



# Screening oropharyngeal dysphagia in hospitalized older adults: A prevalent problem associated with mortality

Hastanede yatan yaşlılarda orofarenjial disfaji taraması: Mortalite ile ilişkili yaygın bir problem

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## ABSTRACT

**Objective:** Oropharyngeal dysphagia (OD) is a common but underdiagnosed syndrome among older adults. The aim of this study was to assess the prevalence of OD in hospitalized older adults by using ten-item Eating Assessment Tool (EAT-10) and the relationship between mortality and OD.

**Patients and Methods:** Patients aged over 65 years admitted to an internal medicine inpatient clinic of a university hospital in Turkey were enrolled in the study. The number of drugs, the number of chronic diseases, routes of feeding (oral, parenteral, or both), length of hospital stay, albumin levels on admission day, and mortality status of the patients were recorded by a physician. The EAT-10 questionnaire was administered to all patients for OD.

**Results:** One hundred and thirty-six patients (54.4% female) were enrolled in the study. Their mean age was 74.6±6.6 years. The prevalence of OD in hospitalized older adults was 23%. The mortality rates were significantly higher in the dysphagic subjects as compared to the non-dysphagic ones (25.8% vs.10.5%; p=0.041). The number of patients with malignancy was significantly higher in the dysphagic group as compared to the non-OD subjects (41.9% vs.20%; p=0.018).

**Conclusion:** OD is a geriatric syndrome and should be screened and treated in all geriatric patients in hospitals. It will improve patient outcomes and quality of life.

**Keywords:** Hospitalization, Older patients, Oropharyngeal dysphagia, Screening, Mortality

## ÖZ

**Amaç:** Orofarenjial disfaji (OD) yaşlı yetişkinler arasında yaygın ama gözden kaçan bir sendromdur. Bu çalışmanın amacı, on maddelik Yeme Değerlendirme Aracını (EAT-10) kullanarak hastanede yatan yaşlılarda OD sıklığını saptamak ve mortalite ile ilişkisini araştırmaktır.

**Hastalar ve Yöntem:** İstanbul'da bir üniversite hastanesi iç hastalıkları servisine başvuran 65 yaş üstü hastalar çalışmaya dahil edildi. Hastaların kullandığı ilaç sayısı, kronik hastalıkların sayısı, beslenme yolları (oral, parenteral veya her ikisi), hastanede kalış süresi, başvuru günündeki albümin düzeyleri ve çıkış mortalite durumu ilgili hekim tarafından kaydedildi. OD'yi taramak için EAT-10 anketi tüm hastalara uygulandı.

**Bulgular:** Yüz otuz altı hasta (% 54,4 kadın) çalışmaya alındı. Yaş ortalaması 74,6 ± 6,6 yıl idi. Hastanede yatan yaşlı erişkinlerde OD prevalansı % 23 idi. Mortalite oranları disfajik olan hastalarda olmayanlara kıyasla anlamlı derecede yüksek bulundu (% 25,8 vs % 10,5; p=0.041). Malignite tanısı olan hastaların sayısı disfajik grupta anlamlı derecede yüksek bulundu (% 41,9 vs % 20; p=0.018).

**Sonuç:** OD geriatrik bir sendromdur. Özellikle hastanede yatan tüm yaşlı hastalarda taranmalı ve tedavi edilmelidir. Bu yaklaşım hastaların durumunu ve yaşam kalitelerini arttıracaktır.

**Anahtar kelimeler:** Hastanede yatış, Yaşlı hasta, Orofarenjial disfaji, Tarama, Mortalite

## Introduction

Oropharyngeal dysphagia (OD) is a common but not well-known condition among older people [1]. The prevalence of OD is 15%–23% in community-dwelling elders, 56%–78% in nursing homes and, with widely varying prevalence, 17%–71% in hospitalized patients [2-5]. Studies have also reported that dysphagia in the older population is associated with malnutrition [6], impaired activities of daily living [7,8], increased rates of respiratory tract infection [8], and higher mortality rates [2].

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Early diagnosis is considered to be essential in dysphagia management. Fiberoptic endoscopy and videofluoroscopy (VFS) are the gold standards to study the mechanisms of dysphagia and aspiration [9]; however, it is unfeasible to perform these on everyone with dysphagia, so different clinical screening methods have been developed to recognize patients who are at risk of aspiration [10, 11]. One of the clinical screening methods is the Eating Assessment Tool (EAT-10) [12]. This is a self-administered questionnaire performed to evaluate dysphagia symptoms in people with a wide variety of causes and in different clinical settings [13]. This questionnaire was initially developed to measure the impact of dysphagia on quality of life but has been increasingly employed as a screening tool to determine if further work-up of dysphagia symptoms is warranted [14]. It was developed to provide a reliable, rapidly administered, and valid tool for quantifying swallowing problems and treatment efficacy. An EAT-10 score  $\geq 3$  is abnormal and indicates the presence of swallowing difficulties [12].

The aim of the present study was to assess the prevalence of OD in hospitalized older adults by using EAT-10 and the relationship between mortality and OD.

## Patients and Methods

After providing voluntary written consent, 136 patients aged over 65 years who applied to the internal medicine inpatient clinic within a university hospital in Istanbul, Turkey between November 2015 and March 2016 were enrolled in the study. Patients who did not provide consent and whose length of hospitalization was less than 24 hours and also inability to respond to the EAT-10 were not enrolled in the study. The study protocol was approved by the ethics committee of Marmara University Faculty of Medicine.

The number of drugs, the number of chronic diseases, routes of feeding (oral, parenteral, or both), length of hospital stay, albumin levels on admission day, and mortality status of the patients were recorded by the same physician. The EAT-10 was self-administered by participants. For patients who could not hold a pen, the physician circled the appropriate response given by the patients (either verbally, by pointing, or a head nod) to assist completion.

The EAT-10 questionnaire was administered to all patients. Participants were asked to choose the answer that fitted their situation best by giving a score to each question. The EAT-10 consists of ten questions about the severity of symptoms of OD and its clinical and social impact on weight

loss, the ability to go out for meals, difficulty in swallowing liquid or solid consistencies, painful or stressful swallowing, difficulty in taking pills, food getting stuck in the throat, and coughing while eating. Each question is scored from 0 (no problem) to 4 (severe problem). The maximum total score is 40 points. Participants were stratified into two groups: an EAT-10 score between 0-2 and an EAT-10 score between 3 and 40, because an EAT-10 score  $\geq 3$  is abnormal and indicates the presence of swallowing difficulties [12].

### Statistical analysis

The variables were investigated to determine whether they were normally distributed. Numerical variables were given as mean  $\pm$  standard deviation for normally distributed variables, and as median (minimum–maximum) for skewed distributed continuous variables. Categorical variables were shown as frequencies. The two groups were compared with an independent sample t-test or Mann-Whitney U test when necessary. P values less than 0.05 were accepted as significant. The statistical analysis was performed using the statistical package SPSS for Windows, Version 21.0. (SPSS Inc., Chicago, IL).

## Results

### Demographic data

One hundred and thirty-six patients (54.4% female) were enrolled into the study. Their mean age was  $74.6 \pm 6.6$  years, with a mean number of drugs of  $8.3 \pm 3.7$  and a mean number of chronic diseases of  $2.9 \pm 1.5$ . Thirty-four patients (25%) had a malignancy diagnosis when admitted to the hospital. Patients with dementia and neurological disease were 2.9% and 11.8% respectively. Albumin levels were  $3 \pm 0.5$  g/dl. The number of patients fed orally was 122 (90%).

The number of dysphagic subjects according to EAT-10 score  $\geq 3$  was 31 (23%). In terms of feeding, 75% of patients were fed via the oral route in the OD group without any particular precautions being taken. The clinical characteristics of the subjects are summarized in Table I.

### Comparison of dysphagic versus non-dysphagic patients

The number of chronic diseases and admissions with pneumonia were higher in patients in the dysphagic group, but this was not statistically significant ( $3.13 \pm 1.62$  vs.  $2.92 \pm 1.5$ ;  $p=0.514$  and 29% vs. 16%;  $p=0.124$ , respectively).

Eighteen (58.6%) female patients vs. 13 male patients were in the dysphagic group. There was no significant difference between the EAT-10 scores of the female and male groups ( $p=0.686$ ).

**Table I. Demographic data of the patients (n=136)**

Parameter		
Age (years)	[74.6±6.6]	(65-98) <sup>a</sup>
Length of hospital stay (day)	[16.9±12.9]	(1-83) <sup>a</sup> (14) <sup>b</sup>
Number of chronic diseases	[2.9±1.5]	(1-8) (3) <sup>b</sup>
Number of drugs	[8.3±3.7]	(3-16) (8) <sup>b</sup>
EAT 10 score	[3.2±6.9]	(0-35) <sup>a</sup> (0) <sup>b</sup>
Female gender	74	(54.4%)
Number of patients with malignancy	34	(25%)
<b>Tumor type</b>		
• Breast	2	(6%)
• Colorectal	2	(6%)
• Lung	6	(18%)
• Prostate	2	(6%)
• Esophagus	4	(12%)
• Stomach	3	(9%)
• Hematologic malignancies	3	(9%)
• Other	12	(35%)
Feeding by oral route	122	(90%)
Exitus	19	(14%)
Dysphagia (EAT 10 score>3)	31	(23%)
Albumin level (g/dl)	[3±0.5]	(1.8-4.2) <sup>a</sup> (3) <sup>b</sup>

Data are given as mean+standard deviation. a: (minimum-maximum) b: (median)

**Table II. The comparison of dysphagic versus non- dysphagic patients (n=136)**

Parameter	Non- dysphagic patients n = 105 (77%)	Dysphagic patients n = 31 (23%)	p
Age	74.7±6.2	73.9±7.64	0.516
Length of hospital stay	12.6±16.2	13.9±19.1	0.269
Mortality	11 (10.5%)	8 (25.8%)	<b>0.041*</b>
Number of chronic diseases	2.9±1.5	3.1±1.6	0.514
Number of drugs	8.3±3.8	7.9±2.9	0.501
Admission with pneumonia	17 (16%)	9 (29%)	0.124
Number of patients with malignancy	21 (20%)	13 (41.9%)	<b>0.018*</b>
Albumin (g/dl)	3.0±0.5	2.9±0.5	0.530

Data are given as mean+standard deviation.

\*Statistically significant p values.

There was no significant difference between albumin (g/dl) levels in the non-dysphagic vs. the dysphagic group (3.0±0.5 vs. 2.9±0.5; p= 0.530).

Mortality rates were significantly higher in the dysphagic subjects as compared to the non-dysphagic ones (25.8% vs. 10.5%; p=0.041). The number of patients with malignancy was significantly higher in the dysphagic group as compared to the non-OD subjects (41.9% vs. 20%; p=0.018). Mostly, patients with lung carcinoma had a positive EAT-10 screening. The related data are presented in Table II.

## Discussion

In the present study, using the EAT-10, we found the prevalence of OD in hospitalized older adults over 65 years old to be 23%. Mortality rates were significantly higher in the dysphagic subjects.

Oropharyngeal dysphagia is a prevalent geriatric syndrome. Dysphagia affects up to 78% of elderly nursing home residents, up to 31%-71% of elderly patients admitted to the hospital, and 15%-23% of community-dwelling

elderly [2,15,16]. Similar to our study, Ercilla *et al.*, found the prevalence of OD as 20% in a geriatric hospital by using EAT-10 [17].

Although OD is highly prevalent, with morbidity, mortality, and respiratory complications like aspiration pneumonia, it is mostly underdiagnosed and undertreated [14].

Several diagnostic tools exist to assess OD. Screening tools like the EAT-10 are useful to make a first exploration to screen patients at risk of OD [12,18]. Rofes *et al.*, showed the accuracy of the EAT-10 in 120 older adults for clinical evaluation of OD [19].

In our study, there was no gender difference between the dysphagic and non-dysphagic groups. There are conflicting results on association of OD with gender. Some studies suggest that it is associated with males [20], whereas some other studies suggest that gender is not a risk factor for OD [5].

In the present study, polypharmacy was an important geriatric syndrome. Our patients were using at least three medications. Similar to our study, Carrion *et al.*, stated that polypharmacy was high and similar among patients both with and without OD [6].

Dementia and neurological diseases were significantly associated with OD [6,21]. OD does not only cause swallowing difficulties (malnutrition, and dehydration), but also has the potential to cause serious complications such as dehydration and aspiration pneumonia [22]. However, such an association was not observed in our study, which was probably related to the low prevalence (2.9% vs. 11.8 %) of each condition.

Dysphagia can contribute to malnutrition. Serra-Prat *et al.*, showed that those at risk of malnutrition were estimated at 18.6% of elderly adults with dysphagia, and 12.3% of elderly adults without dysphagia [23]. Carrion *et al.* stated that dysphagia was an independent risk factor for malnutrition [6], and that serum albumin levels of OD patients were lower than the non-OD patients. Our study, did not show a significant difference between dysphagic and non-dysphagic groups, but albumin was a negative acute phase protein also affected by an inflammatory state [24]. Our patients were hospitalized with acute and chronic medical conditions that influenced albumin levels. So its levels did not reflect nutritional status directly.

Dysphagia is common in cancer patients [25]. In the present study, the number of patients with malignancy was significantly higher in the dysphagic group as compared to

the non-OD subjects. Similar to our findings, Carrion *et al.* found the same relation between OD and neoplasia [6].

Dysphagia has been associated with increased mortality and morbidity [26,27]. We found that OD is a risk factor for mortality but discerned no difference in length of hospital stay. A recent study observed that in patients admitted for stroke, OD prolongs length of stay by almost 40% and is associated with 30.5% hospital mortality (vs. 2.8% in patients with non-OD) [28]. The difference between the results of that study and our own results might be related to the low prevalence of stroke patients in our care unit.

Many patients suffering from OD are not aware of their condition. In the present study, 75% of patients were fed via the oral route in the OD group without any precautions such as postural strategies and maneuvers or food modifications using thickeners.

The limitations of this study were as follows: First, the study sample was obtained from one institution, which may limit the generalization of the results. Second, forms of patient nutritional status other than serum albumin levels must be evaluated. Third, the cross-sectional design did not allow for causative analysis.

In conclusion, this is the first study assessing the prevalence of OD in our country. OD is a geriatric syndrome and should be screened and treated in all geriatric patients in hospitals. It will improve patient outcomes and quality of life. The EAT-10 represents a screening tool yielding high clinical utility in this challenging patient population and is recommended in clinics to determine the need for further, more comprehensive, instrumental evaluation of swallowing function.

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