Factors associated with sarcopenic dysphagia in community-dwelling older adults

Hyun dong Kim[1], Nami Han[1], Heesung Nam[1], Jisu Park[2]
[1]Inje University Busan Paik Hospital, Department of Physical Medicine and Rehabilitation.
[2]Research Institute for Korean Medicine, Pusan National University, Yangsan, South Korea.

Objective

Sarcopenic dysphagia is an important public health issue, with the increase in the elderly population worldwide, South Korea is showing a faster increase in the elderly population. The purpose of this study is to investigate the risk of sarcopenic dysphagia in healthy community-dwelling older adults to analyze the association between myophysiological factors related to swallowing function and oral health factors and sarcopenic dysphagia.

Methods

The study included 113 participants (39 men and 74 women) aged 65 years or older who could walk independently or with walking aids for at least 50 meters, had normal cognitive function or mild cognitive impairment as determined by a screening test, and had no history of diseases causing dysphagia. The diagnostic algorithm for sarcopenic dysphagia was used to screen older adults at risk. Orofacial muscle strength (tongue, buccinator, lips) was measured with the Iowa Oral Performance Instrument, tongue and masseter thickness with portable ultrasound, and maximum occlusal force with InnoByte. Dysphagia severity was assessed using the Eating Assessment Tool, oral health-related quality of life with the Korean Oral Health Impact Profile, and oral mucosal moisture with the Mucus device. To analyze factors related to sarcopenic dysphagia, a one-way analysis of variance (ANOVA) followed by Scheffé test, and multiple regression analysis was conducted.

Results

This study found that approximately 47% of healthy older adults in the community were at risk of sarcopenic dysphagia. Key factors related to sarcopenic dysphagia included reduced orofacial muscle strength (tongue, buccinator, lips), decreased tongue and masseter thickness, lower occlusal force, higher dysphagia severity perception, poorer oral health, and reduced oral mucosal moisture. (Table 1, 2) Influential factors were tongue strength and thickness, oral mucosal moisture, and resting masseter thickness. (Table 3)

Conclusion

Based on our findings, as we expected, a higher incidence of osteoporosis was observed in women. Moreover, in general the Based on these findings, we suggest that screening for swallowing function through sarcopenic dysphagia-related factors and implementing management strategies, such as strengthening orofacial muscles and preventing oral dryness, are essential for the recovery and maintenance of swallowing function.

Table 3. Factors influencing the risk of sarcopenic dysphagia

	OR (95% CI)	p
Oral mucosal moisture level	0.482(0.319-0.728)	.001**
Tongue strength	0.672(0.565-0.801)	.000***
Buccinator strength	0.985(0.793-1.223)	.889
Lip strength	.999(0.791-1.262)	.993
Tongue thickness	0.639(0.525-0.778)	.000***
Masseter thickness; rest	14.445(1.615-129.195)	.017*
Masseter thickness; contraction	0.483(0.096-2.437)	.378
Maximum occlusal force	0.996(0.991-1.002)	.175

OR, odds ratio; CI, 95% confidence interval, *$p < .05$, **$p < .01$, ***$p < .001$
Note. Factors with $p < .05$ in the bivariate analysis were used in the model as independent variables.

Table 1. Myophysiological characteristics related to swallowing function according to the risk of sarcopenic dysphagia

	Total (n=113) M±SD	No (n=59) M±SD	Possible (n=25) M±SD	Probable (n= 29) M±SD	F	p
Strength (kPa)						
Tongue	25.81±9.47	32.10±8.40a	22.88±2.44b	15.52±2.60c	69.91	.000***
Buccinator	19.98±4.84	22.12±3.53a	19.28±4.39b	16.24±5.16c	19.59	.000***
Lip	15.72±4.98	20.83±3.52a	17.84±4.24b	15.72±4.98b	16.12	.000***
Muscle thickness (mm)						
Tongue	28.41±9.52	34.66±8.21a	25.24±3.85b	18.41±3.86c	63.95	.000***
Masseter; rest	8.17±1.08	8.23±0.89	8.55±1.43a	7.70±0.93b	4.68	.011*
Masseter; contraction	9.67±1.46	9.75±1.35	10.07±1.75a	9.11±1.25b	3.22	.044*
Maximum occlusal force (N)	469.82±173.42	514.56±154.54a	447.08±173.14	398.41±187.53b	4.97	.009**

M: Mean, SD: Standard deviation, *$p < .05$, **$p < .01$, ***$p < .001$
Note., Means not sharing subscript differ significantly at a=.05 as indicated by Post hoc Scheffe's tset

Table 2. Swallowing and oral health related characteristics according to the risk of sarcopenic dysphagia

	Total (n=113) n (%) or M±SD (Range)	No (n=59) n (%) or M±SD (Range)	Possible (n=25) n (%) or M±SD (Range)	Probable (n=29) n (%) or M±SD (Range)	F/ x2	p
EAT-10	8.50±7.01	6.36±4.62a	8.96±7.66	12.38±8.72b	8.10	.001**
KOHIP-14	26.09±11.0	19.81±7.31a	30.76±8.82b	34.83±11.32b	32.68	.000***
Oral mucosal moisture level	24.77±2.97	26.42±2.40a	23.08±2.64b	22.86±2.28b	28.82	.000***
No. of teeth lost	3.04±1.62 (0-8)	2.90±1.46(1-8)	2.88±1.85(0-7)	3.48±1.68(1-8)	1.447	.240
Denture use						
Yes	41(36.3)	21(35.6)	10(40.0)	10(34.5)	.202	.904
No	72(63.7)	38(64.4)	15(60.0)	19(65.5)		

KOHIP-14: Korean oral health impact profile-14, M: Mean, SD: Standard deviation, *$p < .05$, **$p < .01$, ***$p < .001$
Note: Means not sharing subscript differ significantly at a=.05 as indicated by Post hoc Scheffe's tset