Gender-related changes in body composition, muscle strength and power output after a short-term multidisciplinary weight loss intervention in morbid obesity

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Obese men and women have notably different body composition, which contributes to a different functional motor impairment, but it is unknown whether they respond differently to the same intervention for body weight (BW) reduction and motor capability improvement. The aim of this investigation was to compare changes in body composition, strength production and power output observed in severely obese men and women after a BW reduction intervention, and to test the hypothesis that changes in body composition may be related to changes in motor functionality. Ninety-five obese men and women of the same age (29.3±7.0 SD yr) and body mass index (41.2±4.4 kg/m^2) participated in a short-term (3 week) mass reduction program (5 days/week) entailing exercise (aerobic and strength training) and energy-restricted diet. BW and body composition, maximum voluntary total isotonic strength (S_T), and maximum leg power output ($\dot{W}$) were evaluated before and after the program. After the intervention, BW decreased significantly in both men and women, but males lost a significantly higher amount of their initial BW than females (5.12±0.91 *vs* 4.27±1.42%, $p<0.01$). In men the BW loss was composed by a similar amount of fat mass (FM) and fat-free mass (FFM), whereas women lost FM almost entirely. Both men and women significantly improved S_T after the intervention, but no difference in improvement was detected between genders, while $\dot{W}$ increased significantly in females ($p<0.001$), and no change was detected in males, although $\dot{W}$ per unit BW and FFM increased significantly in both genders ($p<0.05$-0.001). In spite of the positive correlation of the S_T and $\dot{W}$ with FFM ($p<0.001$), there was no detectable relation between the changes in body composition and those in motor performance, the improvement in S_T and $\dot{W}$ being better attributable to factors other than muscle mass change. The present diet/exercise intervention induced significant effects on BW changes and composition as well as on S_T and $\dot{W}$, with a different impact in males and females.