Letter: The Differential Association between Muscle Strength and Diabetes Mellitus According to the Presence or Absence of Obesity (J Obes Metab Syndr 2019;28:46-52)

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Recent consensus reports are emphasizing that reduced muscle strength (dynapenia) and poor physical performance are key diagnostic criteria of sarcopenia, as much as loss of muscle mass is, although definitions vary.^{1,2} Aging is a universal cause of decreased muscle mass and strength. However, in addition to aging, many chronic diseases including diabetes mellitus (DM) can accelerate loss of muscle mass and strength. Dynapenia was found to be associated with an increased risk of all-cause and cardiovascular mortality in many studies^{3,4} but somewhat controversial in a prospective study of diabetics.⁴

In the issue of the *Journal of Obesity & Metabolic Syndrome*, Koo⁵ analyzed the association between DM and absolute handgrip strength in Korean adults aged 30–79 years. Low handgrip strength was associated with the presence of DM only in nonobese subjects. The author⁵ used absolute handgrip strength in contrast to the use of relative (body mass index [BMI]- or weight-normalized) handgrip strength used in some previous reports⁶ and performed obesity-stratified analyses instead. There are no standardized indices for the definition of low muscle strength. Using absolute handgrip strength for this analysis could be a useful alternative. However, I

have some concerns about the results showing differences between obese and nonobese subjects and additional points that need further clarification.

First, comparative data are needed to confirm that the characteristics of obese and nonobese people were similar. A longer duration of diabetes and higher concentrations of glucose and insulin are associated with accelerated muscle loss⁷ and disability.⁸ If nonobese DM subjects had more severe hyperglycemia than obese DM subjects, a more pronounced association with DM could be seen in nonobese subjects. In addition to the severity of DM, insufficient protein intake could also be an important factor. Second, to confirm the results, a stratified analysis of obesity based on a non-BMI basis (e.g., body fat percent, waist circumference, etc.) would be useful. In addition, the percentage of blue-collar workers and socioeconomic status distribution could be considered confounding.

Nevertheless, this study added another piece of evidence to our understanding of the relationship between low muscle strength and DM using a nationally representative sample of adults in Korea. Low muscle mass increases the risk of developing type 2 DM in Koreans.⁹ Future prospective studies will be needed to assess the

effects of body components, including muscle mass and fat deposition, and changes in the quality and function of muscles on the occurrence of DM and the development of diabetic complications.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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