Study finds poor muscle health is common in people living with obesity, increases risk of early death

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New research being presented at the European Congress on Obesity (ECO) in Venice, Italy (12–15 May) has found that poor muscle health is associated with a higher risk of an early death in people living with obesity.

Individuals with adverse muscle composition were up to three times more likely to die during the course of the study than those with healthy muscles, a Swedish study of people in the UK concluded.

"We found that just by looking at muscle composition we can predict which individuals with obesity are most likely to die during the next few years," says lead researcher Dr. Jennifer Linge, of AMRA Medical, a health informatics company in Linköping, Sweden.

Weight loss is increasingly recommended in the management of chronic conditions such as type 2 diabetes and cardiovascular disease and weight loss drugs are allowing people to lose larger amounts of weight than in the past.

However, with drugs now achieving weight loss close to the magnitudes seen with surgery, the concern for potential adverse effects on muscle health, such as significant loss of muscle mass and reduced mobility, is growing.

"Research has shown that although individuals with obesity have more muscle mass, their muscles are, in general, relatively weaker," says Dr. Linge. "They also have lower muscle quality, as well as reduced mobility and function.

"Accurate assessment of muscle composition, assessing both quantity and quality of the muscles during evaluation these treatments will teach

us whether significant and rapid weight loss is safe – especially for the more vulnerable patients, such as those with sarcopenic obesity or of older age."

There is also a need for more research on the importance of maintaining muscle health.

Previous research using magnetic resonance imaging (MRI) has linked poor muscle health with poor functional performance (lower grip strength, slower walking pace, more difficulty in climbing stairs and more prone to falls), ill health and death from any cause in individuals with non-alcoholic fatty liver disease (NAFLD) and in the general population.

But there is a lack of such data in individuals who are living with obesity.

To find out more, Dr. Linge and colleagues used AMRA Researcher (software that provides body composition measurements from MRI scans) to analyze scans from 56,109 participants in the UK Biobank study.

Muscle volume (muscle quantity) and muscle fat (indicating muscle quality) were quantified and a personalized muscle volume z-score (an indication of how their muscle volume compares to the average for their sex and body size) was calculated.

Participants were partitioned into four groups according to whether they had normal muscle composition, high muscle fat only, low muscle volume z-score only or adverse muscle composition (both high muscle fat and low muscle volume z-score).

A total of 9,840 participants (50% men, average age 64.4 years and BMI 33.5 kg/m^2) were living with obesity and had data available on sex, age,

BMI, and muscle composition. Of these. 2,001 (20.3%) had adverse muscle composition.

The participants were followed-up for an average of 3.9 years, during which time 174 died. The most common causes of death were ischemic disease (coronary heart disease) and hypertensive disease (primary hypertension, hypertensive heart disease and hypertensive renal disease).

While having low muscle volume z-score or high muscle fat alone was not significantly associated with a higher risk from death from any cause, adverse muscle composition (having both low muscle volume z-score and high muscle fat) was. This underlines the importance of assessing the amount of fat in muscle, as well as muscle volume, when evaluating muscle health, say the researchers.

Participants with adverse muscle composition were three times were more likely to die during follow-up than those with normal muscle composition.

The association between poor muscle health and all-cause mortality was still significant when strength (hand grip), other diseases (cancer, type 2 diabetes and coronary heart disease) and lifestyle factors (smoking, alcohol consumption, and physical activity) were taken into account. In this fully adjusted model, adverse muscle composition was associated with a 70% higher risk of early death.

Sex, age, type 2 diabetes and smoking were also associated with a higher risk of an early death.

The researchers concluded that adverse muscle composition was common in individuals living with obesity and significantly associated with all-cause mortality.

Dr. Linge adds, "The results indicate that maintaining muscle health is of paramount importance for people with obesity.

"Determining whether drugs achieving significant or rapid weight loss are causing excessive loss of muscle or worsen muscle quality will lead to safer treatment of obesity, both in general and in more vulnerable patients."

Provided by European Association for the Study of Obesity

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