



Applied nutritional investigation

## Early nutritional support and physiotherapy improved long-term self-sufficiency in acutely ill older patients



Petra Hegerová M.D. \*, Zuzana Dědková M.D., Luboš Sobotka M.D., Ph.D.

Third Department of Medicine, Medical Faculty and Faculty Hospital Hradec Kralove, Charles University, Prague, Czech Republic

### ARTICLE INFO

#### Article history:

Received 20 January 2014

Accepted 5 July 2014

#### Keywords:

Self-sufficiency  
Nutrition  
Lean body mass  
Elderly

### ABSTRACT

**Objective:** An acute disease is regularly associated with inflammation, decreased food intake, and low physical activity; the consequence is loss of muscle mass. However, the restoration of muscle tissue is problematic, especially in older patients. Loss of muscle mass leads to further decrease of physical activity which leads, together with recurring disease, to the progressive muscle mass loss accompanied by loss of self-sufficiency. Early nutrition support and physical activity could reverse this situation. Therefore, the aim of this study was to determine whether an active approach based on early nutritional therapy and exercise would influence the development of sarcopenia and impaired self-sufficiency during acute illness.

**Methods:** Two hundred patients >78 y were admitted to a hospital internal medicine department and participated in a prospective, randomized controlled study. The patients were randomized to a control group receiving standard treatment (n = 100) or to an intervention group (n = 100). The intervention consisted of nutritional supplements (600 kcal, 20 g/d protein) added to a standard diet and a simultaneous intensive rehabilitation program. The tolerance of supplements and their influence on spontaneous food intake, self-sufficiency, muscle strength, and body composition were evaluated during the study period. The patients were then regularly monitored for 1 y post-discharge.

**Results:** The provision of nutritional supplements together with early rehabilitation led to increased total energy and protein intake while the intake of standard hospital food was not reduced. The loss of lean body mass and a decrease in self-sufficiency were apparent at discharge from the hospital and 3 mo thereafter in the control group. Nutritional supplementation and the rehabilitation program in the study group prevented these alterations. A positive effect of nutritional intervention and exercise during the hospital stay was apparent at 6 mo post-discharge.

**Conclusions:** The early nutritional intervention together with early rehabilitation preserves muscle mass and independence in ill older patients hospitalized because of acute disease.

© 2015 Elsevier Inc. All rights reserved.

### Introduction

Due to improved medical care, life expectancy is increasing. According to data from Eurostat database EU-27, life expectancy reaches 76.7 y for men and 82.6 y for women in the European Union. However, the aging process very often is accompanied by a loss of independence and the subsequent need for help from near relatives or community. In some older individuals, nearly 25% of their lifetime is spent in conditions of disability. The reason for this decline is apparently complex. The weakening of

the somatic condition because of accumulation of chronic and degenerative diseases, gradual decline of mental functioning, and loss of skeletal muscle mass are responsible for the loss of independence. The deficit of muscle mass is usually both a permanent and continual process associated with aging [1]. However, this does not mean that muscle wasting is an inevitable part of the aging process. More likely, it is a cumulative result of recurring subsequent acute disease, because the subsequent restoration of physical improvement and muscle mass is time consuming, very difficult, and often impossible in older individuals [2]. This situation results in continuing but progressive decrease of muscle mass and subsequent loss of self-sufficiency, requiring some older patients to be institutionalized in hospitals or nursing homes.

The project was supported by research grant PRVOUK P 37-12.

\* Corresponding author. Tel.: +420 604 412 677.

E-mail address: [petra.hegerova@fnhk.cz](mailto:petra.hegerova@fnhk.cz) (P. Hegerová).

Acute illness is regularly associated with an inflammatory reaction that is essential for both disease survival and subsequent regeneration and recovery. Metabolic reactions connected with inflammation are characterized by increased energy expenditure and changes in substrate metabolism [3], which result in mobilization of body protein especially from skeletal muscle [4]. Extensive skeletal muscle catabolism is apparently essential for delivery of energy and other indispensable substrates in the resolution of acute disease [3,5]; however, it finally leads to a significant loss of body musculature. Moreover, a reduction of physical activity as a result of immobilization and negative energy and protein balance resulting from decreased food intake contribute to the additional loss of skeletal muscles during acute illness.

Nutrition problems are common in older individuals [6] and are associated with the previously mentioned catabolic factors during acute disease or surgery. The etiology of malnutrition principally involves factors that may be changed and influenced; insufficient food intake is central in this aspect. Of institutionalized older patients, 44% did not consume enough energy-rich foods to meet the recommended intake in one Spanish study [7]. In a Turkish study, poor nutritional status was found in 44% of older patients admitted to a clinic in 1 y (13% malnutrition, 31% at risk for malnutrition according to the Mini Nutritional Assessment test) [8]. In a Belgian study that included 2329 older hospitalized patients, 33% suffered from malnutrition, nearly 43% were at risk for malnutrition, and only 24% were well nourished [9]. Moreover, insufficient nutritional intake often is combined with a history of acute or current chronic disease—the so-called disease-related malnutrition [10].

A quantity of skeletal muscle mass is essential for the recovery from acute illness. A recent meta-analysis demonstrated a positive relationship between muscle strength and clinical outcome in patients after liver transplantation [11]. Skeletal muscle is a source of substrates essential for disease survival and the healing process, as well as for the subsequent period of recovery. The remaining muscle mass is also crucial for salvation of quality of life after cure of an acute disease [12]. Because physical activity decreases with age and the amount of muscle mass is dependent on muscle function, the protein depots are usually lower in this population. Without nutrition and adequate physical exercise, the skeletal musculature further fades away. Additionally, during hospitalization for an acute illness, the food intake and physical activity of a geriatric patient are even more reduced. Significant loss of skeletal muscle mass (particularly in the lower extremities) due to 10 d of bed rest was detected in a group of 12 healthy and moderately active patients with mean age 67 y [13]. The loss of lean tissue was more profound in older patients after 10 d than in younger individuals after 28 d [14]. The decline of protein synthesis and muscle strength due to 14 d of inactivity was counteracted by moderate-resistance exercise [15].

It is obvious that bed rest and physical inactivity lead to decreased muscle mass, muscle strength, and muscle protein synthesis [13]. It is also known that immobilization combined with inflammation and undernutrition leads to further loss of muscle mass and function; this is frequent in acutely ill older patients during a hospital stay. Older patients who were able to perform only moderate physical activity before the onset of an acute illness were prone to completely lose their self-sufficiency despite only relatively small decreases of skeletal musculature. The regain of muscle mass and function needs prolonged and complicated rehabilitation, which is frequently difficult or even impossible in this patient group. Because of these circumstances,

**Table 1**

Characteristics of study patients (no significant differences between groups)

	Patients, n	Nutrition risk screening	Age (y)	Weight (kg)
Control group	100	2.22 ± 0.75	83.2 ± 3.8	74.4 ± 14.1
Intervention group	100	2.3 ± 0.61	83.6 ± 3.8	72.3 ± 13.3

an acute disease in an older individual is almost always connected with a loss of self-sufficiency and increased need for aftercare both at home and in institutional settings.

It has been demonstrated that sip feeding applied in older patients may have a positive effect, especially during hospitalization and in the acute phase of disease. Results from a Swiss study proved that medical patients at nutritional risk profit from nutritional support in terms of nutritional status, quality of life, complication incidence, and repeated hospitalizations even with only a short period of hospital stay [16]. Another intervention study involved 445 hospitalized older patients who received normal hospital diet plus either 400 mL of nutritional supplement or placebo daily for 6 wk. The results showed that oral nutrition supplements improved nutritional conditions and led to a statistically significant reduction of unscheduled hospital readmissions [17]. These results make it clear that, especially in geriatric patients, complete recovery could depend on nutritional support and early physical activity. However, to our knowledge, the combination of nutritional support and early physiotherapy has not been studied so far.

The aim of our study was to assess whether it was possible to influence the loss of muscle mass in acutely ill patients by an active approach based on nutritional support and early physiotherapy, thus extending their self-sufficiency and improving their quality of life. Secondary objectives of the study were to determine the tolerance of sipping and its effect on spontaneous food intake during hospitalization.

## Patients and methods

### Inclusion and exclusion criteria

This prospective randomized study was organized at the Third Internal Department of Metabolic Care and Gerontology, Faculty Hospital in Hradec Králové. Inclusion criteria included age >78 y, admission to the hospital as a result of acute illness, self-sufficiency of the patient before admission based on a Barthel Index (BI) score >60 [18], and patient's consent to participate in the study. Exclusion criteria were terminal stage of disease, terminal organ failure, hospitalization in the previous 3 mo or more than two hospitalizations in the previous 6 mo, indication for immediate nutritional support (recent weight loss, reduced food intake of <50% of the normal amount for more than 2 d before admission, and body mass index [BMI] <18.5 kg/m<sup>2</sup>), low self-sufficiency before the acute disease (BI ≤ 60), advanced stage of dementia associated with loss of independence, and refusal to participate in the study.

### Randomization of the patients and study protocol

Patients selected for the study were randomized by the method of sealed envelopes. The intervention group (IG; n = 100) received nutritional sip supplements from day 1 of hospitalization. Physiotherapy was also initiated on day 1. Rehabilitation and nutritional support continued during the entire hospital stay.

**Table 2**

Disease characteristics of study patients

	Cardiac disease	Infection	Kidney disease + metabolic disease	Gastrointestinal disease
Control group (n = 100)	42	33	11	14
Intervention group (n = 100)	43	35	14	8

Download English Version:

<https://daneshyari.com/en/article/6089521>

Download Persian Version:

<https://daneshyari.com/article/6089521>

[Daneshyari.com](https://daneshyari.com)