



Original Article

Analysis of dysphagia risk using the modified dysphagia risk assessment for the community-dwelling elderly

HAEWON BYEON, DrSc¹⁾

¹⁾ Department of Speech Language Pathology, Nambu University: 23 Cheomdan Jungangro, Gwangsan-gu, Gwangju 506-706, Republic of Korea

Abstract. [Purpose] The elderly are susceptible to dysphagia, and complications can be minimized if high-risk groups are screened in early stages and properly rehabilitated. This study provides basic material for the early detection and prevention of dysphagia by investigating the risks of dysphagia and related factors in community-dwelling elders. [Subjects and Methods] Participants included 325 community-dwelling elderly people aged 65 or older. The modified dysphagia risk assessment for the community-dwelling elderly was used to assess dysphagia risk. [Results] Approximately 52.6% (n=171) of participants belonged to the high-risk group for dysphagia. After adjusting for confounding variables, people aged 75+, who used dentures, and who needed partial help in daily living had a significantly higher risk of dysphagia. [Conclusion] It is necessary to develop guidelines for dysphagia for early detection and rehabilitation.

Key words: Dysphagia risk assessment scale, Prevalence, Community-dwelling elders

(This article was submitted Mar. 26, 2016, and was accepted May 23, 2016)

INTRODUCTION

Although the development of medical technologies is prolonging the average human life span, longevity does not necessarily mean prolonged healthy life. In 2014, the average life expectancy for Koreans was 81 years, but the average healthy life was only 71 years, indicating that most people are likely to suffer from disease in their last decade¹⁾.

Geriatric diseases refer to chronic diseases that occur in old age, such as degenerative diseases like dementia and cerebrovascular diseases like stroke. Dysphagia, which results in eating problems, is caused by stroke, dementia, Parkinson's disease, malignant tumors, and gastroesophageal reflux disease²⁻⁴⁾, and it is one of the most common diseases for which patients visit rehabilitation clinics.

Sustained dysphagia not only causes serious health problems, such as malnutrition and weight loss, but can also lead to complications, such as aspiration pneumonia, and even death⁵⁾. In addition, dysphagia in old age causes anxiety about eating⁶⁾, negatively affecting not just psychological health, but quality of life as well⁷⁾.

The lifetime dysphagia prevalence among the Korean elderly in local communities is 17.1%, meaning that as much as one-fifth of the elderly Korean population experiences dysphagia¹⁾, higher than elderly people in the U.K. (11.4%), Australia (16%), and Japan (13.8%)^{6, 8, 9)}. Nevertheless, unlike hospitalized patients, community-dwelling elderly people do not always recognize dysphagia and tend to consider it one of the symptoms of aging, and so only a very small proportion actually seek or receive treatment¹⁰⁾.

If the risk factors of dysphagia are investigated and well managed, complications (e.g., aspiration pneumonia) can be minimized. Complications and medical costs can be reduced by screening high-risk groups in early stages and providing proper rehabilitation¹¹⁾. Nonetheless, previous studies^{2, 3)} on dysphagia have only investigated dysphagia patients' physiological

Corresponding author. Haewon Byeon (E-mail: bhwpuma@naver.com)

©2016 The Society of Physical Therapy Science. Published by IPEC Inc.

This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives (by-nc-nd) License <<http://creativecommons.org/licenses/by-nc-nd/4.0/>>.

Table 1. General characteristics of subjects (n=325)

Variables	Category	n (%)
Age	Mean ± SD	73.1 ± 8.3
Gender	Male	108 (33.2)
	Female	217 (66.8)
Education	≤Middle school	28 (70.3)
	≥High school	97 (29.7)
Marital status	Married	277 (85.1)
	Separated/divorced, widowed	48 (14.9)
Average monthly household income	≤2 million won	273 (83.9)
	≥2 million won	52 (16.1)
Smoking	Yes	69 (21.3)
Drinking	Yes	138 (42.5)
Physical function	Independence	229 (70.5)
Depression	Yes	105 (32.3)
Dentures	Yes	266 (81.7)

Table 2. Multiple logistic regression analysis for dysphagia risk factors

Variables	Category	Exp (B)	95.0% CI
Age	75–84	3.25*	1.18–5.83
Physical function	partial dependence	4.29*	1.85–8.61
Dentures	Yes	1.56	1.05–3.05

CI: confidence interval.

*p<0.05

changes, and few studies have examined the risk of dysphagia among community-dwelling elders.

This study provides basic material for the early detection and prevention of dysphagia by investigating the risks of dysphagia in community-dwelling elders and related factors.

SUBJECTS AND METHODS

The subjects were selected by convenience sampling from elderly adults at five senior citizen centers in the Seoul and Incheon metropolitan areas from February to May 2015. Ultimately, 325 elderly (108 males and 217 females) were analyzed, after excluding 15 people with incomplete survey responses and 21 who had withdrawn. The required minimum sample size was 74 people at a significance level of (α)=0.05, effect size of 0.15, and power of test (1- β)=0.95, determined using G-power version 3.1.7; therefore, our experimental sample size was appropriate. All participants provided voluntary informed consent to participate in the study. This protocol was approved by the Institutional Review Board of Nambu University, and was conducted in accordance with the ethical standards of the Declaration of Helsinki. The questionnaire survey was conducted using a one-on-one interview method by pre-trained researchers with structured questionnaires. Subjects without neurological diseases such as stroke, dementia, and Parkinson's disease, and who were literate were selected for participation.

A modified dysphagia risk assessment for the community-dwelling elderly (DRACE)¹² was used for assessing dysphagia risk. DRACE has a total of 23 items, and is composed of four phases: pharyngeal dysphagia, swallowing the "wrong way", oral cavity dysphagia, and esophageal dysphagia. Fewer than 6 points out of a possible 69 indicates normal swallowing, while six or more points indicates risk of dysphagia. The Cronbach's alpha for this tool was 0.93.

The short form of the Korean version of the Geriatric Depression Scale¹³ was used to assess depression, and the Korean Activities of Daily Living¹⁴ was used to assess physical functioning.

Confounding factors included age (65–74, ≥75), gender, marital status (married, divorced/separated/widowed), level of education (middle school and lower, high school or higher), average monthly household income (<2 million won, ≥2 million won), smoking (yes, no), drinking (yes, no), dentures (yes, no), depression (yes, no), and physical function (independence, partial dependence).

Data was analyzed using SPSS version 23.0 (SPSS Inc., Chicago, IL, USA). An independent t-test was used for differences in characteristics based on dysphagia risk, and multiple logistic regression analysis was used for the risk factors of dysphagia.

RESULTS

The general characteristics of subjects are shown in Table 1. According to DRACE, 52.6% (n=171) of participants belong to the high-risk group for dysphagia. Those over the age of 75, those who use dentures, and those who need partial help in the daily living had a higher proportion of high-risk for dysphagia (independent t-test, p<0.05). Even after adjusting for confounding variables, those aged 75+ (Exp(B)=3.25), those who use dentures (Exp(B)=1.56), and those who need partial help in daily living (Exp(B)=4.29) had significantly higher risk of dysphagia (Table 2).

DISCUSSION

Our results show that 52.6% of participants belonged to the high-risk group for dysphagia. This is consistent with Whang's study¹², that reported that one out of every two Korean elderly individuals were at high risk for dysphagia. The risk of dysphagia in community-dwelling elderly people in Korea was higher than in the U.S. (33%) and Japan (47%)^{6, 15}. Since the elderly not only lack knowledge of dysphagia but also tend to consider it a natural process of aging¹⁰, education on dysphagia and constant monitoring are required for those at high risk.

Older age, use of dentures, and poor physical functioning were factors linked to an increased risk of dysphagia. Previous studies have reported that dysphagia risk increases with age, associated with age-related declining muscle strength and degeneration of nerve conduction velocity^{4, 8, 12}. In particular, we found that the elderly needing partial assistance in their daily living experienced as much as a 4.3-fold higher risk for dysphagia, implying that the maintenance of physical functioning is important for effective swallowing. In addition, those with dentures had a 1.6-fold higher risk for dysphagia than those who did not, presumably because dentures decrease the secretion of saliva, causing formation of food bolus obstructions¹².

Although the elderly with dentures and the elderly who need partial help in daily living are at a high risk of dysphagia, educational programs on dysphagia are conducted mainly for hospitalized patients in medical institutions, and there are very few programs for the community-dwelling elderly⁸. As the decline of physiological functioning during old age is affected not simply by aging but also by decreased activity, it is necessary to develop programs aimed at preserving the swallowing function of those at a high risk for dysphagia.

Regarding the limitations of this study, the subjects of the study were community-dwelling elderly adults in certain regions, and so the results are difficult to generalize. Moreover, as this study had a cross-sectional design, its results cannot be interpreted as indicating a causal relationship.

In conclusion, one out of two community-dwelling elderly individuals belonged to the high-risk group for dysphagia. It is necessary to develop guidelines for early detection of dysphagia and rehabilitation.

REFERENCES

- 1) Health and Welfare Ministry: Health and Welfare Ministry survey elderly living conditions and welfare needs across the country, Seoul: Health and Welfare Ministry, 2009.
- 2) Higashijima M: Relationship between swallowing dysfunction and decreased respiratory function in dementia patients. *J Phys Ther Sci*, 2013, 25: 941–942. [[Medline](#)] [[CrossRef](#)]
- 3) Higashijima M, Kurozumi C, Nakao Y: Two-dimensional kinetic analyses of swallowing using videofluorographic images of dysphagia patients. *J Phys Ther Sci*, 2012, 24: 387–390. [[CrossRef](#)]
- 4) Logemann JA: Swallowing disorders. *Best Pract Res Clin Gastroenterol*, 2007, 21: 563–573. [[Medline](#)] [[CrossRef](#)]
- 5) Shiozu H, Higashijima M, Koga T: Association of sarcopenia with swallowing problems, related to nutrition and activities of daily living of elderly individuals. *J Phys Ther Sci*, 2015, 27: 393–396. [[Medline](#)] [[CrossRef](#)]
- 6) Roy N, Stemple J, Merrill RM, et al.: Dysphagia in the elderly: preliminary evidence of prevalence, risk factors, and socioemotional effects. *Ann Otol Rhinol Laryngol*, 2007, 116: 858–865. [[Medline](#)] [[CrossRef](#)]
- 7) Ohara Y, Hirano H, Watanabe Y, et al.: Masseter muscle tension and chewing ability in older persons. *Geriatr Gerontol Int*, 2013, 13: 372–377. [[Medline](#)] [[CrossRef](#)]
- 8) Holland G, Jayasekera V, Pendleton N, et al.: Prevalence and symptom profiling of oropharyngeal dysphagia in a community dwelling of an elderly population: a self-reporting questionnaire survey. *Dis Esophagus*, 2011, 24: 476–480. [[Medline](#)] [[CrossRef](#)]
- 9) Eslick GD, Talley NJ: Dysphagia: epidemiology, risk factors and impact on quality of life—a population-based study. *Aliment Pharmacol Ther*, 2008, 27: 971–979. [[Medline](#)] [[CrossRef](#)]
- 10) Park S: Dysphagia risk and associated factors among community-dwelling elders. *J Kor Soc Food Sci Nut*, 2015, 44: 49–56. [[CrossRef](#)]
- 11) Bang HL, Park YH: Development of evidence-based dysphagia nursing care protocol for nursing home residents. *J Muscle Jt Health*, 2013, 20: 31–42. [[CrossRef](#)]
- 12) Whang SA: Prevalence and influencing factors of dysphagia risk in the community-dwelling elderly. *J Kor Gerontol Soc*, 2014, 34: 37–48.
- 13) Cho MJ, Bae JN, Suh GH, et al.: Validation of geriatric depression scale, Korean version in the assessment of DSM-rsiontors depression. *J Korean Neuropsychiatr Assoc*, 1999, 38: 48–63.
- 14) Won CW, Rho YG, Kim SY, et al.: The validity and reliability of Korean activities of daily living scale. *J Korean Geriatr Soc*, 2002, 6: 98–106.
- 15) Kawashima K, Motohashi Y, Fujishima I: Prevalence of dysphagia among community-dwelling elderly individuals as estimated using a questionnaire for dysphagia screening. *Dysphagia*, 2004, 19: 266–271. [[Medline](#)] [[CrossRef](#)]