



Reply to Wakabayashi Regarding “Sarcopenia is an Independent Risk Factor for Dysphagia in Community-Dwelling Older Adults”

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This is a reply to the letter by Wakabayashi who raised important points regarding our article on sarcopenic dysphagia [1]. Considering that sarcopenia is suggested as an important risk factor for dysphagia, it is a great pleasure that the validated diagnostic algorithm for sarcopenic dysphagia is available [2]. Actually, our study design was consistent with the algorithm. Our study cohort included adults who were 65 years and older [3], and hand-grip strength, walking ability, and general muscle mass, which were suggested in the algorithm, were measured. Swallowing function was evaluated using the Standardized Swallowing Assessment. Those with obvious causative disease of dysphagia were excluded. However, we acknowledge that we did not measure swallowing muscle strength; therefore, possible and probable sarcopenic dysphagia could not be distinguished. Currently, tongue pressure measurement is not widely used, except for Japan. Moreover, determining a cutoff value of the measurement is also difficult problem [2]. Thus, further studies on normative data of tongue pressure are warranted.

As Wakabayashi mentioned, sarcopenia could contribute to dysphagia or aggravation of dysphagia even in patients with common causes of dysphagia (e.g., stroke) [4]. However, we thought that investigating the contribution of sarcopenia among patients with common causes of dysphagia is not possible in our cross-sectional study design. Further studies with detailed information for a specific disease and dysphagia (e.g., stroke location and onset of dysphagia) and a longitudinal study would be required. We did not consider variables related to malnutrition, such as body mass index (BMI), as a confounder for dysphagia in our initial analysis. The Global Leadership Initiative on

Malnutrition criteria included non-volitional weight loss, low BMI, reduced muscle mass, reduced food intake, and disease burden/inflammation for the diagnosis of malnutrition [5]. C-reactive protein (CRP) and albumin were suggested as proxy measures of inflammation. Therefore, we additionally performed an analysis including BMI and CRP. No significant statistical differences between the dysphagia and non-dysphagia groups were found for BMI (24.08 in dysphagia group vs. 24.11 in non-dysphagia group, $p=0.970$) and CRP (0.41 in dysphagia group vs. 0.18 in non-dysphagia group, $p=0.213$). In a logistic regression analysis including these variables, sarcopenia was still an independent risk factor for dysphagia (odds ratio, 2.693 [95% confidence interval, 1.125–6.441], $p=0.026$).

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Cha S, Kim WS, Kim KW, Han JW, Jang HC, Lim S, et al. Sarcopenia is an independent risk factor for dysphagia in community-dwelling older adults. *Dysphagia*. 2019;20:19. <https://doi.org/10.1007/s00455-018-09973-6>.
2. Mori T, Fujishima I, Wakabayashi H, Itoda M, Kunieda K, Kayashita J, et al. Development, reliability, and validity of a diagnostic algorithm for sarcopenic dysphagia. *JCSM Clin Rep*. 2017;2(2):e00017.
3. Park JH, Lim J. An overview of the Korean longitudinal study on health and aging. *Mov Disord*. 2007;4(2):84–95.
4. Sporns PB, Muhle P, Hanning U, Suntrup-Krueger S, Schwindt W, Eversmann J, et al. Atrophy of swallowing muscles is associated with severity of dysphagia and age in patients with acute stroke. *J Am Med Dir Assoc*. 2017;18(7):635.e1–7.

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5. Cederholm T, Jensen GL, Correia MITD, Gonzalez MC, Fukushima R, Higashiguchi T, et al. GLIM criteria for the diagnosis of malnutrition—a consensus report from the global clinical nutrition community. *Clin Nutr.* 2019;38(1):1–9.

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