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Original article

Does undernutrition still prevail among nursing home residents?☆

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SUMMARY

Background & aims: During recent years public awareness about malnutrition has increased and collective initiatives have been undertaken. Simultaneously, the number of older adults is increasing, and the elderly care has been placed under pressure. The aim was to assess the nutritional situation and one-year mortality among nursing home (NH) residents, and compare with historical data.
Methods: Mini Nutritional Assessment-Short Form (MNA-SF), ADL Barthel Index (BI), Short Portable Mental Status Questionnaire (SPMSQ), EQ-5D, Charlson Comorbidity Index (CCI), and blood samples were collected from 172 NH residents (86.3 ± 8 years, 70% women). Mortality data was taken from NH records. Nutritional data from 166 NH residents (83.8 ± 8 years, 61% women) examined in 1996 was retrieved for historical comparison.
Results: The prevalence of malnutrition was 30%, as compared to 71% in the historical data set, corresponding to a present average body mass index of 23.7 ± 5.1 compared with 22.3 ± 4.2 kg/m^2 ($p < 0.01$). Reduced nutritional status was associated with decline in function ($p < 0.001$) and cognition ($p < 0.01$). One-year mortality was 24%. Regression analyses indicated high age (OR = 1.09, 95% CI (1.03–1.16)), high scores in CCI (OR = 1.54, (1.19–1.99)), low BMI (OR = 2.47, (1.14–5.38)) and malnutrition (OR = 2.37, (1.07–5.26)) to be independently associated with one-year mortality.
Conclusions: Malnutrition still prevails and is associated with deteriorated cognition, function and increased mortality. A possible improvement in nutritional status in NH residents over time was observed.

1. Introduction

Nutritional problems among institutionalized older adults have been well documented over the last decades.[1–3] The negative consequences of malnutrition, i.e. morbidity, longer hospital stays,[4] mortality,[5] deteriorated functional ability,[1,2,5] cognitive dysfunction,[1,2] and reduced well-being[2,5] have also been reported in abundance. A recent compilation of international studies from various settings, performed after the year 2000,[6] showed that among 1500 nursing home (NH) residents approximately 14% were classified as malnourished and more than half were at risk of malnutrition. More than a decade ago we reported the nutritional situation of 166 NH residents in three Swedish municipalities.[3] At that time, Mini Nutritional Assessment (MNA) classified 71% as malnourished and 29% as at risk of malnutrition, i.e. none were reported as well-nourished.

Over recent years, national and international authorities and regulatory agencies have recognised the gravity of the situation. Many initiatives have been taken to promote good nutritional practice in elderly care. For example, the resolution on food and nutritional care in hospitals, published by the Council of Europe in 2003, was signed by 18 European countries. The annual European-based initiative of the Nutrition Day project aims at implementing the resolution into daily practice. The recent decision to include NH settings in the Nutrition Day project also reflects the increased awareness of this problem at the municipal care level.[7]

In Sweden, governmental decisions from 2007 onwards have provided incentive grants (altogether >440 million EURO) to municipalities and county councils to improve the quality of elderly care, including nutrition. A further Swedish example of quality improvement on a national level is the introduction of a national quality register, i.e. the Senior Alert, aimed at recording risks and measures taken to prevent and treat malnutrition, falls and pressure sores in caretakers ≥65 years.

Parallel with an increased awareness of nutritional problems in the old and frail population, there is an on-going demographic shift

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towards an increasing number of older adults. For example, 10 years from now >20% of the Swedish population will be >65 years of age and >5% will be >80. In addition, there is a continuous restructuring of elderly care, such as reduced institutionalized care in favour of care provided in the home. Consequently, the care burden increases among elderly care home residents. From 1996 to 2010, beds in special housing decreased by 33,000 concurrent with an increase of 194,000 individuals ≥65 years of age in Sweden.

Under these circumstances there is a relentless need to up-date knowledge of the nutritional situation within the elderly care system in affluent societies. The main objective of this study was to describe the nutritional situation and its relation to subsequent one-year mortality in an NH population in an affluent society in 2010. A secondary aim was to assess if gained knowledge and increasing awareness have made any difference regarding nutritional status among older adults residing in NHs by comparing the present data with historical data from 1996. The hypothesis was that the two trends, i.e. the modernized care and increased care burden, might counter balance each other.

2. Materials and methods

2.1. Study population

The eligible study population was 196 residents in four NH in Uppsala municipality in mid-eastern Sweden. Twenty-one (11%) subjects declined participation in the study and three (1%) were hospitalized, in poor general condition during the data collection or had just recently been admitted to the NH. Thus, in total 172 (88%) residents participated in the study. All ate orally, except one resident who was tube-fed.

The participants were interviewed and examined by one of the researchers (JT). Data collection took place during May 2009 until March 2010. Care staff were interviewed when the participant had cognitive impairments (scoring <5 on the SPMSQ, see below). Birth date, time spent in the nursing home, diagnoses and medications (defined as number of substances) were collected from the medical records at the NH units. Data on mortality one year after the baseline examination were taken from the NH records.

2.2. Nutritional assessment by Mini Nutritional Assessment-Short Form (MNA-SF)

The MNA-SF consists of six items, i.e. questions and anthropometric measures.[8,9] The questions cover the past three months and address food intake and weight loss, mobility, acute diseases or psychological stress and neuropsychological problems. Body Mass Index (BMI) was calculated from height and weight. Height was measured to the nearest 0.5 cm. Whenever possible, standing height was measured with a measuring tape. Otherwise, height was measured lying in bed with a sliding scale. Weight was measured to the nearest 0.1 kg with a digital chair scale or a lift scale. When measurements of height or weight could not be performed, these data were collected from medical records. BMI was calculated (kg/m^2). The maximum MNA-SF score is 14 points. A score of less than 7 points indicates malnutrition, 8–11 points indicates risk of malnutrition and 12–14 points indicates that the person has a normal nutritional status.

For the historical comparison, data on weight, height, body mass index (BMI) and Mini Nutritional Assessment (MNA) was retrieved from 166 NH residents (61% women) examined in 1996,[3] and compared with the present data. MNA-SF was recently validated against the full MNA, and proved to have good sensitivity (0.89) and specificity (0.82), and correlated well (0.90).[8]

2.3. Functional assessment by ADL Barthel Index (BI)

The BI measures the degree of independence in basic self-care in seven areas; feeding, bathing, grooming, toilet use, dressing, bowel and bladder control, transfers from bed to chair and back, mobility on level surfaces and stair climbing.[10] The scores range from 0 to 20, with higher scores indicating greater independence.

2.4. Cognitive assessment by Short Portable Mental Status Questionnaire (SPMSQ)

The SPMSQ consists of 10 items; current date, day of the week, current location, address, age, birth date, name of the prime minister, name of the past prime minister, maiden name of the resident's mother, and the task of counting backward from 20 by threes.[11] Maximum score is 10 points; eight or more errors indicate severe cognitive impairment, 5–7 errors indicate moderate cognitive impairment, 3–4 errors indicate mild cognitive impairment and 0–2 errors indicate normal mental functioning. The SPMSQ test was performed on all participants who were communicable, regardless of their cognitive ability.

2.5. Health-related Quality of Life (QoL) assessment by EQ-5D

The EQ-5D consists of a descriptive system and a VAS-scale.[12] The descriptive system comprises five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has three levels of perceived problems: no problems, some problems, severe problems. Subsequently, the respondent or the proxy is asked to self-rate the state of health on a vertical analogue scale. The VAS scale ranges from 0 to 100, where 100 is rated as "Best imaginable health state" and 0 as "Worst imaginable health state". A proxy version of the instrument was used for the two thirds of residents ($n = 108$) who were not able to answer for themselves due to cognitive impairments, poor general condition, or being non-communicable. EQ-5D index scores were calculated using preference scores generated from a large UK population (UK EQ-5D Index Tariff).[13] EQ-5D index scores range from 0.00 to 1.00, where 0.00 indicates the worst possible health state and 1.00 the best possible health state. Negative scores were given the value of 0.

2.6. Morbidity

Comorbidity was evaluated by the Charlson Comorbidity Index (CCI),[14] which takes into account both the number and the severity of 19 medical conditions, and gives weighted points from 1 to 6. Total scores range from 0 to 37, with high scores indicating more severe comorbidity.

2.7. Biochemical markers

Blood samples from 111 subjects were collected after a 12-h overnight fast. Reasons for not drawing blood from 61 residents were that the resident or their next of kin declined, having a poor general condition as assessed by the nurse at the NH, or that blood sampling was technically difficult. All samples were protected from light, centrifuged and stored at −70 °C until analysis for albumin, CRP, insulin-like growth factor 1 (IGF-1), creatinine and cystatin C using the standard procedures at the Department of Clinical Chemistry at Uppsala University Hospital.