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RESEARCH

# SWALLOWING IN ELDERLY INDIVIDUALS: SILENT DYSPHAGIA RISK ASSESSMENT IN THE ENT OUTPATIENT CLINIC

## Abstract

***Introduction:*** Advancing age may cause deterioration of the cartilaginous and myoelastic structures of the larynx, leading to dysphagia. This study aimed to assess dysphagia and swallowing-related quality of life in elderly individuals presenting to the ENT outpatient clinic with no dysphagia complaint.

***Materials and Method:*** Among 1829 patients who visited the ENT outpatient clinic between February 2017 and September 2018, 745(379 females, 366 males; mean age 74.27±6.32 years) volunteered to participate. These individuals had no swallowing problems or any disease that could affect swallowing, drug use, neurological disorder or history of head and neck surgery. The patients were assessed using swallowing-related quality of life scale and Eating Assessment Tool-10.

***Results:*** According to the Eating Assessment Tool-10 scores, 550 patients(mean age 72.00±4.45 years) had normal swallowing and 195(mean age 80.68±6.44 years) had dysphagia. There was a significant difference regarding age and swallowing-related quality of life scale scores were statistically significant between the normal swallowing and dysphagia groups. Regarding diagnosis at admission, no significant intergroup differences were observed. On assessing the distribution of both scale scores according to the age groups (65–69, 70–79, 80–89, and 90–99 years), significant differences were observed among all groups. There was a significant correlation between increased scores and increasing age.

***Conclusion:*** Dysphagia is a common problem in older individuals. However, most patients with dysphagia do not visit physicians for this problem. It should be remembered that swallowing problems are often diagnosed when patients present to outpatient clinics for other complaints.

***Keywords:*** Dysphagia; Aged; Deglutition disorders

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ARAŞTIRMA

# YAŞLI BİREYLERDE YUTMA: KBB POLİKLİNİĞİNDE SESSİZ DİSFAJİ RİSK DEĞERLENDİRMESİ

## Öz

***Giriş:*** İlerleyen yaş larinksin kıkırdak ve miyoelastik yapılarının bozulmasına ve disfajiye neden olabilir. Bu çalışma, KBB polikliniğine başvuran disfaji şikayeti olmayan yaşlı bireylerde yutma güçlüğü ve yutma ile ilişkili yaşam kalitesini değerlendirmeyi amaçlamıştır.

***Gereç ve Yöntem:*** Şubat 2017-Eylül 2018 tarihleri arasında KBB polikliniğine başvuran 1829 hasta arasından 745'i (379 kadın, 366 erkek; ort. Yaş 74.27±6.32 yıl) çalışmaya gönüllü oldu. Bu kişilerde yutma problemi veya yutmayı etkileyebilecek herhangi bir hastalık, ilaç kullanımı, nörolojik bozukluk veya baş boyun bölgesine ameliyat öyküsü mevcut değildi Hastalar, yutma ile ilişkili yaşam kalitesi ölçeği ve Yeme Değerlendirme Aracı-10 kullanılarak değerlendirildi.

***Bulgular:*** Yeme Değerlendirme Aracı-10 puanlarına göre 550 hasta (ort. Yaş 72.00±4.45 yıl) normal yutma, 195 hastada (ort. Yaş 80.68±6.44 yıl) disfaji vardı. Yaş ve yutma ile ilişkili yaşam kalitesi ölçek puanları açısından normal yutma ve yutma güçlüğü grupları arasında istatistiksel olarak anlamlı fark saptandı. Başvuru sırasındaki tanı açısından gruplar arasında anlamlı bir fark gözlenmedi. Her iki ölçek puanının da yaş gruplarına göre dağılımını değerlendirirken (65-69, 70-79, 80-89 ve 90-99 yaş), tüm gruplar arasında anlamlı farklılıklar gözlendi. Skorların artması ile yaşın artması arasında anlamlı bir ilişki vardı.

***Sonuç:*** Disfaji yaşlı bireylerde sık görülen bir sorundur. Ancak, disfajili hastaların çoğu bu sorun için hekimleri ziyaret etmemektedir. Başka şikayetlerle polikliniğe başvuran hastalarda yutma sorunlarının sıklıkla teşhis edildiği akılda tutulmalıdır

***Anahtar sözcükler:*** Disfaji; Yaşlı; Yutma bozuklukları

## INTRODUCTION

Difficulty in swallowing, known as dysphagia, is one of the common problems faced by elderly individuals, and its increased incidence is increasing in the aging population (1.) Although the prevalence of dysphagia increases with age, it has been reported to exist in a wide rate range of 11%–68% (1,2). The most significant outcomes of dysphagia in the elderly are morbidities such as malnutrition and dehydration and aspiration pneumonia, which results in mortality in almost half of the patients (3). Furthermore, studies have reported that almost all pneumonias observed in the elderly are related to aspiration (4).

The most common causes of dysphagia in the elderly are neurological diseases such as stroke, Parkinson's disease, and dementia, which are commonly observed in the elderly (3). Oropharyngeal dysphagia (OD) associated with these diseases is the primary cause of most aspirations. Dysphagia may also be observed as a result of aging. Presbyphagia is a term used for the structural and physiological changes related to aging that are observed in all phases of swallowing (5). Presence of dysphagia in up to 30% of the elderly individuals living independently and not necessarily leading to dysphagia primarily has been reported (1,2). However, no specific incidence rate has been reported. The symptoms of OD related to old age are often accepted as age-related changes, for which medical advice is usually not sought, and may be compensated by the patient because they develop slowly. Notably, the patient may be aware of the situation because of the compensatory mechanisms used, such as reducing the volume and changing the type of food (6). Lack of awareness and/or using compensatory mechanisms may not necessarily lead to complications that increase the risk of aspiration-related morbidity and mortality. Nonetheless, eating and swallowing is a social behavior, and the patient's quality of life may be severely affected.

Although dysphagia due to comorbidities such as neurological disease accompanied by age is well defined, dysphagia in healthy elderly who had no complaint dysphagia and who had no disease that may cause dysphagia is not known exactly (7,8).

Otorhinolaryngology is the branch of medical science that deals with swallowing. Therefore, it is the most important and primary branch that can intervene in case of lack of awareness in both the elderly and the clinicians regarding the risk of dysphagia.

Therefore, we need to ask ourselves the following questions considering the increase in the number of admissions to our clinics, especially that of the elderly:

1) Is there any risk of OD that may lead to aspiration in the elderly patient who has presented to our clinic with a complaint other than that of difficulty in swallowing?

2) Is there an increase in the risk with the increase in age?

3) Could the presence of OD risk alone affect the quality of life, even though there is no symptom or complaint?

This study aimed to investigate the OD risk in elderly patients presenting to our clinics with complaints other than symptoms/findings of dysphagia and demonstrate the effect of the relationship between the increase in age and the quality of life.

## MATERIALS AND METHOD

### Study design

The study was conducted in a cross-sectional design comprising 800 patients aged ≥65 years who presented to our ear-nose-throat (ENT) outpatient clinics with complaints other than difficulty in swallowing.

### Participants

The participants included patients aged 65

years, who could sit properly, communicate, had the mental wellness for cooperation, and had no the primary complaint of difficulty in swallowing. Those with known dysphagia, speaking disorder, limited cooperation and orientation, a history of head-neck surgery, malignancy, diagnosed psychiatric disorder, progressive or non-progressive neurological disease that may affect swallowing, gastrointestinal system disease, ear, nose and throat disease which may affect swallowing or those with symptoms/findings of esophageal dysphagia were excluded.

Patients were informed about the study, and their written consents were obtained at the beginning of the study. The approval was obtained from the local Ethical Board of the hospital, and the study was conducted accordant with the principles of the Helsinki Declaration.

### Data Collection

Demographic characteristics including age, gender, and diagnosis on admission were recorded.

### Swallowing Assessments

1. Eating Assessment Tool-10 (EAT-10) (9)

The Eating assessment tool (EAT-10) is a scale that evaluates dysphagia and contains 10 questions with each question scored between 0 and 4 (no problem to severe problem). The total EAT-10 score is calculated by adding the score obtained in each question, with the total score ranging between 0 and 40. A score of 3 or higher was considered as risk of OD.

2. Swallowing-related quality of life scale (SWAL-QOL) (10)

The swallowing-related quality of life scale (SWAL-QOL) is used to evaluate the effect of swallowing disorders on the quality of life. This scale contains 44 questions on eating disorders, duration of eating, appetite, food selection, communication, anxiety, mental health, social functioning, fatigue, and sleep. Each question is scored between 1 (worst) and 5 (best). Each field may be assessed separately. The total score was used in our study.

### Study Protocol

All participants were assessed using EAT-10 and SWAL-QOL. They were grouped as no OD and OD risk based on their EAT-10 scores, and the parameters were compared between groups. The correlation between significant parameters was investigated. The subjects were grouped as 65–69 years (group 1), 70–79 years (group 2), 80–89 years (group 3), and 90–99 years (group 4) to investigate any age-related effects and their EAT-10 and SWAL-QOL scores were compared.

### Statistical Analysis

Statistical Package for the Social Sciences (SPSS 22.0 for Windows) software package was used in the analysis of the data. In descriptive statistics, the data were expressed as the mean ± standard deviation for continuous variables, and as frequencies and percentages (%) for nominal variables. Normality was evaluated using the Kolmogorov-Smirnov test (all parameters were normally distributed). Based on their EAT-10 scores, the patients were divided into two groups: dysphagic and normal swallowing. Significant intergroup differences were analyzed using t-test and ?2 test. Correlations between the age, SWAL-QOL, and EAT-10 were examined using the Pearson correlation coefficient. Logistic regression analysis was performed to examine the associations between potential independent predictors (age and SWAL-QOL scores) and EAT-10 scores (dependent variable). Based on the age, participants were divided into four groups as 65–69 years (group 1), 70–79 years (group 2), 80–89 years (group 3), and 90–99 years (group 4). Evaluation parameters of age groups were analyzed using analysis of variance test. A p value of $<0.05$ was considered statistically significant.

## RESULTS

Of the 745 patients, 366 (50.9%) were females and 366 (49.1%) were males. The mean patient age was

74.27 ± 6.32 years. The patient characteristics are presented in Table 1.

**Table 1.** Demographic and clinical characteristics of the patients aged ≥65 years at the initial presentation to the strabismus clinic

| Parameters | N=745 (mean±SD), n(%) |
|---|---|
| **Age (year)** | 74.27±6.32 |
| **Gender** | |
| Female | 379 (50.9) |
| Male | 366 (49.1) |
| **Diagnosis** | |
| Hearing loss | 239 (32.1) |
| Cerumen | 84 (11.3) |
| Acute pharyngitis | 85 (11.4) |
| Chronic otitis media (COM) | 43 (5.8) |
| Epistaxis | 20 (2.7) |
| Common cold | 50 (6.7) |
| Allergic rhinitis | 41 (5.5) |
| Acute sinusitis | 28 (3.8) |
| Tinnitus | 72 (9.7) |
| Otitis externa | 45 (6.0) |
| Vertigo | 21 (2.8) |
| Nasal polyp | 11 (1.5) |
| Acute tonsillitis | 6 (0.8) |
| **EAT-10** | 1.95±1.60 |
| **Swal-Qol** | 52.81±14.92 |

SD: standard deviation; EAT-10: Eating Assessment Tool-10; Swal-Qol:Swallowing Quality of life

Based on the EAT-10 scores, 550 (73.8%) patients had normal swallowing with the mean age of 72.00 ± 4.45 years, and 195 (26.2%) patients had OD risk with the mean age of 80.68 ± 6.44 years. Regarding the diagnosis on admission, no significant intergroup differences were determined (p = 0.121). The age and Swall-QoL scores were statistically significant between the normal swallowing and OD risk groups (p=0.001) (Table 2).

The correlation and regression analyses between age and EAT-10 and SWAL-QOL scores, which showed significance, and the distribution of scale outcomes for ages are demonstrated in Tables 3–5.

Comparison of EAT-10 and SWAL-QOL scores of different age groups showed statistically significant differences among all groups (all of them, p = 0.001).

Accordingly, the correlation between age and each score of EAT-10 and SWAL-QOL scales were significant, and an increase in the EAT-10 and SWAL-QOL scores were noted with the increase in age (p = 0.001). Therefore, age was defined as an independent factor that affected the EAT-10 scores.

## DISCUSSION

This study aimed to investigate OD risk in elderly patients presenting to the ENT clinics with complaints other than difficulty in swallowing and to demonstrate the effect of the relationship between the increase in age and the quality of life. We observed that regardless of the clinical diagnosis, with advancing age, the OD risk was increased and the quality of life was impaired.

Like the changes in all other systems of the body, swallowing function also changes with age. Age-related structural and physiological changes cause a predisposition to dysphagia, just like other age-related diseases. Reduction in the mass of the muscles involved in swallowing and connective tissue elasticity results in loss of strength and movement (11-13). These age-related changes have negative effects on the passage of food from the mouth to the stomach effectively and safely. Generally, a deceleration is observed in the swallowing process with aging (12). More time is required for food preparation in the oral phase, the swallowing reflex trigger is delayed, and all transit mechanisms are decelerated. These changes may seem non-significant and may result in no symptoms, but they may be cumulative

**Table 2.** Distribution of parameters according to the EAT-10 scores.

| | Normal swallowing (n=550) (mean±SD), n(%) | Dysphagia (n=195) (mean±SD), n(%) | P |
|---|---|---|---|
| **Age** (year) | 72.00±4.45 | 80.68±6.44 | 0.001 |
| **Gender** | | | |
| Female | 279 (50.7) | 100 (51.3) | 0.894 |
| Male | 271 (49.3) | 95 (48.7) | |
| **Diagnosis** | | | |
| Hearing loss | 171 (31.1) | 68 (34.9) | |
| Cerumen | 59 (10.7) | 25 (12.8) | |
| Acute pharyngitis | 70 (12.7) | 15 (7.7) | |
| COM | 32 (5.8) | 11 (5.6) | |
| Epistaxis | 15 (2.7) | 5 (2.6) | |
| Common cold | 41 (7.5) | 9 (4.6) | 0.121 |
| Allergic rhinitis | 37 (6.7) | 4 (2.1) | |
| Acute sinusitis | 21 (3.8) | 7 (4.6) | |
| Tinnitus | 62 (11.3) | 10 (5.1) | |
| Otitis externa | 36 (6.5) | 9 (4.6) | |
| Vertigo | 0 | 21 (10.8) | |
| Nasal Polyp | 0 | 11 (5.6) | |
| Acute tonsillitis | 6 (1.1) | 0 | |
| Swal-Qol | 47.36±12.53 | 68.20±9.30 | 0.001 |
| EAT-10 | 1.19±0.76 | 4.11±1.37 | 0.001 |

SD: standard deviation; EAT-10: Eating Assessment Tool-10; Swal-Qol:Swallowing Quality of life

and lead to increased penetration frequency of the swallowed bolus into the upper airways and to increasing amount of residues observed after swallowing. When age-related sensorimotor changes are also added to the aforementioned, it contributes to clinically significant dysphagia and related complications (14). In our study, we observed the risk of OD in one-fourth of patients older than 65 years regardless of the diagnosis on admission. Furthermore, we observed that this risk positively correlated with the increase in the age of the patients.

Our study did not include patients with a complaint of dysphagia or those who had any neurological/non-neurological disease that may lead to dysphagia. Therefore, neither the patients nor the clinicians had any concern regarding dysphagia or its complications, such as malnutrition, dehydration, pneumonia, or even death.

Studies in the literature have reported that the incidence of pneumonia is exacerbated, the functional loss is increased, and the quality of life is further impaired with advancing age of the patient (3,15). Aspiration-related pneumonia and pneumonia-related mortality rates have been demonstrated to increase with age (3,16-18). To our knowledge, no study has investigated the age-related changes and the presence of age-related diseases together. However, nutritional studies have reported 10%–15% malnutrition owing to

**Table 3.** Distribution of EAT-10 and Swal-Qol scores according to the age groups.

| | 65-69 years (n=222) (mean±SD) | 70-79 years (n=368) (mean±SD) | 80-89 years (n=141) (mean±SD) | 90-99 years (n=14) (mean±SD) |
|---|---|---|---|---|
| EAT-10 | 0.65±0.98 | 1.98±1.06 | 3.51±1.39 | 6.21±1.67 |
| Swal-Qol | 36.57±9.41 | 56.11±9.44 | 67.17±9.03 | 79.05±6.92 |

SD: standard deviation; EAT-10: Eating Assessment Tool-10; Swal-Qol:Swallowing Quality of life

reduction or deceleration in nutritional intake and change in nutrients in community-dwelling elderly, even in the absence of known dysphagia (19). We believe that this low nutritional situation reduces the functional capacity of the patient, thereby impairing the quality of life, with age and age-related changes having indirect effects.

Although our study was a wide-scale study, it had some limitations. Flexible fiberoptic endoscopy and videofluoroscopy are the conventional methods used to diagnose OD; however, scales, which are rapid, cheap, easy to use, and non-invasive, are used widely to identify patients for further examination (20,21). In our study, the EAT-10 scale test was used because of the high number of patients and ease of applicability in the outpatient clinic environment, and hence, the gold standard methods were not used. Nonetheless, we believe that further extensive research on the elderly population using the conventional techniques will make the outcomes of our study more understandable.

In conclusion, age is an independent factor for OD risk in elderly people. In clinical practice, the ENT department is capable of diagnosing dysphagia using the flexible fiberoptic endoscopy method, which we believe should be considered by the clinicians practicing social preventive medicine to assess elderly patients with no complaint of swallowing difficulty.

Conflict of Interest. The authors have no conflict of interest to declare.Patients who did not undergo curative resection for colorectal cancer, those treated with Hartmann procedure or transanal local resection, those treated only with deflective stoma, those with missing data, and those who were operated under emergency conditions were excluded from the study. According to the American Joint Commission on Cancer (AJCC) TNM staging (13), patients with middle and lower rectal carcinoma other than T1 received neoadjuvant chemoradiotherapy (CRT) and total

**Table 4.** Correlations between the age, Swal-Qol and EAT-10 scores.

| | Age (r/p) | EAT-10 (r/p) | Swal-Qol (r/p) |
|---|---|---|---|
| Age | | 0.721/0.001 | 0.763/0.001 |
| EAT-10 | 0.721/0.001 | | 0.791/0.001 |
| Swal-Qol | 0.763/0.001 | 0.791/0.001 | |

r: correlation coefficient, EAT-10: Eating Assessment Tool-10; Swal-Qol:Swallowing Quality of life

**Table 5.** Regression analysis of significantly correlation.

| | B | SE | 95%CI (lower-upper)for B | p |
|---|---|---|---|---|
| Age | 0.071 | 0.008 | 0.055-0.088 | 0.001 |
| Swal-Qol | 0.062 | 0.004 | 0.055-0.069 | 0.001 |

OR: odds ratio, CI: coefficient interval, SE: Standard error

mesorectal excision was performed 8–10 weeks after CRT. A protective ileostomy was routinely performed following anastomosis below the peritoneal reflection in patients with rectal tumor who received neoadjuvant CRT. The decisions were made on a case-by-case basis for the remaining patients with upper rectal and colonic tumors considering their general condition and depending on technical issues encountered both during anastomosis and during the perioperative period. In our study, all patients who underwent surgery for colorectal cancer under elective conditions underwent resection and anastomosis with or without stoma.

### Outcome measure and other variables

Patients included in the study were divided into two groups: patients aged <65 years (Group 1) and those aged ≥65 (Group 2). Demographic characteristics, perioperative risks, diseased colonic segment, neoadjuvant CRT, and surgical procedure (laparoscopic/open) were evaluated between both groups. The primary endpoint of the study was AL that developed within 30 days postoperatively. The secondary endpoint was AL-related mortality within 30 days postoperatively.

### Statistical analysis

SPSS 22.0 (IBM Corporation, Armonk, New

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