Intermittent Fasting attenuates age-related muscle atrophy: The underlying molecular mechanisms leading to proteins degradation in sarcolemma: Mice model

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Sarcopenia is a gradual loss of muscle mass and strength during aging that increases the risk of morbidity and mortality. Diet regimens that incorporate periods of fasting have gained popularity as a potential therapeutic approach to prolong quality and life expectancy and prevent disease. However, dieting may harm the elderly population and accelerate the breakdown of muscle protein. The sarcopenia is also manifested in a decrease in muscle strength because of damage to the transmission of force to the sides mediated by a complex of glycoproteins and the receptor for the insulin hormone.

The main aim was to measure the metabolic and biochemical changes in skeletal muscles during subsequent aging because of physiological adaptation to two intermittent fasting regimes.

Male mice C57BL/6 of different ages were divided into three groups: One, fasting and eating intermittently for 24 hours (Alternate-Day Fasting - ADF). The second, fasting for 18 hours and eating for 6 hours (Time-Restricted Feeding -TRF), and Third ad libitum, for 12 weeks. Outcome measurement included histological and immunohistochemical analysis, mass spectrometer imaging, morphological properties and clinical techniques.

Intermittent fasting improved body composition by less adipose tissue and more muscle tissue and maintains grip strength. TRF and ADF diets improve glucose uptake and sub-sarcolemma proteins such as Dystrophin and Plakoglobin, and increase signal transduction of Akt kinase.

TRF and ADF diets have elicited beneficial health effects. TRF and ADF may uncovering the therapeutic potential of caloric restriction to prevent or improve the prognosis of age-related diseases such as sarcopenia.