

APPLICATION OF NRS 2002 METHOD IN NUTRITIONAL RISK ASSESSMENT OF ELDERLY PATIENTS HOSPITALIZED IN VARAŽDIN GENERAL HOSPITAL

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Abstract

Increasing incidences of nosocomial infections, prolonged hospitalizations, higher treatment costs are sufficient reasons for the need for early and effective interventions aimed at prevention, and then treatment of the causes of malnutrition among the elderly. Research conducted on the Croatian population proves that nutritional risk increases with age and that age is an independent predictor of length of hospital stay. Prevention of malnutrition in hospital patients must be a priority for all health professionals and requires multidisciplinary collaboration. The aim of the study was to detect how many hospitalized patients are at nutritional risk.

We examined 66 patients with a lower age limit of 65 years hospitalized in the General Hospital Varaždin in Republic of Croatia for a period of 3 months. The standard Nutritional Risk Screening method from 2002 (NRS 2002) recommended by the European Society of Clinical Nutrition and Metabolism (ESPEN) was used to assess both nutritional status and risk of elderly patients. The obtained data were analyzed by the statistical program SPSS 23 from IBM with a descriptive and graphical representation.

Of the total number of subjects, 70% of them were exposed to nutritional risk and required nutritional support, while it was needed for 30% of subjects to repeat nutritional screening once a week. In the group of patients with malignant disease, as many as 89% of patients were at nutritional risk ($NRS \geq 3$), which is a difference compared to the group of non-malignant patients. The nutritional status of patients generally deteriorates if they suffer from a malignant disease that progresses intensively.

Numerous studies show that malnutrition is a common problem among the elderly, and the simplest way to solve this problem is to introduce a routine method of assessing nutritional status for all elderly who are at increased nutritional risk from the very admission to the hospital.

Key words: *Elderly population, Oncology patients, Nutritional risk assessment, NRS 2002.*

1. Introduction

The complexity of the assessment of the nutritional status in elderly people presents a still insufficiently researched and studied part of contemporary health care for geriatric patients in the area of gerontnutrition. Hospitalized elderly patients are a specific group when there is an effort to collect the data about their nutritional status. Despite the complexity of the process of assessing the nutritional status and the specificity and difficulty of approaching a geriatric patient during the assessment, the measurement of the nutritional status is part of the basic care and health support for the patient. The use of these methods demands an interdisciplinary approach from different areas of geriatrics, and the development of specialized expert profiles which are especially useful in assessing the functional nutritional capability of each patient. The individual approach, the nutritional assessment and support as part of nutritional care are a difficult and continuous process which are only yet to be recognized as an important factor in the monitoring of the patients in the hospital system. The nutritional risk for patients has its price, and this price can be decreased through interventions in due time and by

determining the nutritional status, that is, discovering undernourishment.

The nutritional status is defined through a number of mutually connected factors, and it is determined through the synthesis of information collected through different methods [1]. Because of the increased incidence rate of undernourishment, experts have been trying for years to develop simple and effective tests for discovering undernourishment among the general, as well as the hospitalized population. In order to do that, besides anamnestic data about appetite and food consumption, researchers also use objective methods, like anthropometric measurements, laboratory parameters, clinical examinations, functional tests and questionnaires [2, 3].

When approaching the assessment of the nutritional status, the first step is to conduct a short screening with the help of some of the standardized forms, after which a comprehensive extensive assessment of nutritional status is conducted on patients who have proved to be at nutritional risk. These forms mostly contain questions about accidental weight loss and BMI, diet habits and functioning status. The purpose of such screenings is to determine undernourishment and, if needed, to give the patient nutritional support [1]. Undernourishment which is connected to malnutrition is an additional medical difficulty which demands detection in due time as it affects the treatment and the length of the hospitalization, leads to an increased risk of a deadly outcome, delays recovery and increases the costs of treatment [2, 4, 5 and 6]. It is a frequent problem in patients with chronic and severe diseases, and the frequency of hospital undernourishment ranges from 20% to 50%, depending on the assessment criteria, while approximately 65% of the elderly hospitalized population is exposed to malnutrition [2, 7]. The outcome of the nutritional support is the improvement and the prevention of the loss of the mental or physical function, as well as the decrease in the number of the mentioned complications connected to the illness or its treatment [8].

The aim of this paper was to discover in what degree undernourishment is present in hospitals, with the goal of showing the importance of discovering undernourishment in due time by sorting patients into groups according to the risk of the nutritional status and the severity of the disease. This paper has a critical approach and can be considered to be a basis for further research in the area of gerontnutrition.

2. Materials and Methods

The research assessing the nutritional risk of the elderly hospitalized population included patients from the

Varaždin General Hospital in the Republic of Croatia and it was conducted in March and April 2018. The representative sample consisted of 66 examinees with the lower age limit of 65 years and all the examinees agreed to take part in the research anonymously and voluntarily. 37 of the examinees were male while 29 examinees were female. The average age of the male and female examinees was 73. The questioned patients were hospitalized at the departments of endocrinology, oncology and hematology, gastroenterology, infectology, pulmonology, and the department for long-term care and rehabilitation.

The basis of the research were anthropometric data, and patients whose weight and height could not be measured were excluded from the study. For the assessment of the nutritional risk, we used a standardized method for nutritional screening recommended by NRS 2002 whose purpose is to identify undernourishment in patients in hospitals [1]. The sex and age of every examinee was recorded, as well as their height in meters and their weight in kilograms.

From the obtained data, we calculated the BMI of every patient. The method of nutritional screening consists of two parts. In the initial part, answers to four simple questions are required: Is the examinees BMI smaller than 20.5; did a loss in body mass occur in the last three months; has food intake reduced in the last week; and is the examinee severely ill. If the answer to any of the four questions is affirmative, the second part of the questionnaire follows which considers the nutritional status assessment with more detail. Based on all of the collected data, the patient is classified as being exposed to nutritional risk, or it is recommended to track the nutritional status once a week [2].

3. Results and Discussion

The used method contains, among others, two very important pieces of data, and those are the patients BMI and the classification of the unintentional loss of body mass of more than 5% for a period of one, two or three months. In the sample of 66 examinees, 20 of them (30%) have not been at nutritional risk, but the screening had to be repeated once a week, while 46 (70%) of the examinees have been at nutritional risk and because of that required nutritional support. We find similar results in other studies conducted on hospitalized patients in Croatia in which we see a similar trend of an increasing number of patients at nutritional risk in the hospital system. We have to pay attention to the fact that every fifth patient in the hospital is exposed to nutritional risk and that most of them do not get any nutritional support while research confirms that most of the hospitalized population is older than 65 (53.6%) [9]. The prevalence of

undernourishment at admission to hospital is 19.4%, and in that group, most of the patients (76.8%) are part of the elderly population [7]. Although there is not a significant difference in the frequency of undernourishment in elderly patients compared to younger patients, the loss of body weight is still more common in elderly patients with an emphasize on a longer hospital stay. [10] This is also confirmed by the results of the conducted research in which more than a half of the examinees (62%) lost weight in the period of 3 months before hospitalization. The similarities of the conducted research and other research can also be found in the highest number of undernourished patients among gastroenterological [11] and pulmonary patients [7].

Further on, similar results were obtained in a study conducted on 65 hospitalized people in the palliative care unit in which the NRS 2002 method was conducted separately on each patient. The research included questions about diet, the length of the hospital stay, the outcome of the treatment and the return back home. The connection of the NRS 2002 results with a deadly outcome and morbidity showed that there is a significant difference in the survival rate between cancer patients which were at nutritional risk at admission to the hospital compared to those who were not [5]. In our research, 19 (29%) of the examinees had a malignant disease, while 47 (71%) of them had a non-malignant disease. In the group of people with malignant diseases, only 2 (11%) examinees were not at serious nutritional risk, while the remaining 17 (89%) examinees were at serious nutritional risk. In the group of people with non-malignant diseases, 18 (38%) patients were at mild nutritional risk (NRS < 3), and 29 (62%) were at risk and, as that, required nutritional support. Patients with malignant diseases were significantly more often at nutritional risk (NRS \geq 3) and they were, therefore, at a significantly higher risk of undernourishment when compared to patients with non-malignant diseases. Malnutrition and the loss of muscle mass in elderly people occurs more often in patients with malignant diseases which negatively affects the clinical outcome. An inadequate food intake, a decrease in physical activity and a metabolic disorder can additionally worsen malnutrition and the loss of muscle mass, and to prevent it in due time, it is important to monitor the treatment process at the same time as the assessment of nutritional risk [12]. The results of the research conducted in other clinical institutions confirm that malignant diseases are the first risk factor for the development of undernourishment in patients in hospitals. Studies show that patients with diabetes, especially elderly oncological patients, are at high undernourishment risk, that is, more than 30% of oncological patients and more than 40% of oncological patients older than 70 are exposed to the risk of undernourishment at admission to the hospital [13].

Undernourishment is very common in patients that have been admitted to the hospital with other comorbidities and oncological diagnoses, and scientists recommend the NRS 2002 method as the most reliable tool for the quick detection of the nutrition rate [14, 15]. On the sample of 1,075 patients admitted to the hospital, with an average age of 67.9 years, more than half of them were at nutritional risk, and this risk was connected to significant comorbidities such as respiratory and kidney insufficiencies, urinary infections, hypoglycemia, intestinal fail etc. Researchers emphasize the need to establish preventive and therapeutic monitoring of the patients' diets that affect the complications rate which can this way be reduced, as well as the costs connected to these complications [15]. The cause of a progressive weight loss in oncological patients can be found in tumor cachexia which uses proteins from muscle tissues as a source of energy, and this results in a worse functioning of different organs and organ systems, and, finally, the body as a whole [16]. In our research, out of the 19 examinees that had a malignant disease, 11 of them lost more than 5% of their body mass in the last three months before the hospitalization, and the cause of this was tumor cachexia. Among the patients that had a malignant disease, there is a stronger correlation between the nutritional status and the pathophysiology of the disease, and we have therefore come to the assumption that patients with a malignant disease will more often be undernourished.

We have started this research with this assumption and it has been confirmed with the given results. The group of patients with malignant diseases has especially been emphasized with this paper, and, based on the results of this questioned group, it has been concluded that measuring only the body mass index is not enough to assess the nutritional status of elderly cancer patients, but that considering other parameters and a detailed monitoring of the nutritional status of the patients is crucial as well. Distribution of all of the examinees according to sex, malignant or non-malignant diseases and the number of the examinees according to the NRS scale for nutritional risk is presented in Table 1.

Table 1. The distribution of all of the examinees according to sex, malignant or non-malignant diseases and the number of the examinees according to the NRS scale for nutritional risk

	N	Malignant disease	Non-malignant disease
M	37 (56%)	11 (30%)	26 (70%)
W	29 (44%)	8 (28%)	21 (72%)
TOTAL	66	19	47
NRS < 3	20 (30%)	2 (11%)	18 (38%)
NRS \geq 3	46 (70%)	17 (89%)	29 (62%)

Legend: N - number, M - men, W - women, NRS - Nutritional Risk Screening

Considering the data from the Table 1, that shows that 89% of the examinees with a malignant disease are at nutritional risk, we can conclude that this group needs nutritional support as soon as possible, which would significantly affect the decrease of the risk status of the examinee.

For the majority of patients suffering from malignant diseases, the $NRS \geq 3$ (Figure 1) which required nutritional support. It is extremely important to supplement energy needs, vitamins and minerals using parenteral, enteral or a combination of both techniques [6].

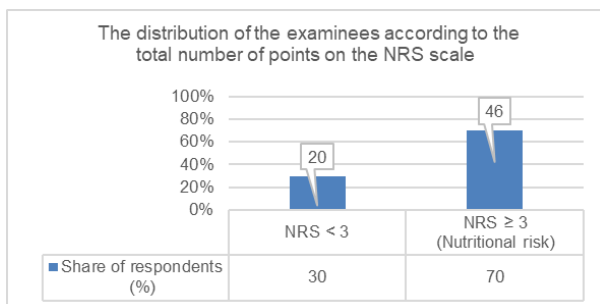


Figure 1. The distribution of the examinees according to the total number of points on the NRS scale

4. Conclusions

- The obtained results of the research show that the NRS 2002 nutritional risk screening test, which was used, is adequate and very effective in assessing the nutritional status of the elderly hospitalized population.

- Nutritional status of elderly people is based on numerous changes and it is a very important factor which influences the outcome and the recovery from the disease or the injury. For persons older than 65, the nutritional status has to be checked routinely once a year, and for persons older than 75 even more often [17].

- It is important to point out the fact that undernourishment is present in the elderly population which has a very high chance of being at nutritional risk after starting hospital treatment because of the process of ageing. Through a comprehensive insight into the nutritional status of elderly patients it is possible to face the problem of nutrition in elderly people and that way significantly influence the improvement in the treatment of elderly people, the decrease in costs and the length of the hospitalization, the decrease in deadly outcomes, and, with that, also the quality of life of elderly people.

- Given results of the research show that the used nutritional risk screening test is adequate and very effective in detecting undernourishment in people with malignant diseases. Because of its simplicity, this test can be conducted by all health workers in the hospital system (doctors, nurses and nutritionists) while

they are working with their patients every day. The detection of undernourishment among hospitalized patients is of crucial importance and it is the first step towards providing further nutritional care that should improve the outcome of the disease and the quality of life of every nutritionally endangered patient.

- At the end of the interpretation of this research paper, it is important to point out the fact that we can also find undernourished individuals in the general population which develop an even higher rate of undernourishment after starting hospital treatment. Because of an inadequate amount of attention focused on improving the bad nutritional status of these individual, soon after entering the hospital we can notice the emergence of malnutrition, as well as the emergence of systematic metabolic changes which aggravate the outcome of further treatment. From everything stated, we can conclude that it is necessary to notice already the first sign of undernourishment in patients, react to it and then treat it adequately.

- Furthermore, it has been proven through this paper that it is important to monitor the nutritional status of the patient through the whole process of hospitalization. Through this, we have a possibility to monitor it more correctly and notice certain metabolic changes which enables us to treat them and intervene adequately in time.

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