Editorial

Obesity in the Sarcopenia Era

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With the coining of the term “sarcopenia,” lean body mass has been a major focus of aging research for the past 25 years. The motivating idea is that weakness, a hallmark of physical disability, is determined by skeletal muscle mass. Therefore, a logical strategy to prevent disability would be to slow or reverse age-related decreases in muscle mass (1). However, evidence shows that the situation is more nuanced than originally expected. In community-dwelling older adults, the linkage between lean mass and strength is not especially strong, and some interventions that are effective in increasing lean mass do not appear to affect strength (2,3). Furthermore, intentional weight loss in obese older adults does not necessarily reduce muscle strength, despite significant reductions in muscle mass (4). In contrast to what might be predicted by the sarcopenia hypothesis, there have been five moderate to large clinical trials showing that weight loss improves physical performance and that this effect is additive to the benefits of exercise (5–9). Furthermore, the degree of functional improvement is correlated with the extent of adipose tissue loss (10). The benefits of physical activity seem to be blunted in obese older adults (11), and high levels of adiposity accelerate aging-related loss of lean mass (12). Concerns that intentional weight loss might predispose overweight or obese older persons to a higher mortality risk appear unwarranted (13).

Excess adipose tissue and obesity have emerged as strong contributors to physical limitation and functional decline (14). In the Framingham Study, for example, Visser et al. (15) found that those in the highest tertile of fat mass were more than 160% more likely to have self-reported disability compared with those in the bottom tertile. There was no association between disability and lean mass. Adiposity and obesity lead to disability through both direct and indirect pathways. From a biomechanical perspective, obesity increases the effort required to move for given strength; it also alters the gait mechanics impairing walking efficiency (16,17). Obesity is a strong contributor to the most prevalent disabling health conditions—osteoarthritis, heart disease, diabetes, and stroke, and is a strong driver of multimorbidity (18). Obesity is associated with high levels of circulating inflammatory cytokines (eg, interleukin-6 and c-reactive protein), which predict functional decline in older adults (19). With aging, there is a tendency to deposit fat in and around organs. Specific functional and metabolic derangements have been seen with fat deposited in and around skeletal muscle, the heart, and the liver (20–22). Although this deposition is higher in obese individuals, the organ-specific associations are largely independent of whole body measures of obesity.

This issue of the Journal presents several articles on obesity and related health outcomes to focus attention on this important area. These articles report data from the United States, France, Finland, and Iceland showing the impact of obesity on the longevity of older black Americans (23); the long-term functional impact of midlife obesity on frailty in old age (24); the impact of metabolic syndrome, a major obesity-related health condition, on incident mobility and instrumental activities of daily living limitation (25); and the age-dependent nature of the relationship between body mass index and cardiovascular disease and its risk factors (26). Three papers substantially advance the conversation on body composition and health and function. Tseng et al. (27) present data showing that body composition measures help explain gender differences in physical performance between older men and women. Manini et al. (28) present data from a trial of caloric restriction with exercise showing that the extent of reductions in both intramuscular and subcutaneous calf fat were correlated with increased walking speed. Finally, the report from Murphy et al. (29) points to a new research direction by linking the density of fat as assessed by CT to mortality risk. The paper includes data from nonhuman primates that explore the possible mechanistic basis for this novel finding. Denser fat is associated with small adipocyte
size, and lower leptin and higher adiponectin expression in fat cells. It is not, however, associated with inflammation at either the adipose tissue or the systemic level, suggesting there are additional health biomarkers linked to adipose tissue still to be elucidated.

In the United States, 40.8% of 65- to 74-year-olds and 27.8% of those 75+ are obese, making it more common than sarcopenia in community-dwelling older adults (30). Given obesity’s high prevalence in older adults, and its strong association with functional impairment, it deserves the focused attention of medical gerontology.

References