Balancing Weight Loss and Sarcopenia in Elderly Patients With Peripheral Artery Disease

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The estimated prevalence of peripheral artery disease (PAD) in the United States is between 8 and 12 million.[1,2] PAD is associated with a 3- to 6-fold increase in cardiovascular morbidity and mortality risk.[3] Although only one third of affected patients have typical claudication symptoms at the time of diagnosis, up to 20% undergo an amputation within 10 years.[1,3-5] Individuals with PAD have higher risk for functional decline and impaired health-related quality of life (HRQOL) secondary to their ambulatory limitations. Even among patients traditionally labeled as having "asymptomatic PAD," exertional leg symptoms often exist and limit functional status and HRQOL. Functional status in PAD can be assessed with objective measures such as treadmill testing, 6-minute walk distance (6MWD), and the Short Physical Performance Battery.[6] However, these objective measures do not address a patient's perception of ambulatory status or HRQOL, for which questionnaires are needed. Such questionnaires focus either on walking ability and its relationship with HRQOL, or they are broader with the goal of addressing a patient's overall well-being and life satisfaction.[7]

In this issue of the *Journal of the American Heart Association (JAHA)*, Polonsky et al studied the association between weight changes and changes in calf muscle characteristics, knee strength, and walking ability in patients with PAD.[8] For this purpose they retrospectively identified 389 (mean age 74.5±7.8) participants from the WALCS II (Walking and Leg Circulation Study II) with a mean follow-up of 3.23±1.37 years. In total, 42.2% of the patients were overweight, and 30.8% obese. Walking ability was assessed with an annual 6-minute walk test, and calf muscle characteristics were examined with computed tomography at baseline and at 2- and 4-year follow-up. After asking patients about weight changes, the investigators confirmed their responses with actual measurements. Weight change (loss or gain) was defined as a ≥5-lb change compared to the previous year's visit. Patients' self-report of weight loss (≥5 lb) was confirmed by measurements in roughly half of the person-years (52%). Patients who had lost weight but did not self-report weight loss were classified as having had unintentional weight loss. This allowed for creation of 4 groups for longitudinal analysis: stable weight; weight gain; intentional weight loss; and unintentional weight loss. Patients who experienced both weight gain and loss in different annual follow-up visits were excluded from the longitudinal analysis.

The authors found that intentional weight loss was associated with significantly less decline in the annual 6MWD compared to unintentional weight loss (intentional +3.7±18.2 m versus −20.8±10.45 m for unintentional weight loss; P=0.022) or weight gain (intentional +3.7±18.2 m versus weight loss −28.5±9.35; P=0.003), as well as numerically less decline compared to patients with stable weight (−14.0±4.3, P=0.067). Intentional weight loss was also associated with a greater reduction in calf muscle area compared to the stable-weight or weight-gain groups (P<0.001). There were no associated differences between the intentional weight-loss group and the other groups for other examined functional outcomes (isometric knee-extension strength and knee-extension power). Apart from weight change, other variables associated with the annual change in the 6MWD were the previous year's 6MWD, age, male gender, smoking, and body mass index.

In summary, the authors discovered that intentional weight loss was associated with improved functional capacity as measured by 6MWD. However, there was a potential trade-off,

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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J Am Heart Assoc. 2019;8:e013200. DOI: 10.1161/JAHA.119.013200.

as these same patients actually lost greater amounts of calf muscle mass over time than patients with stable weight or weight gain as measured by computed tomography. These findings should be viewed in their context. First, the authors used a resampling analysis strategy in order to deal with patients who changed from having weight loss or weight gain to stable weight in their annual visits. Analyzing the data with person-years was probably the wisest option given the annual visits and weight measurements, but it also had the effect of camouflaging the modest number of patients in each group. The most important findings related to the intentional-weight-loss group, but analyses regarding this group contained data on only 19 to 43 person-years. Thus, it is likely that the difference observed in the 6MWD was largely driven by only a few patients. Also, only outcomes that can be examined with objective measures were used for the longitudinal analysis. Questionnaires about HRQOL may be equally effective ways to monitor functional status while also providing important data regarding patients' perception of their health and well-being.[7]

How should the findings of this study change the practice of physicians involved in PAD care? The current study raises some important questions about the safety of intentional weight loss, specifically in elderly PAD patients. Weight-reduction strategies in overweight or obese nonelderly patients with PAD reduce overall cardiovascular risk while they also improve functional outcomes and HRQOL.[9] But how does weight reduction affect the elderly, in whom the linkage between weight loss and sarcopenia can be a major issue? Sarcopenia, defined as the loss of lean muscle mass with aging, is especially prevalent in elderly individuals who experience unintentional weight loss. Patients with sarcopenia can be further stratified to sarcopenic-lean and sarcopenic-obese.[10] There is major overlap in terms of etiology, symptoms, negative outcomes, and overall prognosis between sarcopenia and frailty.[11-14] Frailty is defined as the syndrome of physiological decline in late life that is associated with increased vulnerability to adverse health outcomes. Frail patients have a higher risk for falls, hospitalizations, worse outcomes after percutaneous procedures or surgeries, disability, and death.[15] Unintentional weight loss is included in frailty risk scores as an independent predictor of frailty, but weight loss—even when intentional—is also a risk factor for other frailty score components such as weakness, exhaustion, and sarcopenia.

So should fear of sarcopenia and frailty lead us to alter our recommendations regarding weight loss to elderly patients with PAD? Randomized clinical trials (although not in the PAD population) in elderly patients with obesity have shown that weight loss is not associated with negative outcomes and can even decrease mortality when achieved through careful dietary instructions (adequate intake of protein of high biological quality, calcium, vitamin D) and carefully structured physical activity interventions.[16-18] It is certainly possible that not all weight-loss strategies are created equal.

Similar to other difficult-to-answer questions in contemporary clinical medicine, the dilemma of balancing weight loss and the risk for sarcopenia/frailty has complicated answers. Given the absence of any risk scores that can weigh risk and benefits, each patient's treatment strategy should be assessed individually. Involvement of a multidisciplinary group of providers including primary care physicians, cardiologists, endocrinologists, interventionalists, dieticians, nutritionists, and physiotherapists can likely achieve the best outcomes by emphasizing an early focus on weight reduction without compromising an elderly patient's muscle mass, bone health, and overall HRQOL. Cardiologists are familiar with the "heart team" concept that was built in order to achieve the best outcomes for coronary and structural heart disease, and recently there has been considerably greater emphasis on multidisciplinary care for patients with critical limb ischemia.[19] Contrary to the previously mentioned dilemmas, this last question probably has an easy answer: why should we wait for PAD patients to reach the critical limb ischemia stage before we manage their disease with a more holistic and multidisciplinary approach?

Disclosures

Dr Armstrong is a consultant to Abbott Vascular, Boston Scientific, Cardiovascular Systems, Gore, Intact Vascular, Janssen, Medtronic, and Philips. Dr Giri has served on advisory boards for AstraZeneca and has received research funds to his Institution from Recor Medical and St. Jude Medical. Dr Kokkinidis has no disclosures to report.

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Key Words: Editorials • exercise • obesity • peripheral artery disease