DOI: 10.4274/jarem.galenos.2018.2588
J Acad Res Med 2020; 10(1): 27-31

Evaluation of Nutritional Status in Children Consulted to Polyclinics

Filiz Gül, Nur Şeyma Zengin, Seda Geylani Güleç

University of Health Sciences Turkey, Gaziosmanpaşa Training and Research Hospital, Clinic of Child Health and Diseases, İstanbul, Turkey

Cite this article as: Gül F, Zengin NŞ, Geylani Güleç S. Evaluation of Nutritional Status in Children Consulted to Polyclinics. JAREM 2020;10(1): 27-31

ABSTRACT

Objective: We aimed to determine the nutritional status of children who applied to polyclinic for any reason.

Methods: Anthropometric measurements of 1022 subjects aged between one month and eighteen years were evaluated prospectively between February 2017 and May 2017. According to the Gomez and Waterlow classifications, these measurements were calculated and malnutrition degrees were determined in this respect. Patients were evaluated according to relative weight and body mass index (BMI) in obesity measurement. Some patient groups were not included in the study consciously. These were patients with a birth weight of less than 2.500 g and a history of premature birth, and patients with chronic diseases were not included in the study.

Results: The mean age of the patients was 5.7±3.9 years, 501 (49%) were female and 521 (51%) were male. Malnutrition was found in 22.3% (n=228) of the cases. According to the Gomez classification, 172 (16.8%) of them were mild, 53 (5.2%) were moderate, 3 (0.3%) were severe malnutrition. According to the Waterlow classification, 2.7% (n=28) of the cases were diagnosed as acute, 4.2% (n=44) as chronic and 1.8% (n=18) as acute-chronic malnutrition. In the first 6 months, there was no patient with malnutrition before the start of additional food. According to the relative weight, 171 (16.8%) of the cases were above 110%; 1.1% of them (n=12) were under 2 years of age. Of the cases younger than 2 years of age, 0.78% (n=8) were overweight and 0.39% (n=4) were obese. Of the 159 (15.6%) patients with a relative weight above 110%, the rate of BMI was 4.8% (n=50) over 85th percentile, ie overweight, 7.7% (n=78), 95th percentile. ie, obese and 3% (n=31) were within normal limits.

Conclusion: According to our study, anthropometric measurements of the patients should be made and their nutrition should be questioned because of the high probability of detecting nutritional disorder. To any patient who came to pediatrics clinic, the importance of breastfeeding should be emphasized, and nutritional disorder rates will decrease with the introduction of additional food at the right time. Moreover, with the explanation of right food and the general nutrition rules, it is believed that the rates of nutritional disorders will decrease.

Keywords: Malnutrition, obesity, child

INTRODUCTION

Malnutrition is a change in normal body composition due to nutritional deficiency, and it can be prevented or treated (1). Protein energy malnutrition (PEM) is an important problem in undeveloped and developing countries. It is responsible for 60% of the deaths under the age of five years (2).

The presence of malnutrition in children increases the risk of death in gastroenteritis and respiratory tract by approximately twice. Symptoms varies according to duration and severity of nutritional deficiency, nutritional quality, and personal factors such as age and the presence of infection. While heavy malnutrition is easily diagnosed, it may be difficult to identify patients with mild or moderate malnutrition. Therefore, the diet of patients should be questioned well, calorie deficit should be determined, anthropometric measurements and biochemical parameters should be reviewed (3).

While PEM is observed after various diseases, trauma or surgical interventions in developed countries (4,5), malnutrition is generally detected due to malnutrition or dietary errors or as a result of common infections, especially gastroenteritis in developing

ORCID IDs of the authors: F.G. 0000-0001-5158-6660; N.Ş.Z. 0000-0001-5158-6660; S.G.G. 0000-0001-5158-6660.

Corresponding Author: Filiz Gül,
E-mail: dr.filizgul@gmail.com

Received Date: 30.10.2018 **Accepted Date:** 26.12.2018

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countries (6). Patients suspected to have PEM are evaluated according to the Gomez and Waterlow classifications (7-11).

Obesity in childhood is a health problem that needs to be approached carefully because it continues as adult obesity in the future, it causes insulin resistance, lipid metabolism disorder, high blood pressure and severe psychological stress, causes high morbidity and mortality rates, and most importantly it can be prevented (12,13).

In studies conducted in different times and provinces in our country, it is stated that the frequency of malnutrition decreases and obesity increases in children, but today, malnutrition and obesity are important health problems that can be prevented for both healthy children and hospitalized children (14). For this reason, in our study, we aimed to evaluate the nutritional status in patients who applied to the pediatric outpatient clinic of our hospital for any reason.

METHODS

Between the years of February 2017 and May 2017, 1022 patients between the ages of 1 month and 18 years, who were admitted to our hospital's general child outpatient clinic, were included in our study. Patients with a birth weight below 2.500 grams and a preterm birth history, patients with chronic disease, patients with post-surgical short bowel syndrome and malabsorption were not included in the study because they had the risk factors for the development of malnutrition. Ethics committee approval was received for this study from the Ethic Committee of Taksim Training and Research Hospital (approval number: 11, date: 22.02.2017). Consent was obtained from the parents of the patients. Anthropometric measurements of the cases were evaluated prospectively. Measurements are made by the same healthcare professional with the same weight and height measuring device. Weight and height measurements were evaluated according to the references. Weight by age, height by age and weight by height were determined. According to the Gomez classification, the ratio of current weighing to weighing that should be according to age was calculated. According to age, those with the weights of 90-110% were evaluated as normal, those with the weights of 75-89% as mild, those with the weights of 60-74% as moderate, and those below 60% as severe malnutrition. According to the Waterlow classification, those with a weight less than 90% by height and with a height greater than 95% by age were defined to have acute malnutrition. Those with a weight greater than 90% by height and with a height less than 95% by age were defined to have chronic malnutrition. And, those with a weight less than 90% by height and with a height less than 95% by age were defined as acute malnutrition in the chronic base.

In the evaluation of obesity, the patients were separately evaluated according to relative weight (weight by height) and body mass index (BMI). Children under 2 years of age were classified using relative weight. Considering weight by height, those with 110-120% were evaluated as overweight, and those over 120% were considered as obese. In children older than two years of age, those with BMI of 85. percentile and above were evaluated as overweight and those with BMI of 95. percentile and above were evaluated as obese.

Statistical Analysis

The statistical analysis of the data was done with the 11.0 version of the SPSS program.

RESULTS

The average age of the patients in our study was 5.7±3.9 years, 501 (49%) were girls and 521 (51%) were boys. Malnutrition was observed in 22.3% (n=228) of the cases. The distribution of our patients who are included in the study according to their age (month) and gender is as in Table 1. According to the Gomez classification, 171 (18%) of malnutrition patients were mild, 54 (5.2%) were moderate and 3 (0.3%) had severe malnutrition (Table 2). One of our patients with severe malnutrition was 14 years old and girl; others were boys aged 2 and 15 years. According to the Waterlow classification, 2.7% (n=28) of the cases were defined as acute, 4.3% (n=44) as chronic, 1.7% (n=18) as acute malnutrition in the chronic base (Table 3). We did not have any patients with malnutrition in the first 6 months, before the initiation of supplementary food.

According to the relative weight, 171 (16.8%) of the patients were above 110%; 1.1% (n=12) of them were under 2 years old. The relative weight of 12 of the cases under the age of two years (n=237) was above 110%, 8 of them (3.3%) were over 85. percentile, in other words overweight, according to BMI, and 4 (1,7%) were over 95. percentile, in other words obese. 4.8% (n=50) of 159 patients (15.6%) with a relative weight above 110% and age above two years were above the 85. percentile, that is, overweight; 7.7% (n=78) were above the 95. percentile, that is, obese; and 3% (n=31) were within normal limits Table 4. While 60% (n=30) of overweight patients were male, 46.1% (n=36) of obese patients were male.

DISCUSSION

Malnutrition is kept responsible for more than half of child deaths in the world. Nearly 13 million children under the age of 5 years die each year due to malnutrition (15-17). Malnutrition is still an important problem, especially for developing countries like us. In addition, early detection and early treatment of malnutrition is of great importance. While it is easier to detect the presence of heavy malnutrition, it may be difficult to find the presence of moderate and mild malnutrition. Early diagnosis reduces mortality and morbidity, as well as decreases the cost by decreasing hospitalization rate. In Turkey, the presence of many factors such as low socio-economic status and level of education, wrong eating habits and lack of proper hygiene conditions leads to the occurrence of malnutrition. Improper environmental conditions and accompanying infections make malnutrition more evident (3). Our hospital provides health services to a socioeconomically low and medium population. In patients who apply to general child polyclinic, it is believed that malnutrition rates will decrease

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by emphasizing the importance of breastfeeding, starting supplementary food with the right food at the right time and explaining the general hygiene rules.

In our study, we detected 22.3% malnutrition in patients who applied to our hospital for other reasons. In addition to the Gomez classification, we also used the Waterlow classification as it includes height measurement and can also display chronic malnutrition in detecting and classifying malnutrition. According to Gomez, 18% of our cases had mild, 5.2% had moderate and 0.3% had severe malnutrition. According to Waterlow; 2.7% were evaluated as acute, 4.3% as chronic, 1.7% as acute malnutrition in the chronic base. In our country, according to the values determined by the Turkey Nutrition and Health Survey (TNHS) conducted in 2010, 10.3% of children under 5 years of age were lower weight and 5.6% were found to be have severe malnutrition (18).

When the values we found in our study were compared with the TNHS data, it was seen that the malnutrition rate was higher. Our study values' being higher than TNHS values can be resulted from the fact that the children in our sample were from the population with low socio-economic status.

In our study, we did not have any patients who were found to have malnutrition in the first 6 months, before starting additional food. The supplementary food onset is a critical period for childhood. Low birth weight, delay of baby's time to meet with breast milk, cesarean delivery, high income level, multiparity and use of pacifier are the factors that increase the tendency to start supplementary foods in the first 6 months. The early introduction of additional food causes decreased breast milk, thereby reducing the absorption of certain nutrients, especially iron. In newborns and infants whose digestive system is not fully developed, early switching to additional food increases the likelihood of allergies, especially to cow's milk.

Starting additional food late, as well as starting early, has a negative impact on the child's growth and development. Accordingly, problems such as slowing of growth and development,

Table 1. Distribution of cases by age and gender

	≤6 months		6-24 months		25 months-6 years		6 months-12 years		12 years-18 years	
	n	%	n	%	n	%	n	%	n	%
Girl	23	2.2	99	9.6	180	17.6	154	15	45	4.4
Boy	18	1.7	97	9.4	207	20.2	173	16.9	26	2.54
Total	41	4	196	19.1	387	37.8	327	32	71	7

Table 2. Distribution of malnutrition levels according to ages and Gomez classification of cases

Gomez	≤6 months		6-24 months		25 months-6 years		6 months-12 years		12 years-18 years		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Normal	38	3.7	140	13.6	316	30	247	24.1	53	5.1	794	76.5
Mild	1	0.1	47	4.7	64	7.6	50	4.8	9	0.8	171	18
Moderate	1	0.1	10	1	6	0.5	30	2.9	7	0.7	54	5.2
Severe	0	0	0	0	1	0.1	0	0	2	0.2	3	0.3
Total	40	3.9	197	19.3	387	38.2	327	31.8	71	6.8	1022	100

Table 3. Distribution of malnutrition types by age and Waterlow classification of cases

Waterlow	≤6 months		6-24 months		25 months- 6 years		6 years-12 years		12 years-18 years		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Normal	39	3.8	182	17.9	361	35.3	288	28.1	62	6	932	91.3
Acute	1	0.09	6	0.6	7	0.7	13	1.3	1	0.09	28	2.7
Chronic	1	0.09	4	0.4	14	1.4	18	1.7	7	0.7	44	4.3
Acute in the chronic base	0	0	3	0.3	5	0.5	8	0.8	2	0.2	18	1.7
Total	41	4	195	19.2	387	37.9	327	31.9	72	7	1022	100

Table 4. Distribution of cases according to relative weight

Relative weight >%110	Normal		Overweight		Obese		Total	
	n	%	n	%	n	%	n	%
<2 years	0	0	8	4.6	4	2.3	12	7
>2 years	31	18.1	50	29.2	78	45.6	159	93
Total	31	18.1	58	33.8	82	47.9	171	100

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malnutrition, various vitamin mineral deficiencies, immune deficiency, infectious diseases and micronutrient deficiencies may occur.

The frequency of malnutrition in non-sick children may differ among countries, even among cities in the same country. While the presence of malnutrition in healthy children in Turkey was reported between 15 and 25% in some studies (19-21), it was found between 2.2% and 14.9% considering cross-sectional studies on children below the age of 5 years in various cities in the study of Tezcan et al. (22) between 1989 and 1996.

In other countries, malnutrition rate was 31% mild, 9% moderate, and 1.6% severe in Jamaica (23), 7.4% acute and 60.7% chronic (24) in Nigeria, 16.5% acute and 38.2% chronic in North Korea (25). In a study conducted to investigate nutritional problems in a private school in Ankara, 15.1% malnutrition was found (26). The rate found shows that the frequency of malnutrition (20,21) determined between 1983 and 1993 is at similar levels in 2007. The frequency of malnutrition varies and increases with the different quality of life of the countries, poor diet habits and low education levels, variable population growth, poor nutritional distribution, and inadequate food quality and quantity. In addition, accompanying infections aggravate malnutrition.

Children's dietary habits are closely related to the country's nutritional culture. Obviously, obesity is found at increasing levels in pediatric patients in developed and developing countries. Various factors such as having familial predisposition, skipping meals, especially breakfast, having snacks between meals and lack of physical activity are seen to be effective in the development of obesity (27,28).

There are also differences in terms of frequency of obesity in children according to countries. However, it is seen that it is common to all countries that the rate of obesity increases in parallel with the increase in the level of development and the habits of consuming ready-to-eat food. Studies showing the increase in obesity rates in children are still insufficient (29). In our study, 16.8% (n=171) of the patients were above 110% according to the relative weight, 8% (n=82) were above the 95. percentile, that is, obese. While 60% (n=30) of overweight patients were male, 46.1% (n=36) of obese patients were male. In a study, among 4.260 children between the ages of 6-15 years in Muğla province, it was observed that the rate of overweight or obese ones was 7.6% in girls and 9.1% in boys (28).

In a study conducted in a private school with a high socio-economic level in İstanbul in 2003, the frequency of obesity was 8.4% and the frequency of overweight was 26.7% in 299 children aged between 6 and 15 years (30).

In a study performed in Ankara, in which 180 children between the ages of 1 and 11 years were included, it was found that 44.4% of males and 31% of females from 56 cases over 5 years of age were above normal weight values (31).

CONCLUSION

According to the results of our study, there is a high probability of detecting nutritional disorders among patients who apply to the outpatient clinic with any complaints. Malnutrition is a serious health problem for our country. Obesity is also increasingly seen in children. For this reason, anthropometric measurements of patients admitted to our polyclinic must be made and their nutrition must be questioned. We believe that the nutritional disorder rates will decrease by emphasizing the importance of breastfeeding, starting supplementary food with the right food at the right time and explaining the general nutrition rules to the families.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethic Committee of Taksim Training and Research Hospital (approval number: 11, date: 22.02.2017).

Informed Consent: Consent was obtained from the parents of the patients.

Peer-review: Externally and internally peer-reviewed.

Author Contributions: Concept - F.G., S.G.G.; Design - F.G.; Supervision - F.G.; Resource - F.G., N.Ş.Z., S.G.G.; Materials - F.G., N.Ş.Z.; Data Collection and/or Processing - F.G., N.Ş.Z.; Analysis and/ or Interpretation - F.G.; Literature Search - F.G.; Writing Manuscript - F.G.; Critical Reviews - F.G., S.G.G.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

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