

Evaluation of the nutritional status of patients hospitalized in a university hospital

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Abstract

Aim: Malnutrition is a common condition in hospitalized patients. This study aimed to evaluate the nutritional status of patients hospitalized in the Recep Tayyip Erdoğan University Medical Faculty Training and Research Hospital and to determine physicians' awareness of this issue.

Methods: In this study, patients hospitalized in different wards were evaluated prospectively. The 485 patients over the age of 18 who were hospitalized in different wards were included in the study. The chronic disease history of the patients was evaluated. The patients were evaluated twice, at admission and on the 7th day of hospitalization. Height, weight, body mass index, and upper arm circumference were measured with the NRS 2002 (Nutritional Risk Scoring) screening test to determine the nutritional status of the patients. Descriptive statistical methods were used in the evaluation of the data, and the chi-square test was used in the comparison of qualitative data ($p < 0.05$).

Results: Of the patients included in the study, 42% were female and 58% were male. There was no statistical difference in the comparison of the presence of malnutrition by gender. According to the first NRS 2002 measurements of the patients, malnutrition was not found in 78.1% of all patients, while the presence of malnutrition was found in 21.9% of the patients. 100 of the 105 patients with malnutrition were found to be over 65 years old. According to the second NRS 2002 measurements, while 31.2% of patients over 65 years of age had malnutrition, 3.1% of patients under 65 years of age had malnutrition.

Conclusion: The rate of malnutrition increased as the presence of chronic disease and age increased. It was seen that most of the patients who were found to have malnutrition in the first evaluation were not provided with nutritional support, and the rate of noticing and treating malnutrition by physicians was not sufficient.

Keywords: Nutrition, malnutrition, hospitalized patients, chronic disease, body mass index, BMI

Introduction

Malnutrition can be defined as inadequate, excessive, or unbalanced energy intake [1, 2]. Malnutrition is characterized by compromised bodily structure, function, and clinical outcome due to excess, deficiency, or imbalance of energy, protein, and other essential nutrients [1, 3, 4]. It is prevalent and on the rise among the elderly and is correlated with an increased risk of morbidity, decreased bone mass, impaired muscle function, and diminished cognitive function; at present, 16% of those aged 65 and above and 2% of those aged 85 and above are classified as malnourished [1, 3, 4].

Although the rate of overweight and obesity in the world population is increasing due to ongoing economic development, unbalanced nutrition is still mostly understood as inadequate nutrition [5, 6]. The quality, quantity, and calorific value of food and eating habits are important factors affecting general health status [7, 8]. The prevalence of malnutrition in the elderly is increasing in the elderly living in health institutions or in nursing homes. Twenty percent of the elderly are affected by malnutrition [9, 10]. 5-8% of the elderly aged 65 years and older have malnutrition [11]. This rate increases up to 20-40% in those in health institutions. Fifteen percent of the elderly aged 65 years and over live in the home environment, 23 to 60 percent in hospitalized elderly, and up to 85 percent in nursing homes [12, 13]. These results show that all individuals reaching the age of 80 years encounter symptoms of malnutrition to varying degrees regardless of their socioeconomic status [14, 15]. Biological, physiological, mental, social, and economic risk factors are all responsible for the occurrence of malnutrition [10, 16].

Malnutrition is associated with decreased functioning of an organism, loss of bone mass, immune dysfunction, anemia, impaired cognitive function, prolonged wound healing, slow recovery after surgery, repeated hospitalization, or increased mortality [1, 17]. Numerous adverse health effects, including anemia, immune dysfunction, decreased bone mass, impaired muscle function, diminished cognitive function, poor wound healing, delayed recovery from surgery, and increased mortality, are associated with poor dietary habits among older individuals [Ahmed, 1, 17].

The development of the Mini Nutritional Assessment (MNA) aimed to assess the nutritional status of the elderly [17-21]. Several studies have indicated that enhancing the predictive power of the MNA for nutritional status among older Taiwanese individuals could be accomplished through the adoption of population-specific cut-offs for body mass index (BMI), calf circumference (CC), and mid-arm circumference (MAC) [22-24].

In this study, it was aimed to examine the nutritional status of patients hospitalized in different wards at Recep Tayyip Erdoğan University Faculty of Medicine Hospital, to determine the frequency of malnutrition and to evaluate the awareness of physicians on this issue.

Materials and Methods

The approval of the local ethics committee (Recep Tayyip Erdoğan University Faculty of Medicine, Non-Interventional Clinical Research Ethics Committee) was obtained for this study on 03.07.2019 (Number: 40465587-050.01.04-186 Decision no: 2019/107). Informed consent was obtained from all patients participating in the study.

Individuals and study design

Patients hospitalized in different wards of Recep Tayyip Erdoğan University Medical Faculty Hospital were included in the study. A total of 480 patients over 18 years of age were prospectively evaluated in the study. The inclusion criteria were determined as patients over 18 years of age, hospitalized in any of the wards of Recep Tayyip Erdoğan University Faculty of Medicine Hospital, who were predicted to be hospitalized for at least one week. Patients under 18 years of age, patients hospitalized in the Internal Medicine Service followed by the researcher conducting the study, and patients predicted to be hospitalized for less than one week were excluded from the study. Patients were evaluated twice, once on the day of hospitalization and once one week after hospitalization. According to age groups, patients were divided into patients over 65 years of age and patients under 65 years of age. Patients were also divided into two groups according to gender. Demographic characteristics and chronic diseases of the patients were recorded. NRS-2002 form was used for the evaluation of nutritional status. Height, weight, body mass index (BMI), and upper arm circumference were measured. Laboratory data of the patients were evaluated.

Statistical analysis

The data were analyzed using IBM SPSS 25.5 software (IBM, Armonk, New York, USA).

Descriptive statistical methods (mean, standard deviation) were used in the evaluation of the data, and a chi-square test was used in the comparison of qualitative data. The results were analyzed at a significance level of $p < 0.05$.

Results

Of the 480 patients included in the study, 202 were female (42%), and 278 (58%) were male. The mean age of all patients was 64.3 years. 12.6%, 57.2%, 28.4%, 3%, and 1.4% of patients over 65 years of age had 1, 2, 3 and 4 chronic diseases, respectively. In patients under 65 years of age, 25.1%, 28.7%, 28.7%, 28.4%, and 14.4% had 1, 2 and 3 chronic diseases, respectively. When the patients included in the study were grouped according to

age, 285 patients were over 65 years of age, and 195 patients were under 65 years of age. When BMI and other anthropometric measurements of the patients were evaluated, upper arm circumference was found to be statistically significantly lower in individuals over 65 years of age than in individuals under 65 years of age (Table 1). There was no significant difference in other measurements.

No statistical difference was observed in the comparison of the presence of malnutrition in the evaluation of the participants according to gender ($p > 0.05$) (Table 2).

According to the first NRS 2002 measurements, 78.1% of all patients were free of malnutrition, whereas 21.9% of the patients had malnutrition. Of the 105 patients with malnutrition, 100 (35.1%) were over 65 years of age. In the first NRS 2002 assessment, malnutrition was statistically more common in patients over 65 years of age than in patients under 65 years of age ($p \leq 0.05$). According to the second NRS 2002 measurements of the patients, 45.6% of the patients over 65 years of age were not measured. Malnutrition was not detected in 23.2% of the other patients, while malnutrition was found in 31.2%. When patients under 65 years of age were evaluated, 51.8% were not measured. In other patients under 65 years of age, malnutrition was not detected in 45.1%, and malnutrition was detected in

3.1%. When the patients were compared according to the presence of malnutrition based on the second NRS 2002 measurements, a statistically significant difference was found between patients above and below 65 years of age ($p \leq 0.05$). When the patients were evaluated according to the number of days of hospitalization, no statistical difference was found between patients above and below 65 years of age ($p > 0.05$).

When the first measurement of NRS 2002 was evaluated according to the presence of chronic disease, malnutrition was observed in 3.2% of patients without chronic disease, 14.1% of patients with one chronic disease, 22.8% of patients with two chronic diseases, 22.9% of patients with three chronic diseases and 75% of patients with four chronic diseases ($p \leq 0.05$) (Table 4).

In the second evaluation of NRS 2002, malnutrition was found in 4.8% of patients without chronic disease, 15.3% of patients with one chronic disease, 23.7% of patients with two chronic diseases, 22% of patients with three chronic diseases, and 75% of patients with four chronic diseases ($p \leq 0.05$) (Table 5).

When the patients were evaluated in terms of chronic disease, it was observed that the rate of

Malnutrition increased as the number of chronic diseases increased, and there was a statistical relationship between NRS 2002 first and second measurements of chronic disease and malnutrition.

Table 1. Height, weight, and anthropometric measurements of the patients according to age.

	Over 65 years old		Under 65 years old		Total		p
	n	mean $\pm$ SD	n	mean $\pm$ SD	n	mean $\pm$ SD	
Height	285	168.02 $\pm$ 7.73	195	171.45 $\pm$ 7.36	480	169.41 $\pm$ 7.76	0.000
Initial weight	285	76.28 $\pm$ 10.95	195	78.73 $\pm$ 11.1	480	77.28 $\pm$ 11.0	0.017
Final weight	153	76.61 $\pm$ 8.62	92	77.23 $\pm$ 10.2	245	76.84 $\pm$ 9.25	0.608
Initial BMI	285	26.97 $\pm$ 3.8	195	26.74 $\pm$ 3.63	480	26.88 $\pm$ 3.73	0.500
Last BMI	156	26.88 $\pm$ 3.19	93	26.23 $\pm$ 3.14	249	26.64 $\pm$ 3.18	0.125
Upper arm circumference	285	29.75 $\pm$ 2.47	195	30.42 $\pm$ 2.37	480	30.02 $\pm$ 2.45	0.003
Number of days in hospital	285	8.83 $\pm$ 4.09	195	8.33 $\pm$ 4.27	480	8.62 $\pm$ 4.17	0.199

n: number of patients, mean: average, std: standard deviation, VKI: body mass index

Table 2. Presence of malnutrition at the first and second assessment in patients according to gender.

	Malnutrition	Gender		p
		Female n (%)	Male n (%)	
NRS 2002 First measurement	Yes	50 (24.8)	65 (19.8)	0.194
	None	152 (75.2)	223 (80.2)	
	Total	202 (100)	278 (100)	
NRS 2002 Second measurement	Yes	49 (24.3)	46 (16.5)	0.104
	None	63 (31.2)	91 (32.7)	
	Unmeasured	90 (44.6)	141 (50.7)	
	Total	202 (100)	278 (100)	

n: Number of patients, NRS: Nutritional Risk Scoring

Table 3. Presence of malnutrition in patients according to age.

	Malnutrition	Age		Total	p
		Over 65 years old	Under 65 years old		
NRS 2002 First measurement	Yes	100 (35.1)	5 (2.6)	105 (21.9)	0.000
	None	185 (64.9)	190 (97.4)	375 (78.1)	
	Total	285 (100)	195 (100)	480 (100)	
NRS 2002 Second measurement	Yes	89 (31.2)	6 (3.1)	95 (19.8)	0.000
	None	66 (23.2)	88 (45.1)	154 (32.1)	
	Unmeasured	130 (45.6)	101 (51.8)	231 (48.1)	
	Total	285 (100)	195 (100)	480 (100)	

NRS: Nutritional Risk Scoring

Table 4. NRS 2002 first measurement malnutrition rate according to the presence of chronic disease.

		NRS 2002 First Measurement		Total	p
		Yes n (%)	No n (%)		
Presence of chronic disease	None	2 (3.2)	61 (96.8)	63 (100)	0.000
	1 Chronic disease	12 (14.1)	73 (85.9)	85 (100)	
	2 Chronic disease	63 (28.8)	156 (71.2)	219 (100)	
	3 Chronic disease	25 (22.9)	84 (77.1)	109 (100)	
	4 Chronic disease	3 (75)	1 (25)	4 (100)	
	Total	105 (21.9)	375 (78.1)	480 (100)	

n: number of patients, NRS: Nutritional Risk Scoring

Table 5. NRS 2002 second measurement malnutrition rate according to the presence of chronic disease.

		NRS 2002 second measurement			p
		Yes n (%)	No n (%)	Unmeasured n (%)	
Presence of chronic disease	None	3 (4.8)	25 (39.7)	35 (55.6)	0.000
	1 Chronic disease	13 (15.3)	36 (42.4)	36 (42.4)	
	2 Chronic disease	52 (23.7)	69 (31.5)	98 (44.7)	
	3 Chronic disease	24 (22)	24 (22)	61 (56)	
	4 Chronic disease	3 (75)	0	1 (25)	
	Total	95 (19.8)	154 (32.1)	231 (48.1)	

n: number of patients, NRS: Nutritional Risk Scoring

Discussion

Malnutrition is considered a major syndrome with multifactorial etiology and serious consequences for health outcomes and quality of life [12, 13].

In a study involving a total of 29,139 patients hospitalized in 62 hospitals in Turkey using the NRS-2002 test, patients at risk of malnutrition were identified, and malnutrition risk was found in approximately 15% of the patients included in the study [14]. Another study including seven hospitals in Switzerland reported that 18.2% of 32837 patients hospitalized in internal medicine wards were at risk of malnutrition [12]. In another study, no significant difference was found as a result of the evaluation of malnutrition status in 286 hospitalized patients in terms of gender [7]. In another study conducted in Brazil in which 300 hospitalized patients were included, it was reported that the rate of

malnutrition was higher in males than in females [7]. In a study conducted in Spain on 1718 patients, the rate of malnutrition was found to be 25.7% in women and 20.7% in men [2]. In our study, no statistical difference was found in the comparison of the presence of malnutrition according to gender. This result is similar to some studies in the literature. In some of the studies in the literature, there is a difference between genders regarding the presence of malnutrition, while in others, there is not.

In one study, it was reported that BMI in the Czech population increased with age but decreased again after 65 years of age. Participants over 75 years of age had a mean BMI of 26 kg/m², which was categorized as overweight. An important finding is that although deaths from cardiovascular diseases have been steadily decreasing for those under 65 years of age, they have increased for those aged 65 years and over in the last few years [13]. Surprisingly, despite the prevalence of

overweight and obesity in the participants (60.7%), most were still reported to be at risk of malnutrition (36.3%).

As seen from the literature, the risk of malnutrition increases, especially with increasing age. In our study, results similar to those obtained in the literature were obtained. According to the first NRS 2002 measurements, 78.1% of all patients did not have malnutrition, while 21.9% of the patients had malnutrition. According to the first NRS 2002 measurements, 100 (35.1%) of 105 patients with malnutrition were over 65 years of age. When the patients were compared according to the presence of malnutrition based on the first NRS 2002 measurements, no statistical difference was found between patients above and below 65 years of age. In addition, according to the second NRS 2002 measurements, malnutrition was found in 31.2% of patients over 65 years of age. When patients under 65 years of age were evaluated, only 3.1% had malnutrition. When the patients were compared according to the second NRS 2002 measurements, there was a statistically significant higher rate of malnutrition in patients older than 65 years compared to patients younger than 65 years. 12.6%, 57.2%, 28.4%, 3%, and 1.4% of patients over 65 years of age had 1, 2, 3 and 4 chronic diseases, respectively. 25.1%, 28.7%, and 14.4% of patients under 65 years of age had 1, 2 and 3 chronic diseases, respectively. There was a statistically significant correlation between the presence of NRS 2002 first and second measurement of chronic diseases and advanced age and malnutrition. The malnutrition rate found according to the NRS 2002 second measurement values was higher than the NRS 2002 first measurement.

Conclusion

In conclusion, when the malnutrition rates after the first and second assessments were evaluated, it was observed that patients with malnutrition during hospitalization were not provided with adequate nutritional support, and the rate of physicians' recognition and treatment of malnutrition was insufficient.

Disclosures

Ethics Committee Approval: Ethics committee approval was received for this study from Recep Tayyip Erdogan University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee, in accordance with the World Medical Association Declaration of Helsinki, with the approval number: 2019-107.

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processing - H.B.P.; Analysis and/or interpretation - H.B.P.; Literature search - S.B., H.B.P.; Writing - S.B.; Critical review - H.B.P.

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