

Original Article

Prevalence of Malnutrition and Use of Nutritional Care Therapy in Rehabilitation Inpatients

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Abstract

Background: Malnutrition is a common and major clinical health problem amongst rehabilitation patients; nevertheless it often remains unrecognized and not treated.

Objective: The aim of the present study was to estimate the prevalence of malnutrition in patients in rehabilitation and to describe nutritional care therapy provision in a Greek Public sub acute rehabilitation unit.

Methodology: 30 patients who were treated in the rehabilitation unit of the General Hospital of Attica KAT were studied. Patients were given an ad hoc questionnaire to complete which was based on ESPEN's Nutrition day questionnaire. At the same time, anthropometric data (weight, height) were collected. The MUST tool was used to determine malnutrition and the risk of malnutrition in each patient.

Results: 30 patients participated in the study (73.3% men) with a mean age of 54 (\pm 17.3) years and BMI 25.4 (\pm 4.1). Based on MUST tool, 33,33% of participants were malnourished, and 6,67% at increased risk of malnutrition. Amongst all participants 11,5% were served a fortified menu and none was offered ONS. A considerable number of rehabilitation patients ate half, little (1/4) or nothing from the hospital food offered (30% for breakfast, 33,3% for lunch and dinner). 13,3% of patients had pressure ulcers. Presence of pressure ulcers was correlated with self-feeding ability Pearson correlation-0,413 (<0,05).

Conclusion: Malnutrition is not seen as a priority in rehabilitation patients; their underlying pathologies and their functional and mobility difficulties take priority. Nevertheless, without proper nutritional care, malnutrition will lead to increased complications such as longer healing time for pressure ulcers and longer recovery stays amongst rehabilitation patients.

Key Words: Malnutrition, Screening, Rehabilitation Patients, MUST score, Oral Nutritional Supplements

Introduction

Malnutrition is a common and major clinical health problem, nevertheless it often remains unrecognized. The frequency of malnutrition and the risk of developing malnutrition are typically high not only in acute care hospital inpatients but also in rehabilitation inpatients.(Barker, Gout, & Crowe, 2011).

Disease related factors (e.g. dysphagia) that reduce intake despite availability, increased nutritional requirements related to disease (e.g. in patients after stroke, spinal cord injury patients) and other factors such as poor quality or/and presentation of foods in the hospital setting, reduce dietary intake and thus lead or worsen malnutrition of rehabilitation patients.(Agarwal, Miller, Yaxley, & Isenring, 2013; Agarwal, Miller, Yaxley, & Isenring, 2013) After hospital or rehabilitation setting admission, deterioration in nutritional status often occurs unless action is taken to prevent it.(Cederholm, et al., 2017) Medical nutrition therapy either in the form of hospital food fortification or by nutritional support (oral nutritional supplements, enteral, parenteral nutrition) is often not used early enough or frequently enough to prevent or treat malnutrition, despite a large and growing evidence base that suggests benefits when nutritional support is used appropriately(National Institute for Health and Care Excellence (NICE). Nutritional support in adults: oral nutritional support, enteral tube feeding and parenteral nutrition , 2006) A close relationship between malnutrition and poor outcome, e.g. increased rates of infections and pressure ulcers, delayed wound healing and increased length of hospital stay are well documented.(Palmero, Serrano Perez, & Chinchertu Ranedo, 2017)

Research question and Hypothesis: The present research aims to describe malnutrition identification and nutritional care therapy provision in a Greek Public sub acute rehabilitation unit. Research objectives are to estimate the prevalence of malnutrition in inpatients admitted to a sub acute rehabilitation unit, to study the association between malnutrition and pressure ulcers, to explore parameters related to development of malnutrition in a rehabilitation setting and to estimate the percentage of patients who were offered ONS or fortified meals/ snacks.

Background: Nutrition is an important modulator of health and well-being in patients on

rehabilitation. Little attention has been paid by the scientific community on nutritional care of rehabilitation patients despite the increased demand for such health services. The prevalence of malnutrition in rehabilitation patients ranges in different studies between 14-65% depending on criteria for malnutrition used and subpopulation examined. (Marshall, Protein-energy malnutrition in the rehabilitation setting: evidence to improve identification, 2016). Especially amongst older rehabilitation patients, the prevalence of malnutrition seems to be especially increased 63%(Yaxley, Crotty, & Miller, 2015)

Malnourished patients demonstrate worse functionality and quality of life after discharge from the rehabilitation unit and they are more likely to need hospital readmission e.g. to an emergency unit in contrast to well nourished rehabilitation patients.(Marshall, Bauer, & Isenring, The consequences of malnutrition following discharge from rehabilitation to the community: a systematic review of current evidence in older adults., 2014). Malnutrition among rehabilitation patients is related to increase length of rehabilitation stay and mortality; consequently nutritional interventions for prevention and treatment of malnutrition are necessary(Collins & Porter, 2015). More specifically, in hip fracture patients in rehabilitation, malnutrition was associated with prolonged rehabilitation time, complications and mortality. (Wyers, Reijven, & Breedveld-Peters, 2018) Current ESPEN guidelines, taken into consideration the above mentioned data propose that older patients with hip fracture in the rehabilitation phase in order to improve dietary intake and reduce the risk of complications as part of an individually tailored, multidimensional and multidisciplinary team intervention in order to ensure adequate dietary intake, improve clinical outcomes and maintain quality of life.(Volkert, et al., 2018) Although, relative research is limited yet, data for specific subpopulations of rehabilitation patients such as rehabilitation patients after a hip fracture, that are previously described, point to the need for in depth and extensive reconsideration of medical nutrition therapy provided to rehabilitation. Another one of the consequences of malnutrition is the development of pressure ulcers. In a study performed in a Greek public hospital investigating parameters associated with development of pressure ulcers in 471 patients,

was concluded that presence or risk of malnutrition as screened by MUST are related to presence of pressure ulcers.(Tsaousi, Stavrou, Ioannidis, Salonikidis, & Kotzampassi, 2015)

Methodology: 30 patients who were treated in the rehabilitation unit of the General Hospital of Attica KAT were administered an ad hoc questionnaire to complete which was based on ESPEN's Nutrition Day questionnaire. In addition to standard screening parameters (low body mass index, non-volitional weight loss, reduced food intake), the questionnaire included other nutrition related parameters increasing the risk of malnutrition at the rehabilitation unit (previous ICU length of stay, dietary restrictions due to presence of chronic disease (adherence to diabetic diet, low sodium diet for hypertension etc), reasons for inadequate meal consumption (meal temperature, small/taste of food provided, difficulties in self-feeding ability, anorexia, chewing problems). Body Mass Index was calculated according to the formula $\text{weight in kilograms} / \text{height in meters}^2$ (height in meters). Height and weight were measured according to standard techniques when possible. If the patient was unable to stand, height was measured using the indirect method of knee height with a sliding knee height calliper according to standard techniques and the use of population-specific formula to calculate height from standard formula (Elderly Italian men 13 [SEE = 4.3cm]=94.87 + (1.58 x knee height) - (0.23 x age) +4.8 Elderly Italian women 13 [SEE = 4.3cm]=94.87 + (1.58 x knee height) - (0.23 x age). (Donini, de Felice, & de Bernadini, 2000)(Rubenstein, Harker, Salva, Guigoz, & Vellas, 2001) The MUST tool was used to determine the risk of malnutrition in each patient.(Elia, Development and use of the malnutrition screening tools for adults, 2003)(Marshall, Protein-energy malnutrition in the rehabilitation setting: evidence to improve identification, 2016) Statistical analysis was performed with the SPSS 23 (IBM, Statistical Package for the Social Sciences).

Results

Out of 30 patients who participated in the study (73.3% men) with a mean age of 54 (\pm 17.3) years and BMI 25.4 (\pm 4.1). The last 3 mths 50% of participants had stable weight, 46.4% lost involuntarily weight and only 3.6% experienced a weight gain.

Based on MUST 33.33% of participants were malnourished, and 6.67% at increased risk of malnutrition. 13.3% of patients had pressure ulcers. Presence of pressure ulcers was correlated with self-feeding ability Pearson correlation-0.413 ($<$ 0.05). No statistically significant correlation was found between presence of pressure ulcers and MUST score, 8% had been previously admitted at an ICU.

As far as provision of fortified meals is concerned, only 11.5% of participants was prescribed such a menu, 84.7% of patients received standard menu, 3.8% (1/30) was fed via gastrostomy and none received ONS. 30.45% of patients were very satisfied with food served, 21.7% were satisfied, 21.74% were neutral, 21.7% were dissatisfied and 4.3% very dissatisfied. 14.8% experienced limited self-feeding ability and thus received help for food consumption from relatives and nursing staff.

As far as food consumption is concerned, 70% of patients consumed almost all their breakfast, 20% consumed half, 10% consumed very little ($<$ 1/4) or nothing. 66.7% of patients consumed almost all their lunch, 20% consumed half, 13.3% consumed very little ($<$ 1/4) or nothing. 66.7% of patients consumed almost all their lunch, 13.3% consumed half, 20% consumed very little ($<$ 1/4) or nothing. 60% of patients consumed food that was not offered by the hospital. Amongst them, 29% consumed home prepared meals by relatives, 24% extra fruits, 12% salty snacks, 10% sandwiches, 5% fast food meals, 5% milk products. 21% of patients consumed fruit juices, 13% milk, 12% coffee, 6% tea and 3.7% cola drinks.

MUST score was related with breakfast consumption Pearson correlation 0.468 ($<$ 0.01).

Amongst patients consuming little ($<$ 1/4) or nothing, 30% declared that they did not like the kind of food offered, 30% that they did not like the smell/ taste, 25% that had anorexia, 5% had problems chewing/ swallowing and 5% that the food offered was not adhering to their religious beliefs.

Discussion

Our research findings relatively to prevalence of malnutrition (33.3% of patients classified as malnourished (MUST score 2 or more) and 6.7% classified as at risk of malnutrition (MUST score

1) are in accordance with the existing literature. It is important to underscore that "risk of malnutrition" as it is identified by the screening tools is in itself a condition related to increased morbidity and mortality (Cederholm, et al., 2017)(Jensen & Cederholm, 2018) Malnourished and at risk of malnutrition are approximately 40% of patients in a rehabilitation unit. Nevertheless, due to different screening tools used, malnutrition in rehabilitation patients ranges between 14-65%.(Marshall, Protein-energy malnutrition in the rehabilitation setting: evidence to improve identification, 2016)

According to our findings mean BMI of research participants was 25.4 (SD 4.1). Other researchers have reached similar conclusions mean BMI 26.7 ± 4.9 kg/m² (Doundoulakis, Poulia, & Antza, 2018), and $25.0 + 5.7$ kg/m²(Marshall, Protein-energy malnutrition in the rehabilitation setting: evidence to improve identification, 2016) as far as BMI in rehabilitation participants are concerned. There is substantial regional variation in the use of the BMI as a phenotypic criterion for malnutrition and a confounding variable among rehabilitation patients are that a subpopulation of this patient group namely spinal cord injury patients have increased risk of demonstrating obesity after discharge from the rehabilitation unit in the long term. Moreover, Body Mass Index (BMI) underestimates overweight/obesity in individuals with SCI due to lower muscle and bone mass and higher percentage of body fat. More specifically limited research conducted in individuals with SCI suggests that a BMI >22 kg/m² is considered a high risk for overweight/obesity and obesity-related chronic disease. (Eriks-Hoogland, et al., 2011).

In individuals who are identified as malnourished or at risk of malnutrition by screening, a comprehensive nutritional assessment should follow, providing information on kind and severity of malnutrition and its underlying causes as well as on individual preferences (regarding food and beverages and resources (e.g. chewing and swallowing ability, eating dependence, gastrointestinal function, severity of disease, general prognosis) for nutritional therapy. (Volkert & Schrader, Dietary assessment methods for older persons: what is the best approach?, 2013)(Volkert, et al., 2018)

Dietary counseling, food fortification, additional snacks and ONS are options to increase daily

dietary intake by the oral route. (Baldwin, Kimber, Gibbs, & Weekes, 2016) According to evidenced based recommendations hospitalized patients with malnutrition or at risk of malnutrition should be offered ONS, in order to improve dietary intake and body weight, and to lower the risk of complications and readmission.(Volkert, et al., 2018) Compared to usual care, high protein ONS demonstrated a range of effects across settings and patient groups including reduction in mortality of up to 24% vs standard care(Cawood, Elia, & Stratton, 2012), reduction in complication rates vs routine care (Milne, Potter, & Vivanti, 2009) and weight gain (Stratton, Hebuterne, & Elia, 2013). The results of the present study confirm previous findings that pinpoint to the reality that nutritional support in the form of ONS is often not used early enough or frequently enough to prevent or treat malnutrition, despite a large and growing evidence base that suggests benefits when nutritional support is used appropriately. (Nieuwenhuizen, Weenen, Rigby, & Hetherington, 2010) The limited use of ONS may be attributed to frequent lack of interest in nutrition on behalf of health professionals, to inadequate referrals to dietitians, to inadequate training and knowledge of doctors and nurses in nutrition, to lack of resources or inadequate management of nutrition services in the hospital setting. (Vanderwee, et al., 2011) This is increasingly an issue as current economic constraints mean budget holders may choose to withhold prescribed nutritional care, failing to recognize that greater costs result when leaving malnutrition untreated (namely, increased costly hospital admissions and complications such as infections and pressure ulcers). (Elia, Normand, & Norman, A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in the hospital setting, 2016)

There is a correlation between pressure ulcers and self-feeding ability Pearson correlation-0.413 (<0.05). 50% of patients with pressure ulcers received help by relatives or nursing staff for feeding, since they experienced difficulties in self feeding ability due to hemiplegia or spinal cord injury. Limited self feeding ability may lead to impaired energy and protein intake. Prolonged inadequate protein intake may promote tissue oedema, which delays healing by slowing oxygen diffusion from capillaries to cell membranes. Metabolic demands rises in the

presence of a wound due to greatly increased cell activity in the region. Optimum nutrition is a key factor in maintain all phases of wound healing. Protein energy malnutrition in the presence of a wound leads to loss of lean body tissue or protein stores, which impedes the healing process. (Joan, 2015)

We identified that a considerable number of rehabilitation patients ate half, little (1/4) or nothing from the hospital food offered (30% for breakfast, 33.3% for lunch and dinner). This finding is in accordance with relevant references that report that between 30 to 50% of hospital food is wasted and average food intakes are less than 75% of that recommended, particularly among the elderly.(Joan, 2015) This impairs clinical outcome and wastes resources. Recent studies, provide strong evidence that measures such as improved staff training, nutritional screening and assessment, and monitoring, combined with better catering practices, can result in most patients' nutritional requirements being met. Moreover, despite the fact that according to our findings 33.33% of participants were malnourished, and 6.67% at increased risk of malnutrition, only 11.5% of them were prescribed a fortified menu and none ONS. Fortified meals, between meal snacks and adequate ward staffing have all been shown to contribute to achieving this goal, which leads to better clinical outcome, less waste, shorter hospital stay and a more cost-effective service.

Conclusions: Malnutrition is not seen as a priority in rehabilitation patients; their underlying pathologies and their functional, mobility difficulties take priority. Nevertheless, without proper nutritional care, malnutrition will lead to increased complications such as longer healing time for pressure ulcers and longer recovery stays amongst patients. Our findings complement existing literature and pinpoint to the need for better nutritional care of rehabilitation patients. Better catering and feeding may be slightly more costly, but this is justified in the interests of the quality of care and a better clinical outcome. All aspects of nutrition, including hospital food and oral supplements overlap and are interdependent. Assistance with eating must be provided, and special utensils provided where necessary. A range of meals specially fortified in energy and protein should also be available in every hospital and prescribed accordingly to all at risk or malnourished patients, and snacks and

nourishing drinks should be kept on the ward and routinely offered between meals. Moreover proprietary oral supplements where clinically indicated should be offered, since they can be extremely effective means of achieving nutritional goals and improving clinical outcome.

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