

## **Obesity-associated poor muscle quality: prevalence and association with age, sex, and body mass index.**

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Background: Muscle quality (i.e., the expression of muscle function per unit of muscle mass) has been proposed as a clinically-relevant measure to detect individuals at risk of functional incapacity. Individuals with obesity might be at an increased risk of having poor muscle quality. Thus, we aimed to analyze the prevalence of poor muscle quality in obese individuals, to determine associated variables, and to provide normative values for this population.

Methods: 203 individuals with obesity (103 women, age: 18-75 years, body mass index (BMI): 35-64 kg·m<sup>-2</sup>) participated in this cross-sectional study. Their muscle strength (handgrip dynamometry), muscle power (sit-to-stand test) and muscle mass (bioelectrical impedance analysis) were measured, and muscle quality (strength/power to muscle mass ratio) was compared with reference values obtained in young healthy individuals. Muscle quality was individually categorized as normal, low or poor based on specific muscle strength and power (i.e., strength and power per unit of muscle mass, respectively). Sex and age-specific normative values of specific muscle strength and power were computed for the whole cohort.

Results: Age and being a woman were inversely associated with specific muscle strength, with age being also inversely associated with specific muscle power. A small proportion of participants (6%) presented with an impaired (i.e., low/poor) specific muscle power while most of them (96%) had impaired specific muscle strength. Eventually, 84% of the participants were deemed to have poor muscle quality. Being a woman (odds ratio [OR]: 18.09, 95% confidence intervals [CI]: 4.07-80.38), age (OR: 1.06, 95%CI: 1.03-1.10) and BMI (OR: 1.22, 95%CI: 1.07-1.38) were independently associated with a higher risk of poor muscle quality in adjusted analyses.

Conclusions: These findings show a high prevalence of poor muscle quality among individuals with obesity, with age, sex and BMI being independent predictors.

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