RESEARCH / ARAŞTIRMA
DOI: 10.26650/IUITFD.1309384
İst Tıp Fak Derg 2024 / J Ist Faculty Med 2024

THE EVALUATION OF MALNUTRITION WITH PREOPERATIVE Z SCORE ANALYSES IN PATIENTS WITH VEAU TYPE 1 AND TYPE 2 CLEFT PALATE

VEAU TİP 1 VE TİP 2 DAMAK YARIĞI OLGULARINDA AMELİYAT ÖNCESİ Z SKORU ANALİZİ İLE MALNUTRİSYONUN DEĞERLENDİRİLMESİ

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Cite this article as: Korkut M, Kozanoğlu E, Kozanoğlu T, Akalın BE, Gündeş E, Emekli U, et al. The evaluation of malnutrition with preoperative z score analyses in patients with veau type 1 and type 2 cleft palate. J Ist Faculty Med 2024;87(1):76-80. doi: 10.26650/IUITFD.1309384

ABSTRACT

Objective: Cleft lip and palate are the most common congenital anomalies of the head and neck region. According to studies, 13.5% of children under 5 years of age were reported to be underweight. When compared with the global data, this ratio was found to be higher in patients with isolated cleft lip, isolated cleft palate, and cleft lip with cleft palate. This study aimed to evaluate the frequency of malnutrition in isolated Veau type 1 and type 2 cleft palate in an institutional patient group.

Material and Methods: Patients with isolated Veau type 1 and type 2 cleft palate who were operated between November 2019 and February 2022 were included in the study. The age (month), height (centimeters), and weight (kilograms) of the patients were noted one day before the surgery, and Z scores were calculated for malnutrition assessment.

Result: A total of 40 patients were included in this study. The mean age of the patients was 16.82±2.73 months (7-48 months). Fourteen patients were male whereas 26 patients were female. Malnutrition was not observed in nine patients. Eight patients had chronic mild malnutrition, 5 patients had chronic moderate malnutrition and 13 patients had chronic severe malnutrition. In addition, chronic mild obesity was observed in two patients,

ÖZET

Amaç: Dudak ve damak yarıkları baş boyun bölgesinin en sık görülen konjenital anomalisidir. Çalışmalara göre 5 yaş altı çocukların %13,5'u normalden zayıf olarak bildirilmiştir. Bu veri ile global veriler kıyaslandığında izole dudak, izole damak ve hem dudak hem damak yarığı nedeniyle ilk kez ameliyat edilecek hastalarda bu oran daha yüksek bulunmuştur. Bu çalışmanın amacı izole Veau tip 1 ve tip 2 damak yarıklarında malnütrisyon görülme sıklığının kurumumuzun hasta grubunda değerlendirilmesidir.

Gereç ve Yöntem: Çalışmaya Kasım 2019 ve Şubat 2022 tarihleri arasında Anabilim Dalımıza başvuran izole Veau tip 1 ve tip 2 damak yarığı olan hastalar dahil edilmiştir. Hastaların ameliyattan bir gün önceki yaşı (ay), boyu (santimetre), ağırlığı (kilogram) değerleri not edilmiş olup malnütrisyon değerlendirmesi için Z skorları hesaplanmıştır.

Bulgular: Çalışmaya toplamda 40 hasta dahil edildi. Hastaların ortalama yaşı 16.82±2.73 (7-48 ay) idi. Hastaların 14'ü erkek ve 26'sı kızdı. Dokuz hastada malnütrisyon izlenmedi. Sekiz hastada kronik hafif malnütrisyon, beş hastada kronik orta malnütrisyon, on üç hastada kronik ağır malnütrisyon izlendi. Ayrıca iki hastada kronik hafif şişmanlık, iki hastada kronik orta şişmanlık ve bir

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Submitted/Başvuru: 05.06.2023 • **Revision Requested/Revizyon Talebi:** 11.07.2023 •
Last Revision Received/Son Revizyon: 26.11.2023 • **Accepted/Kabul:** 30.11.2023 • **Published Online/Online Yayın:** 23.01.2024

chronic moderate obesity was observed in two patients, and chronic severe obesity was observed in one patient. In total, malnutrition was observed in 65% of the patients.

Conclusion: One of the most important problems in patients with cleft palate is feeding. Inadequate nutrition predisposes to malnutrition in the preoperative period. To prevent this situation, the patients should be referred for prompt professional nutritionist care and early follow-up.

Keywords: Cleft lip, growth restriction, malnutrition, secondary cleft palate, Z score

hastada kronik ağır şişmanlık izlendi. Toplamda %65 hastada malnütrisyon izlendi.

Sonuç: Damak yarığı olan hastalarda karşımıza çıkan en önemli sorunlardan biri beslenmedir. Yeterli beslenmenin yapılamaması cerrahi öncesi dönemde malnütrisyona zemin hazırlamaktadır. Bu durumun önüne geçilmesi için hastalar hemen profesyonel beslenme uzmanı desteğine ve erken takibe yönlendirilmelidir.

Anahtar Kelimeler: Büyüme geriliği, dudak yarığı, malnutrisyon, sekonder damak yarığı, Z skoru

INTRODUCTION

Cleft lip and palate are the most common congenital anomalies of the head and neck region. They may be associated with syndromes; however, isolated cleft lip and palate are seen more frequently. Although the incidence varies depending on race, cleft lip and palate are seen approximately one in every thousand births (1). While multifactorial causes are observed in the etiology, genetic and physical factors play a significant role. Although different systems are used in the classification of cleft palate, the Veau classification is the most preferred one (Table 1).

Table 1: Veau Classification

Type 1	Incomplete, cleft of soft palate
Type 2	Incomplete, cleft of soft and hard palate
Type 3	Complete unilateral cleft of primary and secondary palate
Type 4	Complete bilateral cleft of primary and secondary palate

Children with cleft lip and palate should be followed up with a multidisciplinary approach beginning from birth. Patients with cleft lip and palate should be followed up by plastic reconstructive and aesthetic surgeons, otorhinolaryngologists, pediatricians, dentists, orthodontists, and speech therapists. Their anomalies predispose these children to difficulties in feeding. Due to the patients' inability to create sufficient oral competency, inability to create negative pressure during breastfeeding, and predisposition to upper respiratory tract infections; malnutrition and related growth retardation may be observed.

According to studies, 13.5% of children under five years of age were reported to be underweight (2). When compared with global data, this rate was found to be higher in patients with isolated cleft lip, isolated cleft palate, and cleft lip and cleft palate (3,4). Also, there is a higher incidence of postoperative complications in children with malnutrition. Studies have shown that fistula formation which is a complication of the cleft palate operation is more common in malnourished children (5).

Cleft palate anomaly is frequently seen both in our country and in the world and patients with cleft palate are followed up preoperatively and postoperatively. This study aimed to evaluate the frequency of malnutrition in isolated Veau type 1 and type 2 cleft palate in an institutional patient group.

MATERIALS and METHODS

Patients with isolated Veau type 1 and type 2 cleft palate who were operated between November 2019 and February 2022 were included in the study. Patients with an associated syndrome and patients with cleft lip were not included in the study. Age (month), height (centimeters), and weight (kilograms) of the patients were noted one day before the surgery, and Z scores were calculated for malnutrition assessment. The child growth standards of the World Health Organization (WHO) were taken into consideration in the calculation of the Z scores (6).

The study protocol was approved by the Istanbul Faculty of Medicine Clinical Research Ethics Committee (Date: 28.04.2023, No: 09). All data were anonymized, and the informed consents of the patients were recorded.

The Z Scores (height for age) of 0 to +1 and -1 were considered normal (2). The values of -1 and -2 were considered mild malnutrition and the values of -2 and -3 were considered moderate malnutrition (2,3). Severe malnutrition was accepted as value that were below -3. The values of +1 and +2, +2 and +3, and +3 and above were considered as chronic mild, chronic moderate, and chronic severe obesity respectively (2,3).

RESULTS

A total of 40 patients were included in the study. Fourteen of the patients were male and 26 patients were female. Demographic characteristics of the patients are shown in Table 2. Malnutrition was not observed in nine patients. Eight patients had chronic mild malnutrition, five patients had chronic moderate malnutrition and 13 patients had chronic severe malnutrition. In addition, chronic mild obesity was observed in two patients, chronic moderate obesity was observed in two patients, and chronic severe obesity was observed in one patient. In total, chronic

Table 2: Patients' demographic characteristics and Z-Score results

Patient number	Age (month)	Weight (kg)	Height (cm)	Weighing by age	Height by age	Weighing by height	Z-Score for chronic malnutrition (Height by age)	Z-Score for acute malnutrition (Weighing by height)
1	20	10	67	-0.6	-5.33	2.96	Severe	Normal
2	19	6.8	67	-3.74	-5.18	-1.14	Severe	Mild
3	19	10	70	-1.05	-4.93	2.02	Severe	Normal
4	22	9	73	-2.43	-4.56	-0.12	Severe	Normal
5	11	8	63	-0.83	-4.11	2.01	Severe	Normal
6	11.5	8	64	-0.94	-3.93	1.65	Severe	Normal
7	16	12	71	1.1	-3.73	3.84	Severe	Normal
8	18	9	71	-1.15	-3.49	0.79	Severe	Normal
9	26	7	79	-4.79	-3.41	-4.66	Severe	Severe
10	13	9	67	-0.26	-3.34	1.9	Severe	Normal
11	11	8.3	65	-0.53	-3.32	1.69	Severe	Normal
12	7	7	61	-0.9	-3.02	1.42	Severe	Normal
13	48	13	90	-1.63	-3.02	0.31	Severe	Normal
14	16	10	74	-0.55	-2.59	0.87	Moderate	Normal
15	22	12	79	0.1	-2.54	1.83	Moderate	Normal
16	16	10.5	75	-0.11	-2.2	1.18	Moderate	Normal
17	30	12.5	84	-0.2	-2.19	1.42	Moderate	Normal
18	13	7	72	-3.11	-2.05	-2.99	Moderate	Moderately
19	11	8	69	-0.89	-1.89	0.06	Mild	Normal
20	10	6.7	68	-2.18	-1.83	-1.64	Mild	Mild
21	19	10.8	79	-0.36	-1.7	0.61	Mild	Normal
22	9	8	69	-1.13	-1.64	-0.3	Mild	Normal
23	17	12	78	0.92	-1.41	2.03	Mild	Normal
24	18	10.5	78	0.08	-1.2	0.87	Mild	Normal
25	48	18	98	0.76	-1.17	2.18	Mild	Normal
26	17	12	77	1.35	-1.11	2.47	Mild	Normal
27	13	10.2	75	0.29	-0.81	0.84	No malnutrition	Normal
28	14	8.5	75	-0.91	-0.71	-0.83	No malnutrition	Normal
29	4	6.5	62	-0.23	-0.53	0.21	No malnutrition	Normal
30	18	10	80	-0.27	-0.42	-0.1	No malnutrition	Normal
31	8	8	69	-0.1	-0.21	0.06	No malnutrition	Normal
32	18	13	83	1.41	-0.03	1.92	No malnutrition	Normal
33	14	11	80	0.69	0.56	0.61	No malnutrition	Normal
34	14	9	74	0.69	0.56	0.61	No malnutrition	Normal
35	18	10	84	-0.27	0.94	-1.07	No malnutrition	Mild
36	10	9.5	75	0.79	1.12	0.42	Mild Obesity	Normal
37	14	11.8	82	1.33	1.36	1.02	Mild Obesity	Normal
38	15	12	84	1.68	2.14	0.98	Moderate Obesity	Normal
39	15	12.5	85	1.99	2.5	1.19	Moderate Obesity	Normal
40	11	11.5	85	1.72	4.15	0	Severe Obesity	Normal

malnutrition was observed in 65% of the patients. Also, Z score evaluation was performed by calculating weight-for-height values to determine acute energy malnutrition. Thirty-five children were found to be normal. However, three children had mild, one child had moderate, and one child had severe acute malnutrition.

DISCUSSION

Cleft palate is a common anomaly worldwide and one of the most important problems of these patients is feeding. These children have difficulty in sucking and they cannot create sufficient intraoral negative pressure. For these reasons, alternative methods have been designed for feeding patients with cleft palate. Some special feeding bottles, bowls, and syringes may facilitate feeding in these babies in the preoperative period (7,8).

The patients' parents should be informed about this anomaly both prenatally and postnatally and the patients should be referred to a multidisciplinary center. In the preoperative period, the family should be informed about specific conditions such as feeding difficulties and growth restriction. The patients should be referred to plastic, reconstructive, and aesthetic surgery for the surveillance of the maxillofacial development, orthodontics for dental development, otorhinolaryngology for hearing problems and possible otitis and upper respiratory tract infections, speech therapist for articulation, and Pediatrics for growth monitoring and follow-up.

The development of the child plays an important role in the surgical timing of the cleft palate repair. The weight, the hemoglobin level, and the age of the patient are considered for the timing of the surgery. In general, cleft palate surgery should be performed before 12 months of age; in fact, the timing is determined by the speaking ability of the children. For this reason, nutritional support is important to avoid any delays in the operation.

Z-score analysis is a WHO-recommended method that is frequently used to monitor the growth and development of children. It is recommended to calculate and evaluate the population-based Z scores by assessing anthropometric measurements such as height, weight, and BMI. These Z scores help the physicians in evaluating the development and detecting the malnutrition of the pediatric group (9).

In the preoperative period, patients with insufficient nutrition are susceptible to comorbidities such as upper respiratory tract infections and otitis (10). These recurring clinical conditions may deepen the malnutrition of the patients (10). Some studies show that preoperative malnutrition causes an increase in postoperative complications (5).

The underweight ratio was found to be higher in patients with cleft palate. According to the results of this study, chronic malnutrition was observed in 65% of the patients with isolated cleft palate. Thus, the prevalence of malnutrition was four-fold higher in the cleft palate population compared to the general population. However, 66% of the children were in the normal range for acute energy malnutrition. These children are prone to chronic rather than acute malnutrition and this finding may be attributed to the growth hormone deficiencies in cleft lip and palate patients (11). This finding underscores the significance of preoperative nutritional counseling for these patients.

The syndromic patients and cleft lip patients were excluded from this study to avoid the confounding effects of their comorbidities. Future studies may be performed with a larger cohort and with other Veau types; in fact, the Veau types may be compared according to the severity of malnutrition.

Cleft lip and cleft palate are significantly more prevalent in impoverished communities. However, a population-matched correction and a maternal nutritional status assessment were not performed in this study. They may be regarded as the limitations of this study.

CONCLUSION

To prevent chronic malnutrition during the presurgical period, the patients should be followed up in a multidisciplinary manner, and the patients should be referred to professional nutritionists.

Ethics Committee Approval: This study was approved by İstanbul Faculty of Medicine Clinical Research Ethics Committee (Date: 28.04.2023, No: 09).

Informed Consent: All data were anonymized, and the informed consents of the patients were recorded.

Peer Review: Externally peer-reviewed.

Author Contributions: Conception/Design of Study- M.K., E.K., T.K.; Data Acquisition- M.K., E.G.; Data Analysis/Interpretation- M.K., B.E.A., U.E., A.A.; Drafting Manuscript- M.K., E.K., T.K., E.G.; Critical Revision of Manuscript- B.E.A., U.E., A.A.; Final Approval and Accountability- M.K., E.K., T.K., E.G., B.E.A., U.E., A.A.

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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