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Sarcopenic obesity and associated body composition characteristics in individuals undergoing bariatric surgery: a retrospective study

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Abstract:

Background and aims: Sarcopenia can coexist with obesity, together termed sarcopenic obesity (SO). SO is characterised by concomitant low muscle mass and function and excessive fat accumulation. As different relative indices of body composition are used to define SO, data on the prevalence of SO are divergent. This retrospective study aims to examine the prevalence of SO and its associations with pre-operative body composition characteristics, metabolic profile and weight loss success in bariatric surgery candidates.

Materials and methods: Retrospective, cross-sectional study evaluating whole-body and regional body composition (assessed by dual-energy x-ray absorptiometry) and biochemical blood variables in adults (age 42±13 years) planned for bariatric surgery (n=78, 23% male, BMI 41.2±3.2 kg/m²). SO diagnosis was based on sex-specific cut points for relative expressions of appendicular lean tissue mass (ALM, corrected for total body weight (ALM/w) or height squared (ALM/h²)), as advocated by the Sarcopenic Obesity Global Leadership Initiative. Body composition variables, metabolic profile and weight loss (expressed as percentage total weight loss following surgery) were compared between ALM tertiles using Kruskal-Wallis and Mann-Whitney U tests.

Results: In the current cohort, the prevalence of SO ranged from 0% (based on ALM/h²) to 91% (based on ALM/w). ALM tertiles showed similar BMI and fat distribution variables (Table 1, p>0.05), metabolic blood variables related to lipid profile (i.e. total, HDL-, LDL-cholesterol), glucose homeostasis (i.e. fasting glucose, fasting insulin), renal function (i.e. creatinine, urea) and liver enzymes (p>0.05). Bariatric surgery induced similar weight loss trajectories between ALM tertiles, on average resulting in 26±6% and 33±8% total weight loss after 6 and 12 months, respectively.

Conclusion: In adult candidates for bariatric surgery, the prevalence of SO is strongly dependent on the diagnostic criteria used, which urges for continuing the quest to find a proper composite criterion for individuals with obesity. No significant differences were found in the metabolic profile among the ALM tertiles. Further research will be necessary to confirm whether SO and lean tissue related variables are associated with metabolic health in individuals with morbid obesity.

Table 1	ALM tertile 1	ALM tertile 2	ALM tertile 3	p-value
BMI (kg/m ²)	40.9 ± 3.0	40.5 ± 2.6	40.8 ± 3.5	0.871
Waist circumference (cm)	127 ± 8	123 ± 10	126 ± 10	0.680
Whole body fat (%)	51.7 ± 5.5	51.2 ± 4.5	49.2 ± 6.2	0.174
Whole body fat mass (kg)	53.2 ± 6.3	56.2 ± 5.7	57.9 ± 9.9	0.067
Trunk fat (%)	54.6 ± 4.3	54.5 ± 3.3	51.8 ± 4.7	0.076
Android fat (%)	59.3 ± 5.1	58.9 ± 3.8	56.6 ± 4.9	0.156
Gynoid fat (%)	51.1 ± 8.0	51.5 ± 6.6	51.3 ± 7.5	0.994
ALM (kg)	21.1 ± 3.9	24.3 ± 4.4	28.5 ± 6.5	<0.001
Whole body fat-free mass (kg)	49.8 ± 8.2	53.8 ± 9.1	60.2 ± 14.4	<0.001

Data are shown as means ± SD. ALM, appendicular lean tissue mass; BMI, body mass index; TWL, total weight loss

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