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The Obesity Paradox: Could Obesity Be Beneficial to You?

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Currently, there is a misleading term called ‘healthy obese’ being used in literature. This term is used due to various studies highlighting the benefits of obesity on health, also known as ‘obesity paradox’ (Donini et al., 2020). The so-called 'obesity paradox' has piqued people's interest in recent years. Obesity paradox is a medical hypothesis which states that obesity may counterintuitively be protective, rather than detrimental in certain type of conditions and associated with higher survival chance in certain groups of people, such as the very elderly or those with certain chronic diseases. Despite the documented link between obesity and mortality in the general population, multiple studies have found that obesity improves survival in individuals with heart disease, cancer, diabetes, pulmonary disease, and renal disease, among other

disorders (Donini et al., 2020). Numerous studies have also reported protective effect of obesity from osteoporosis and sarcopenia (Hainer and Aldhoon-Hainerová, 2013; Morgan et al., 2020). Meta-analyses on the obesity paradox have also been published, causing some academics to conclude that the data's consistency is extraordinary, leaving little doubt that these observational data are beyond statistical patterns and bear biological plausibility.

Findings from a study by Advanced Medical and Dental Institute, Universiti Sains Malaysia and University of Nottingham Malaysia (Abidin, 2021) revealed that conclusions for Obesity Paradox should be approached with caution as they may not be so straight-forward. In the study, which comprised of 141 postmenopausal women aged between 45 and 88 years, majority of the participants were obese with healthy muscle mass and bone density (65.0%). These participants can generally be described as 'healthy obese'. The study found that muscle mass of the limbs (appendicular skeletal muscle mass) was significantly and positively correlated with bone density. However, no correlations, were observed between fat indices (body mass index, waist circumference and body fat percentage) and bone density, with and without controlling for confounders (muscle mass and age). This finding did not support the theory of protective effect of obesity on bones. However, the study found positive and significant correlations between fat indices and muscle mass, which supported prior findings on fat-induced muscle mass (Knowles et al., 2021, Morgan et al., 2020). Morgan et al. (2020) suggest that despite poor physical function and resistance to anabolic stimulation, obesity in older people may be associated with a higher volume of skeletal muscle mass in weight-bearing muscles compared to lean older people. These data support a paradox in which obesity may protect skeletal muscle mass in older adults. One explanation for these perplexing results could be that the anabolic response to weight-bearing activity is greater in obese vs. lean older people due to a larger mechanical stimulation, which compensates for the increased muscle anabolic resistance. In other words, due to the body's adaptation mechanism, muscles tend to increase along with the increase of adipose tissue in order to support body's general movement and also the increased weight, hence why obese people are likely to have high muscle mass. However, throughout the ageing process, there is likely to be a complicated interplay between muscle, adipose, and environmental stimuli that is ultimately damaging to health in the long run. Therefore, cautions must be taken when making conclusions.

In the case of findings by Abidin (2021), it is interesting to highlight that although the study cohort had significantly higher peripheral muscle mass compared to their normal weight counterparts, their handgrip strength was significantly weaker. This supports the 'quantity versus quality' argument whereby fat-induced muscle mass was theorized to have a lower quality compared to protein intake- and/or resistance trainings-induced muscle (Lee & Dierickx, 2018). One of the reasons is likely due to intramuscular fat infiltration, reducing the muscle function. Miljkovic and Zmuda (2010) have also reported positive correlations between fat mass and muscle mass, and an increase of intramuscular fat by 35.5-74.6% in men and 16.8-50% in women with aging. Findings by Abidin (2021) showed that the muscle mass of the 'healthy obese', while high, was not sufficient nor efficient in giving meaningful benefits to grip strength. From these findings, it is fair to hypothesize that obese individuals may require alternative cut-offs, or at least, a different set of criteria from normal population for the diagnosis of musculoskeletal disorders, especially due to the interconnected nature of bone, fat and muscle. Further, while the healthy obese group and the normal weight groups had similar amount of muscle mass, the healthy obese group had significantly higher weight and body fat mass compared to the normal group. This means that the obese group had significantly heavier weight to carry with equivalent amount of muscle mass compared to people with normal weight, fitting a 'moped pulling a speedboat' analogy, aptly used by Dr. Neil Binkley from the University of Wisconsin-Madison to describe sarcopenic obesity. This condition is dangerous as it can increase the risk of falls, causing serious muscle and bone-related injuries.

In order to promote correct phenotyping of patients, further research should be encouraged. Body composition phenotypes can accurately reflect the pathways of mortality in a variety of diseases by taking into account both body fat and lean mass, metabolic and functional factors, and the length of obesity (as well as normal weight). The obesity paradox should be approached with caution.

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