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Dysphagia Management in Patients with Acute Stroke: The Results of a Prospective Close Follow-Up Design

Akut İnmeli Hastalarda Disfaji Yönetimi: Prospektif Yakın Takip Tasarımının Sonuçları

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This study was presented as a poster at the VIII. Medical Rehabilitation Congress, November 9-13, 2022, Ankara, Türkiye.

ABSTRACT Objective: This study aimed to examine the results of early rehabilitation and follow-up procedures for dysphagia in patients with acute stroke. **Material and Methods:** A total of 55 patients aged 18-85 years who were diagnosed with acute stroke between June 2020 and January 2021 and who were detected to have dysphagia by bedside swallowing test were included for prospective follow-up. Patients who were unconscious and uncooperative, had oropharyngeal structural damage, or had head/neck malignancy were excluded from the study. The Gugging Swallow Screening Test and Eating Assessment Tool-10 were used for the swallowing evaluations of the patients. Swallowing evaluation was performed before rehabilitation, at discharge, and after rehabilitation. Patients were given individual early rehabilitation consisting of diet modification, safe swallowing recommendations, oral hygiene, and exercise program, and acute stroke patients were closely followed up during their hospital stay and for 1 month after discharge. **Results:** A significant improvement was found in dysphagia scores after the rehabilitation ($p<0.05$). A significant relationship was found between dysphagia score change and oral hygiene, stroke history, and stroke type after the rehabilitation ($p<0.05$). A negative correlation was found between the dysphagia score and the National Institutes of Health Stroke Scale score before the rehabilitation, and a positive correlation was found between the body mass index, Barthel, and Functional Ambulation Classification score ($p<0.05$). **Conclusion:** In this study, close monitoring of acute stroke patients with dysphagia with individual rehabilitation improved dysphagia scores and reduced morbidities that may develop in patients.

Keywords: Dysphagia; stroke; dysphagia rehabilitation

ÖZET Amaç: Bu çalışma, akut inmeli hastalarda disfaji açısından erken rehabilitasyon ve takip işlemlerinin sonuçlarını incelemek amacıyla yapıldı. **Gereç ve Yöntemler:** Haziran 2020 ile Ocak 2021 tarihleri arasında akut inme tanısı konulan ve yatak başı yutma testi ile disfaji tespit edilen 18-85 yaş arası 55 hasta prospektif takip için çalışmaya dahil edildi. Bilinci kapalı ve koopere olmayan, orofaringeal yapısal hasarı veya baş/boyun malignitesi olan hastalar çalışmadan hariç tutuldu. Hastaların yutma değerlendirmeleri için Gugging Yutma Tarama Testi ve Yeme Değerlendirme Aracı-10 kullanıldı. Yutma değerlendirmesi rehabilitasyondan önce, taburcu olurken ve rehabilitasyondan sonra yapıldı. Hastalara yutma değerlendirmesi sonrası diyet modifikasyonu, güvenli yutma önerileri, oral hijyen ve egzersiz programından oluşan bireysel erken rehabilitasyon uygulanarak akut inmeli hastalar hastanede yatış süreleri ve taburcu olduktan sonra da 1 ay süreyle yakın takip edilmiştir. **Bulgular:** Rehabilitasyondan sonra disfaji skorlarında anlamlı iyileşme bulundu ($p<0,05$). Rehabilitasyondan sonra disfaji skoru değişimi ile ağız hijyeni, inme öyküsü ve inme tipi arasında anlamlı ilişki bulundu ($p<0,05$). Rehabilitasyon öncesi disfaji skoru ile Ulusal Sağlık Enstitüleri İnme Ölçeği skoru arasında negatif korelasyon, beden kitle indeksi, Barthel ve Fonksiyonel Ambulasyon Sınıflandırma skoru arasında ise pozitif korelasyon bulundu ($p<0,05$). **Sonuç:** Bu çalışmada disfaji saptanan akut inme hastalarının bireysel rehabilitasyon ile yakından takip edilmesinin disfaji skorlarını iyileştirdiği ve hastalarda gelişebilecek morbiditeleri azalttığı gözlemlendi.

Anahtar Kelimeler: Disfaji; inme; disfaji rehabilitasyonu

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Dysphagia occurs as a result of disturbances during the oral, pharyngeal, or esophageal phases of swallowing. Food aspiration after dysphagia is a strong risk factor for pneumonia and requires nutritional intervention. Therefore, oropharyngeal dysphagia may impair the nutritional, hydration, and pulmonary status of individuals and may lead to mortality, especially in elderly patients. The management of pulmonary complications caused by aspiration is challenging. Evaluation of the presence and severity of aspiration occurring during the pharyngeal phase of swallowing is of primary importance for prognosis and rehabilitation. Because oropharyngeal dysphagia is often present after acute stroke and may persist in many patients, swallowing function should be evaluated as early as possible in all stroke patients.[1,2]

Guidelines recommend early screening of stroke patients for dysphagia before oral intake, and there is evidence that screening practices can prevent pneumonia.[3,4] The Stroke Care Routine Handbook, published in Brazil in 2013, recommends that all stroke patients who can maintain postural control and stay alert for 15 minutes should be screened for dysphagia and that oral feeding should be allowed only after this assessment. However, comprehensive screening cannot be performed in many hospitals due to the lack of professionals specialized in this field.[5]

Early diagnosis and implementation of appropriate rehabilitation protocols can reduce the incidence of dysphagia and associated mortality. The aim of dysphagia rehabilitation is to prevent aspiration, dehydration, and malnutrition by restoring functional and physiological swallowing. There is no standard management approach for dysphagia rehabilitation in the literature.[6]

This study aimed to establish management strategies for the diagnosis and treatment of dysphagia in patients with acute stroke and to determine the factors affecting the severity and prognosis of dysphagia.

MATERIAL AND METHODS

STUDY DESIGN AND PARTICIPANTS

This clinical study was conducted as a prospective controlled study. A total of 55 patients, 26 females and 29 males, aged 18-85 years, diagnosed with acute stroke in the Neurology Clinic between June 2020 and January 2021 and in whom dysphagia was detected by a bedside swallow test were included for prospective follow-up. Patients who were unconscious and uncooperative, had oropharyngeal structural damage, or had head/neck malignancy were excluded from the study.

The patients' demographic information and histories were obtained, and a neurological was examined. Clinical parameters were evaluated using the National Institutes of Health Stroke Scale (NIHSS), Barthel Index (BI), and Functional Ambulation Classification (FAC). Swallowing assessment of the patients was performed with the Gugging Swallowing Screen (GUSS) test and the Eating Assessment Tool-10 (EAT-10) 3 times, namely, before the rehabilitation (T1), at the discharge (T2), and after the rehabilitation (T3). According to the results of the GUSS test, suitable patients with moderate and severe dysphagia were determined by videofluoroscopy (VFS) and Penetration-Aspiration Scale (PAS) before the rehabilitation program. Patients who underwent an early rehabilitation program were followed up for mortality and morbidity during hospitalization and for 1 month after discharge.

This study meets the guidelines of the Declaration of Helsinki and was approved by Yıldırım Beyazıt University Faculty of Medicine Clinical Research Ethics Committee (date: June 10, 2020, no: 41). All subjects provided written informed consent. Informed consent was obtained from the parents/legal guardians of the illiterate participants.

DYSPHAGIA ASSESSMENT

The GUSS test consists of two main parts. The first part is the preliminary or indirect swallow test. Patients who receive 5 points from this section, which is based on observation without any application, can proceed to the second section. The second step is the direct swallow test. In this section, semi-solid (1/3, 1/2, 3-5 teaspoons thickened water-pudding consistency), liquid (3, 5, 10, 20, 50 ml water), and solid (a piece of bread) consistencies are given and evaluated. A maximum of 5 points is taken from each consistency, and 20 points are reached. Scores obtained

from the test are classified as follows: 0-9 points=severe dysphagia and high risk of aspiration, 10-14 points=moderate dysphagia and moderate risk of aspiration, 15-19 points=mild dysphagia and mild aspiration, and 20 points=normal. If a score of 5 is obtained in any of the sections, stop the test and perform further evaluation (VFS or fiberoptic endoscopic evaluation of swallowing). For this test to be applied, 24 hours had passed since the stroke, and the patient must have been cooperative and be able to sit upright in bed. The advantages of this screening test over other bedside screening tests are as follows: it can evaluate all consistencies separately and regulate the patient's diet according to the degree of swallowing disorder. Turkey's validity and reliability study was performed by Umay et al. in 2018.[7]

The EAT-10 is a 10-item scale used to evaluate dysphagia symptoms, severity, and response to treatment. Each item is scored from 0 to 4. Here, zero indicates no problem, and 4 indicates severe problem. The total score ranged from 0 to 40. A score of 3 or more is considered abnormal.[8] A Turkish validity and reliability study was performed by Demir et al. in 2016.[9]

The PAS provides information about penetration and aspiration severity. The score ranges from 1 to 8 (1=no penetration and aspiration, 2-5=penetration available, 6-8=aspiration available).[10]

CLINICAL PARAMETERS

The NIHSS is a scale that examines neurological function in patients with stroke and provides insight into long-term prognosis. It is a neurological assessment scale with 11 categories that provides information on consciousness level, motor function, sensory function, and speech and language functions, where 0-6 points indicate good prognosis, 7-15 points indicate moderate prognosis, and 16-42 points indicate poor prognosis.[11]

The BI, which is used to measure the level of disability experienced by the patient during activities of daily living, consists of 10 main items. The total score is evaluated between 0 and 100, where 0-20 points: fully dependent, 21-61 points: severely dependent, 62-90 points: moderately dependent, 91-99: mildly dependent, and 100 points: fully independent.[12]

FAC was used to determine the ambulation level of patients. In this classification, the ambulation of patients is evaluated at 6 levels between 0 and 5.[13]

REHABILITATION PROTOCOL

After clinical and swallowing evaluation of patients with acute stroke and dysphagia, an individual early rehabilitation protocol consisting of diet modification, safe swallowing recommendations, oral hygiene, and exercise program determined by the authors was applied to all patients.

According to the clinical condition of the patients, a diet was recommended using the International Dysphagia Diet Standardization Initiative (IDDSI). There are 8 different levels (0-7) for food structure and liquid consistency in IDDSI. These levels are designed to be used in dysphagia patients of all ages and cultures. Simple measurement methods have been used to test nutrient composition or liquid viscosity: a fork test is used for foods, and a gravity flow test from a 10 ml syringe is used for liquids.[14]

Oral hygiene practices were explained in detail to the patients and their relatives about oral care and its importance. Due to the inadequate functional status of patients with stroke in the acute period, oral care was performed by their relatives in most patients.

The exercise program was designed twice a day in 3 sets with 15 repetitions in each set, individually for each patient, according to the clinical evaluation results of the patients. The exercise program included effortful swallowing, posture, thermal tactile stimulation from oral sensory motor development techniques, lip, jaw joint, tongue range of motion, and resistant tongue base exercises. The exercise program is depicted in Figure 1.

The treatment was explained with practice by a speech and language therapist to the patient and their relatives. Exercises were performed under the supervision of a therapist 2 days a week and as a home exercise program on other days and for 1 month after discharge.

STATISTICAL ANALYSIS

Statistical analyses were performed using the IBM SPSS 23.0 package (USA) software. Descriptive data

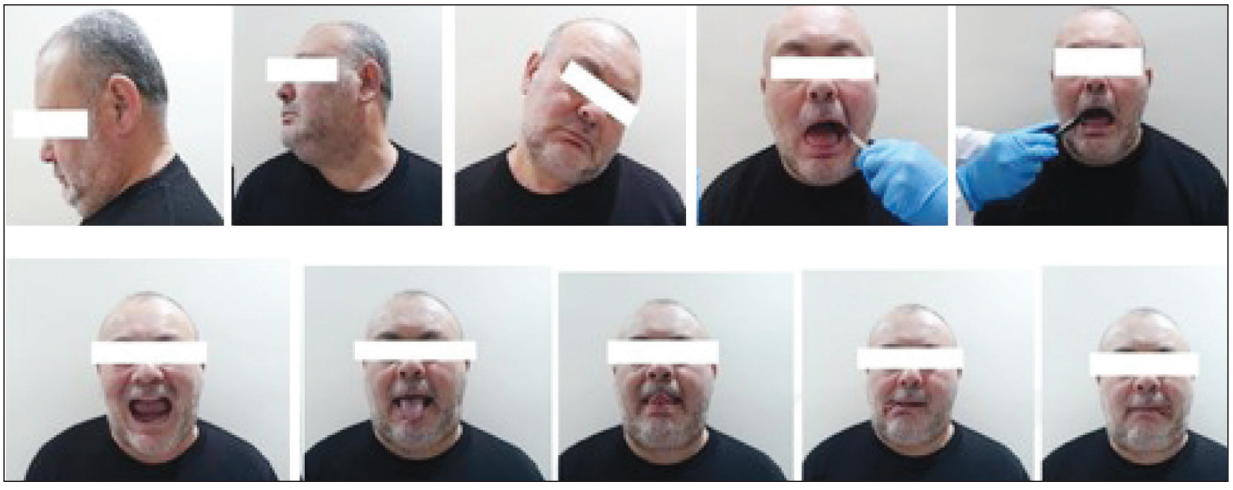

FIGURE 1: Examples from the exercise program.

were expressed as mean, standard deviation, minimum, maximum, median, frequency, and percentage. The conformity of continuous numerical variables to normal distribution was checked using the Shapiro-Wilk test. The independent samples t-test was used to compare the variables satisfying the assumption of normal distribution between paired groups, and the One-way ANOVA test was used to compare more than two groups. The Mann-Whitney U test was used to compare variables that did not fit the normal distribution between groups, and the Kruskal-Wallis test was used for comparisons between more than two groups. In numerical variables that were significantly different between more than two groups, the group that caused the difference was determined by Bonferroni correction. The Freidman test was used to compare three consecutive numerical measurements, and the Wilcoxon signed-rank test was used for pairwise comparisons. Pearson's chi-square test and Fisher's exact test were used to compare categorical variables between groups. McNemar's test was used to compare consecutive categorical measures. Spearman's or Pearson's correlation tests were used to evaluate the relationships between the measurements, according to the assumption of normal distribution. If the correlation coefficient (r) was close to 1, it was interpreted as stronger, and if it was close to 0, it was interpreted as weaker. The results were obtained at the 95% confidence interval and at the $p<0.05$ significance level.

Power analysis was performed before the study. For alpha (H0): 0.05 and power (1-ß) (H1): 0.95, the effect size was calculated as 0.5. Based on these data, the appropriate sample size was calculated as 45. Considering the possibility of dropout among the controls, 55 patients were included in the study.

RESULTS

DESCRIPTIVE CHARACTERISTICS OF PATIENTS

The sociodemographic, comorbidity, and stroke characteristics of the patients are presented in Table 1. The mean age of the patients was 65.31±13.65 years, and the mean body mass index (BMI) was 28.8±5.33 kg/m^2.

CLINICAL PARAMETER DISTRIBUTION

According to the GUSS score, 25.5% of patients in T1, 23.6% in T2, and 3.6% in T3 had severe dysphagia.

According to the GUSS result, in patients with moderate and severe dysphagia (n=36) who were clinically stable, had sitting balance, had no contrast material allergy, could initiate swallowing, and had a negative coronavirus disease-2019 PCR test (n=20), PAS values were recorded by performing VFS. The flow diagram of patients who underwent VFS is presented in Figure 2.

The GUSS T1 score did not change significantly at T2 ($p=1.0$), but increased in T3 at a statistically significant level ($p<0.001$).

TABLE 1: Distribution of patients' sociodemographic, comorbidity, and stroke characteristics.

Variables		Number (n)	Percentage (%)
Sex	Female	26	47.3
	Male	29	52.7
Activity	Mild activities	5	9.1
	Moderate activities	34	61.8
	High-intensity activities	16	29.1
Smoking status	Yes	18	32.7
	No	37	67.3
Alcohol use	Yes	3	5.5
	No	52	94.5
Comorbidity	HT	21	38.2
	HT-DM	13	23.6
	HT-DM-CVS-HL	8	14.5
	None	13	23.6
Dominant hand	Right	53	96.4
	Left	2	3.6
Stroke type	Hemorrhagic	7	12.7
	Ischemic	48	87.3
Involved side	Right	26	47.3
	Left	29	52.7
Lesion localization	TACI	14	25.5
	PACI	23	41.8
	POCI	18	32.7
Repeat stroke history	Yes	15	27.3
	No	40	72.7
Intensive care history	Yes	34	61.8
	No	21	38.2

HT: Hypertension; DM: Diabetes mellitus; CVS: Cardiovascular disease; HL: Hyperlipidemia; TACI: Total anterior circulatory infarcts; PACI: Partial anterior circulatory infarcts; POCI: Posterior circulatory infarcts.

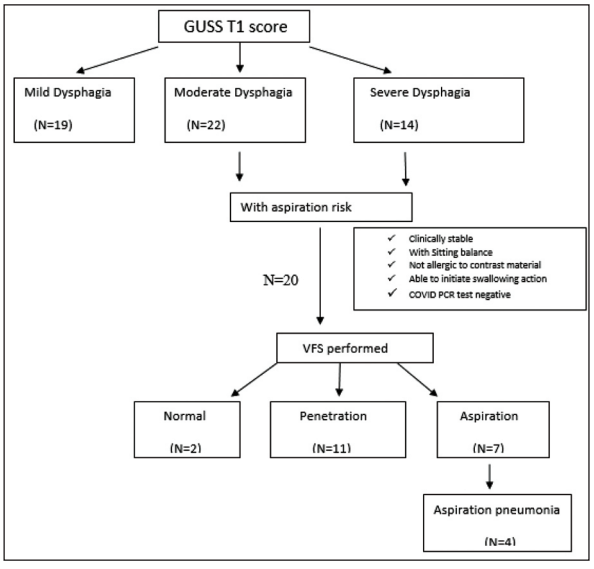

FIGURE 2: Algorithm of patients who underwent VFS according to GUSS T1 result. VFS: Videofluoroscopy: GUSS: Gugging Swallowing Screen.

The EAT-10 T1 score did not change significantly at T2 (p=1.0), but decreased significantly at T3 (p<0.001).

Aspiration pneumonia (AP) was noted in only 4 (7.3%) patients during follow-up, but none of the patients died. The mean GUSS T1 score of patients who developed AP during the follow-ups was 9.25±1.89, while the mean GUSS T1 score of patients who did not develop AP was 13.96±4.4. Patients who developed AP were included in the VFS group, and aspiration was detected in these patients.

EVALUATION OF CLINICAL PARAMETERS ACCORDING TO GUSS AND EAT-10 T1 SCORES

The relationship between the reflex, oral range of motion, oxygen demand, and incontinence characteristics of patients with GUSS and EAT-10 T1 scores is presented in Table 2.

GUSS T1 and BMI scores were found to have a statistically significant positive correlation (p<0.05). There were no statistically significant differences between the patients' gender, smoking status, alcohol use status, and comorbidity characteristics and the GUSS and EAT-10 T1 scores (p>0.05). The correlations between GUSS and EAT-10 T1 scores with clinical parameters are presented in Table 3.

EVALUATION OF CLINICAL PARAMETERS ACCORDING TO GUSS AND EAT-10 SCORE CHANGES AFTER THE REHABILITATION

The relationship between the oral hygiene and stroke characteristics of the patients and the GUSS and EAT-10 scores after rehabilitation is shown in Table 4.

There were no statistically significant differences between the patients' tongue and lip range of motion, palatal and gag reflexes, speech disorder, and lesion localization, and the change in GUSS and EAT-10 scores after the rehabilitation (p>0.05).

DISCUSSION

Dysphagia is a significant cause of mortality and morbidity in stroke patients. Swallowing evaluation should be performed starting from the acute period,

TABLE 2: Distribution of GUSS and EAT-10 T1 scores according to reflex, oral range of motion, oxygen demand and incontinence characteristics of the patients.

Variables		GUSS T1 score (X̄±SD)	p value	EAT-10 T1 score (X̄±SD)	p value
Gag reflex	Yes	15.03±3.91	**<0.001***	16.41±10.14	**0.044***
	No	10.19±3.76		22.25±7.69	
Tongue movements	Full	14.24±4.13	**0.003***	16.96±9.54	**0.010***
	Limited	8.50±3.62		27.50±6.50	
Lip movements	Full	14.37±4.07	**0.001***	16.90±9.63	**0.013***
	Limited	8.43±3.31		26.43±6.58	
Palatal movements	Symmetrical	14.39±4.02	**0.006***	16.65±8.99	**0.007***
	Asymmetrical	9.67±4.53		25.56±10.85	
Aphasia	No	14.73±3.89	**0.001***	16.24±9.25	**0.013***
	Yes	10.36±4.41		23.57±9.59	
Oxygen requirement	Yes	10.7±4.92	**0.028***	16.41±10.14	**0.005***
	No	14.27±4.09		22.25±7.69	
Incontinence	Yes	11.65±4.16	**0.013***	19.5±8.09	0.528
	No	14.74±4.23		17.31±10.67	

*p<0.05; GUSS: Gugging Swallow Screen; EAT-10: Eating Assessment Tool-10; SD: Standard deviation.

TABLE 3: Correlation of clinical parameters with GUSS and EAT-10 T1 score.

Variables	GUSS before rehabilitation program r	GUSS before rehabilitation program p value	EAT-10 before rehabilitation program r	EAT-10 before rehabilitation program p value
NIHSS	-0.383	**0.004***	0.257	0.058
NIHSS facial paralysis	-0.079	0.566	-0.055	0.690
NIHSS aphasia	-0.411	**0.002****	0.313	**0.020***
NIHSS dysarthria	-0.237	0.082	0.090	0.513
BI	0.491	**<0.001***	-0.323	**0.016***
FAC	0.348	**0.009***	-0.191	0.163

*p<0.05; GUSS: Gugging Swallow Screen; EAT-10: Eating Assessment Tool-10; NIHSS: National Institutes of Health Stroke Scale; BI: Barthel Index; FAC: Functional Ambulation Classification; r: Correlation coefficient.

TABLE 4: Distribution of GUSS and EAT-10 score changes after rehabilitation protocol according to oral hygiene and stroke characteristics of patients.

Variables		GUSS score change (X̄±SD)	p value	EAT-10 score change (X̄±SD)	p value
Oral hygiene	Poor	2.42±2.87	**0.005***	8.33±7.35	0.984
	Moderate	2.22±2.66		9.00±8.11	
	Good	4.80±2.98		8.20±6.12	
Stroke type	Hemorrhagic	2.29±2.21	0.378	2.14±3.72	**0.002***
	Ischemic	3.33±3.13		9.5±7.07	
History of recurrent stroke	No	3.95±3.2	**0.002***	8.6±7.28	0.977
	Yes	1.2±1.01		8.47±7.03	

*p<0.05; GUSS: Gugging Swallow Screen; EAT-10: Eating Assessment Tool-10; SD: Standard deviation.

and patients with dysphagia should be followed up by providing a rehabilitation protocol. In this study, patients with acute stroke and dysphagia were given an individual rehabilitation protocol and followed up.

In the literature, it has been stated that early dysphagia screening with a standard screening protocol reduces the incidence of dysphagia-associated pneumonia and that screening and advanced examination

methods should be used effectively and accurately.[15] It is more appropriate to start the dysphagia screening test with a non-liquid bolus, as most acute stroke patients have difficulty swallowing liquid boluses, and safer swallowing is observed in boluses with increased viscosity, such as nectar and pudding. In this study, the GUSS test was applied to all patients because it allows the use of multiple consistencies, starting with pudding, allowing gradual evaluation, and at the same time providing dietary recommendations to minimize the risk of aspiration during administration.[16]

Recent studies have suggested that early dysphagia rehabilitation may improve outcomes for severe AP.[17] Stegemann et al. stated that more than 90% of patients staying in long-term care centers had comorbidities requiring the use of solid form drugs and had serious difficulties in swallowing solid form drugs, and they stated that it would be easier to maintain a safe oral administration in the treatment of comorbidity with early dysphagia rehabilitation.[18]

In a study in which an exercise protocol was created for patients with dysphagia, patients were given a standard exercise program in the form of a home program once a week for 8 weeks under the supervision of a therapist. Improvement in dysphagia was observed in the follow-ups with VFS.[19] In the present study, the patients were treated with an individual rehabilitation program, not a standard rehabilitation program, and a significant improvement was found in the post-treatment dysphagia scores of the patients, similar to previous studies.[6,17]

The occurrence of pneumonia after stroke was shown to increase mortality and overall hospital care costs 3 times.[20] In a study that followed patients with dysphagia for 3 months after acute stroke, pneumonia was detected in 12% of the patients, whereas mortality was observed in 20%.[21] In this study, AP developed in only 4 patients (7.3%) during follow-up, and none of the patients died. The reason this rate was lower than that reported in the literature might be that the rehabilitation program for dysphagia was applied while following the patients.

While there are many prospective studies evaluating the risk of aspiration after stroke, there exist only a few studies investigated the predictors of dysphagia.[2,22] In studies comparing stroke patients with and without dysphagia to determine the predictors of dysphagia, no significant difference was found in terms of age, gender, smoking, alcohol use, and systemic comorbidities, consistent with this study.[1,23,24]

In a previous study, no definite relationship was found between dysphagia and oxygen demand.[1] In this study, it was observed that the severity of dysphagia increased in patients who needed oxygen. Coordinated swallowing and respiration support this result. Neurological diseases accompanied by respiratory dysfunction may cause dysphagia and may be a risk factor for aspiration.[25]

The importance of prolonged dysphagia and dysphagia prognosis is emphasized, as dysphagia may be prolonged and even permanent in patients after acute stroke, affecting quality of life. In a study evaluating the long-term predictors of dysphagia in patients with acute stroke, some parameters, such as understanding, expression, palatal movements, gag reflex, and voluntary cough, were found to be significantly different between the transient and prolonged dysphagia group.[24] In this study, the severity of dysphagia was found to be high in patients with limited tongue and lip movement, palatal asymmetry, weak/no gag reflex, and aphasia. It is thought that these parameters, which are easily evaluated in clinical practice in a short time and cost-free, will contribute to the determination of dysphagia severity and aspiration and will help to arrange a suitable rehabilitation protocol for the patient.

The National Institutes of Health Stroke Scale (NIHSS) is widely used to determine the general severity of neurological impairment in acute stroke. There exist several studies investigating the relationship between stroke severity and dysphagia. Studies have shown that stroke patients with dysphagia have a higher NIHSS score, which highlights the importance of NIHSS, which is an easy and quick test that takes time and requires equipment. Studies investigating the relationship between stroke severity and dysphagia have shown that stroke patients with dysphagia have a higher NIHSS score, similar to the current study.[2,22,26]

In this study, we determined a statistically significant positive correlation between the dysphagia score and the Barthel score. This result is supported by previous studies. It has been observed that the level of dependence in daily living activities of stroke patients negatively affects dysphagia.[1,24,27]

The number of functional teeth is considered a crucial parameter in the evaluation of oral health.[28] A holistic evaluation of oral structures is recommended in the literature. Poor oral hygiene was found to have high specificity but low sensitivity for detecting aspiration in the post-stroke population.[29,30] In this study, we determined that the swallowing function of patients with good oral hygiene was significantly improved compared with that of patients with poor oral hygiene. This demonstrates the importance of explaining, demonstrating, and maintaining oral hygiene to the patient in preventing AP and gaining swallowing function.

Consistent with this study, another study showed that whether the stroke type is hemorrhagic or ischemic does not affect the severity of dysphagia; however, there are limited studies in the related literature. Paciaroni et al. observed that the frequency of dysphagia increased in patients with hemorrhagic stroke compared with ischemic stroke, and they thought that this might be related to the severity of stroke.[1,31] In another study, dysphagia was shown more frequently in hemorrhagic patients, and it was reported that hemorrhagic stroke may be an independent predictor of prolonged dysphagia.[32] In this study, a significant difference was found between the changes in the EAT-10 score of patients with ischemic and hemorrhagic stroke before and after the application of the rehabilitation protocol. Ischemic stroke patients had a better prognosis for recovery and therefore dysphagia, which suggests that it is important to follow up patients with hemorrhagic stroke for a longer period of time. There is a need for more comprehensive studies showing the relationship between hemorrhagic stroke and dysphagia.

No comprehensive dysphagia screening and rehabilitation protocol has been found in the literature, as in this study, which screened acute stroke patients for dysphagia, followed the patient with an individual rehabilitation protocol in patients with dysphagia and evaluated the clinical parameters that could affect the severity and prognosis of dysphagia. Dysphagia screening protocols have been established for early detection of dysphagia in studies, and in a small number of studies, standard treatment protocols have been established.[19,33-35] In our study, we aimed to emphasize individual rehabilitation and reduce morbidity due to dysphagia by presenting the rehabilitation protocol and follow-up results in patients with dysphagia detected by evaluating swallowing in stroke patients from the acute period to the literature.

The most important and strong aspect of the study is that dysphagia was evaluated in the acute period. Thus, individual rehabilitation was arranged by making dietary modifications for the patients without the development of possible AP, dehydration, and malnutrition. Dysphagia, which is an important cause of mortality and morbidity, was evaluated in many aspects by closely following the patients, taking into account the severity of dysphagia and other factors affecting its prognosis. It is thought that this study will contribute to the literature by following up on patients by applying early screening and early dysphagia rehabilitation protocol and presenting the effects of the results on clinical parameters.

The absence of a control group in the early dysphagia rehabilitation was a limitation of the study. However, leaving the control group without treatment would not comply with ethical principles. Another limitation of this study was that the patients were not followed up for more than one month after discharge in terms of mortality and morbidity. The results should be supported by studies with a higher number of patients and long-term follow-up with controls.

CONCLUSION

In this study, close monitoring of acute stroke patients with dysphagia with an individual rehabilitation protocol improved dysphagia scores and reduced morbidity that may develop in patients. Dysphagia, which is an important cause of mortality and morbidity in stroke patients, should be evaluated in the acute period and followed with an individual rehabilitation protocol appropriate for the patient.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

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