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Impact of gait speed on the obesity paradox in elderly patients with cardiovascular disease

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Introduction: Overweight and obese patients demonstrate better prognosis following cardiovascular disease (CVD) development, a phenomenon known as the "obesity paradox." However, high body mass index (BMI) is an additional risk factor for both disability and falls; therefore, high BMI does not essentially have a protective effect against health disorders in elderly people with reduced physical function. However, it is unclear whether the obesity paradox exists in elderly patients with CVD with reduced physical function, such as slow gait speed.

Purpose: To determine whether gait speed affects the obesity paradox in elderly patients with CVD.

Methods: The study population comprised 2,224 patients aged ≥60 years with CVD who were hospitalized between May 1, 2006, and January 31, 2018. BMI and gait speed before hospital discharge were determined, and patients were divided into slow and preserved gait speed (=0.8 and >0.8 m/s, respectively) groups according to the algorithm for sarcopenia diagnosis. The two groups were further subdivided according to Asian-specific BMI categories recommended by the World Health Organization as follows: BMI<18.5 kg/m², BMI 18.5–23.0 kg/m², and BMI=23.0 kg/m². The study endpoint was all-cause mortality.

Results: The study population (male: 66.7%) had a mean age of 73.1 ± 7.6 years. Over a median follow-up period of 1.69 years (interquartile range: 0.67–3.67 years), 283 patients died. Higher BMI was associated with favorable prognosis in the preserved gait speed group but not in the slow gait speed group after adjusting for other prognostic factors. Adding BMI to the clinical model significantly increased the area under the receiver operating characteristic curve (AUC) (0.733 vs. 0.713, P=0.04), continuous net reclassification improvement (cNRI, 0.291; P<0.001), and integrated discrimination improvement (IDI, 0.014; P<0.001) for all-cause mortality in the preserved gait speed group. However, the addition of BMI to the clinical model did not improve the AUC (0.684 vs. 0.684, P=0.99), cNRI (-0.085; P=0.45), and IDI (0.0001; P=0.94) in the slow gait speed group.

Conclusion: Higher BMI was consistently associated with favorable prognosis in patients with CVD with preserved gait speed but not in those with slow gait speed. These findings indicated that physical frailty influences the obesity paradox in elderly patients with CVD.
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