, while screening of swallowing disturbances was performed by the water-swallowing test (19).

Then, nutritional interventions were decided by consensus between a dietician and a doctor specialised in clinical nutrition whenever appropriate according to estimated energy needs and chewing and swallowing capabilities. In respect to this, the choice of the type of intervention to be started was made in agreement with national and international guidelines, moving from dietary counselling (including changes in the texture of oral food and in calorie content of meals), through the use of oral nutritional supplements (ONS) and up to artificial nutrition, considering the enteral route of administration as the most preferable (20-22). Dieticians were primarily involved in the assessment of nutritional status, the identification of patients needing an individualized dietary plan, including the use of ONS, and the improvement in the institutional dietary plan. An investigator physician was directly involved in the prescription of ONS and artificial nutrition.

**Institutional factors and other study covariates**

The head of each institution was interviewed in order to collect data on structural factors. Attention was focused on the total number of beds and care personnel (nurses and nursing staff). The ratio of total residents to staff was calculated for each institution. Therefore, institutions were stratified by applicable quantiles of size (<50 beds; 50-120 beds; >120 beds) and the resident/staff person ratio (<2.5 vs. ≥2.5).

Finally, information on the following covariates was also collected (1, 23): age, gender, admission diagnosis, major comorbidities (diabetes, hypertension, chronic obstructive pulmonary disease, renal failure and pressure ulcers (24)), level of dependence by Barthel Index (25) (dichotomized as totally dependent [score <25] vs. not totally dependent [score ≥25]) and the duration of stay (applicable quantiles: <1 week; ≥1 week and <2 years; ≥2 years). Clinical data were retrieved from medical records or collected through patient interview and physical examination, as appropriate. In particular, dementia diagnosis was based on the criteria reported in the Diagnostic