Left Ventricular Mass and Parameters of Body Composition in Older Adults

To the Editor: A progressive decrease in lean body mass (LBM) and an increase in fat mass (FM) occur with age. The concomitant change in left ventricular mass (LVM) is an independent predictor of cardiovascular morbidity/mortality, but its association with age-related changes in body composition has been scarcely addressed. The LVM increases with age, similar to the prevalence of arterial hypertension (AH) and diabetes mellitus (DM), as shown by echocardiographic studies on individuals with a wide age range.[1-4] This approach highlights age-related changes, but not if they are prolonged in older life.

We investigated body mass index (BMI), FM, LBM, appendicular lean mass of the limbs (ALM), and total body bone mass (TBBM) compared with LVM in 228 (98 men and 130 women) consecutive free-living individuals 65 to 91 years old, together with the respective possible influence of BMI, AH, and DM. In all the participants, also grouped as those with or without low skeletal muscle mass (LSMM) according to European Working Group on Sarcopenia in Older People criteria,[5] BMI was calculated as the weight in kilograms divided by the height in meters squared. Total-body dual-energy X-ray absorptiometry was used to measure FM, LBM, TBBM, ALM, and the skeletal muscle index (SMI=ALM/h^2). Both LVM and LVM indexed for height$^{2.7}$ ($LVM_{adj\text{-}h^{2.7}}$) were calculated using the Devereux formula,[6] based on echocardiographic parameters (MyLab X8, 1- to 5-MHz probe; Esaote). All the participants gave informed consent, and the study was approved by the local ethics committee of 'Casa Sollievo della Sofferenza' Hospital, IRCCS.

Values were compared using parametric or nonparametric tests, as appropriate. Correlations were tested using the Spearman rank test and partial correlation coefficients adjusting for BMI and AH or DM. The possible interaction of either AH or DM with FM, LBM, ALM, SMI, and TBBM when influencing LVM was tested by a general linear model controlled for age for each covariate.

Both BMI and FM were higher in women, whereas LBM, ALM, SMI, TBBM, and LVM were higher in men (Table). Men and women with LSMM had lower mean ± SD LVM (men: 216.3±73.1 g vs 242.2±66.1 g; P=.024; women: 155.6±35.6 g vs 201.9±52.0 g; P<.001) and $LVM_{adj\text{-}h^{2.7}}$ (men: 53.6±20.5 g vs 62.8±16.6 g; P=.001; women: 48.6±12.6 g vs 61.4±16.8 g; P=.003) than those without LSMM. In the whole sample, LVM positively correlated with BMI, FM, LBM, ALM, SMI, and TBBM (r=0.15-0.38; P=.025 to <.001), whereas age negatively correlated with BMI, FM, LBM, ALM, SMI, and TBBM (r=−0.15 to 0.24; P=.021 to <.001) but not with LVM or $LVM_{adj\text{-}h^{2.7}}$. Partial correlation analysis controlling for BMI, AH, BMI+AH, DM, or BMI+DM showed that significant correlation persisted between LVM and LBM (r=0.31-0.39; P<.001), ALM (r=0.27-0.37; P<.001), SMI (r=0.27-0.36; P<.001), and TBBM (r=0.33-0.35; P<.001). As expected, LBM, ALM, SMI, and TBBM significantly correlated with each other (r=0.50-0.92; P<.001) even after these adjustments. The interaction analysis showed that DM negatively interacted on the correlations between LVM and LBM (P=.025) and between $LVM_{adj\text{-}h^{2.7}}$ and TBBM (P=.049); DM interaction on the correlations between LVM and SMI and between LVM and TBBM approached significance (P<.10 to >.05).

Progressive changes in body composition occur with aging, with an increase in FM and a decrease in LBM and skeletal muscle mass due to the progressive loss of muscle fibers. Although dual-energy X-ray absorptiometry cannot catch the infiltration of fat and collagen within tissue, it is considered the gold standard to measure skeletal muscle and its age-related loss and the concomitant decline of bone mass in clinical studies. According to the present data, this extensively investigated[7,8] association persists into older age. In the present free-living older adults, we compared LVM with body size (expressed as BMI), FM, LBM, skeletal muscle mass (measured as absolute ALM and SMI), and TBBM. We found that individuals with LSMM had lower LVM than those without LSMM, as found in Asian people through bioimpedance analysis.[9] We also found that ventricular mass highly significantly correlated with fat and lean mass, as with skeletal muscle mass and bone mass. These correlations persisted highly significantly after adjusting for BMI, which suggests that they did not merely depend on body size. The present results seem to support the speculation that the specific age-related degenerative phenotypes of heart, muscle, and bone may result from a framework of partially shared pathways, leading to the loss of functional mass.[10]

Mayo Clin Proc. ■ March 2022;97(3):626-629
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TABLE. Descriptive Statistics of the Main Parameters Investigated in the Whole Sample and in Male and Female Participants

Parameter	Whole sample (N=228)	Men (n=98)	Women (n=130)	*P* value[a]
Age (y), mean ± SD	75.61±6.28	76.13±6.15	75.22±6.34	.320
Alcohol, Y/N (No.)	26/202	22/76	2/128	.001[b]
Smoke, Y/N (No.)	70/158	22/76	10/120	.002[b]
Diabetes mellitus, Y/N (No.)	114/114	46/52	68/62	.422
Arterial hypertension, Y/N, No.	185/43	73/25	112/18	.024[b]
Weight (kg), mean ± SD	73.78±16.82	76.16±16.15	71.99±17.15	.045[b]
Height (m), mean ± SD	1.60±0.08	1.66±0.07	1.56±0.06	<.001[b]
BMI, mean ± SD	28.78±6.29	27.57±5.68	29.69±6.59	.011[b]
FM (kg), mean ± SD	28.6±11.8	24.9±11.3	31.5±11.4	<.001[b]
LBM (kg), mean ± SD	42.7±8.5	48.3±7.2	38.5±6.8	<.001[b]
ALM (kg), mean ± SD	18.5±4.4	21.1±4.3	16.5±3.5	<.001[b]
SMI, mean ± SD	7.13±1.36	7.57±1.34	6.81±1.29	<.001[b]
TBBM (kg), mean ± SD	2.3±0.5	2.7±0.4	1.9±0.3	<.001[b]
LVM (g), mean ± SD	211.5±63.0	232.4±69.6	195.8±52.4	<.001[b]
$LVM_{adj\text{-}h^{2.7}}$ (g), mean ± SD	59.6 ±17.6	59.3±18.6	59. 8±16.9	.597

[a]*P* values refer to differences between male and female participants, tested by *t* test or Mann-Whitney test and by χ^2 or Fisher exact test, as appropriate.
[b]Statistically significant.
ALM, appendicular lean mass of the limbs; BMI, body mass index; FM, fat mass; LBM, lean body mass; LVM, left ventricular mass; $LVM_{adj\text{-}h^{2.7}}$, left ventricular mass adjusted for height$^{2.7}$; SMI, skeletal muscle index (ALM adjusted for height in meters squared); TBBM, total body bone mass; Y/N, yes/no.

Considering the respective significant associations, one would expect that ventricular mass negatively correlates with age, similar to lean muscle and bone mass. Instead, we did not find a significant correlation between age and LVM. We also tested for possible interactions of available risk factors, such as obesity (BMI), AH, and DM, whose prevalence increases with age. According to previous results,[1-9] DM exerted a significant negative interaction on the correlation of absolute/indexed LVM with both LBM and TBBM, with the negative interaction also approaching significance on the correlations of LVM with SMI and TBBM (P<.10 to >.05).

In conclusion, these results show that ventricular mass in older adults significantly correlates with parameters of body composition, which decline with age. Diabetes mellitus exerts a relevant negative interacting influence on the association between age and ventricular mass.

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Potential Competing Interests: The authors report no competing interests.

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https://doi.org/10.1016/j.mayocp.2022.01.001

Employer-Provided Professional Coaching to Improve Self-compassion and Burnout in Physicians

To the Editor: Occupational burnout is a highly prevalent manifestation of work-related distress among physicians, with important personal and professional consequences.[1] Several recent studies have suggested that professional coaching is one strategy to help individual physicians navigate personal and professional challenges and reduce occupational burnout.[2,3] Other studies report that although physicians have higher levels of personal resilience than US workers in other fields,[4] they often have perfectionistic tendencies and low self-valuation levels.[5] Self-valuation includes responding to personal imperfections with a growth mindset (ie, learn and improve rather than self-condemnation) and prioritizing self-care amid competing time demands.[6] Low self-valuation appears to be an "Achilles heel" for physicians and contributes to burnout and other forms of occupational distress.[6] Sleep-related impairment has also been shown to be prevalent among physicians and to contribute to burnout and medical errors. The ability of professional coaching to help physicians make progress, the number of coaching sessions needed to improve work-related distress, and the applicability of coaching outside of clinical trials are not yet defined.

In 2018, we developed a coaching program as a standard benefit for clinicians at Stanford Medicine. This program was designed on the basis of previous reports of the effectiveness of coaching in physicians.[2] Coaching sessions with a board-certified coach were provided at no charge or heavily subsidized (80% of cost covered) for Stanford physicians based on whether they did or did not have employer-provided educational funds. Participants were allowed to choose either 4 or 6 coaching sessions at the time of enrollment. Burnout, sleep-related impairment, and self-valuation were evaluated using standardized instruments[5] before the start of the program. Post-coaching assessment of the same domains was performed at the end of the coaching sessions. Among the first 62 physicians who registered for the program, 57 (91.9%) completed the coaching sessions, of whom 46 (80.7%) completed both the baseline and post-coaching assessments.

The baseline and post-coaching assessment scores in each domain for the 46 participants completing pre/post coaching surveys are shown in the Table. Large and statistically significant effect size improvements (all >0.6) were observed in burnout, sleep-related impairment, and self-valuation. The magnitude of improvement in scores for individuals completing 4 and 6 coaching sessions appeared relatively similar (Table).

We report here preliminary evidence on the benefits of professional coaching offered to physicians as an employer-provided benefit. The results suggest that professional coaching is an effective strategy not only to reduce occupational burnout but also to address the low self-valuation frequently observed in physicians.[5] In this "real-world" observational experience, 4 coaching sessions resulted in a statistically significant improvement in burnout and sleep-related impairment, and we did not find statistically significant differences in outcome measures between 4 and 6 coaching sessions. This comparison should be interpreted with caution, given the small sample size. Further studies are needed to determine the optimal number of coaching sessions, which may vary by individual.

These findings add to the existing literature on the benefits of professional coaching in physicians

TABLE. Baseline and Post-Coaching Assessment Scores for the First 46 Participants Who Completed Pre/Post Coaching Surveys

Baseline and post-coaching scores for all participants				
Measure	Pre, mean (±SE)	Post, mean (±SE)	*P* value	Effect size (Cohen's d)
Burnout[a]	3.26 (0.30)	2.33 (0.27)	<.0001	−0.69
Self-valuation[b]	4.16 (0.26)	5.76 (0.26)	<.0001	0.84
Sleep-related impairment[a]	3.51 (0.30)	2.49 (0.26)	<.0001	−0.64

Comparisons between 4 and 6 sessions			
	4-session change from baseline (n=16), mean ± SE	6-session change from baseline (n=30), mean ± SE	*P* value
Burnout[a]	−0.78±0.29	−1.01±0.27	.588
Self-valuation[b]	1.13±0.57	1.85±0.30	.227
Sleep-related impairment[a]	−1.23±0.32	−0.92±0.32	.530

[a]Scale of 0 to 10; higher scores unfavorable.
[b]Scale of 0 to 10; higher scores favorable.