



ROLE OF RESISTANCE EXERCISE AND NUTRITIONAL INTAKE ON MUSCLE HYPERTROPHY

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Abstract

The age-associated loss of skeletal muscle mass and strength (sarcopenia) has been shown to increase the risk of injury due to falls and incidence of metabolic complications including insulin resistance and diabetes, which subsequently becomes a significant factor to disability among the elderly population. Nutrient intake is the most important anabolic stimuli for skeletal muscle. Specifically, intake of protein / amino acids (especially leucine) stimulate muscle protein synthesis. However, age-specific changes in muscle anabolic responses to amino acid leucine becomes apparent when sub-maximal amounts of amino acids are administered in older subjects. Consequently, recent evidence indicates that protein intake below RDA in older individuals further accelerates the age-associated muscle loss. Resistance exercise is another anabolic stimuli which increases myofibrillar muscle protein synthesis in both young and older individuals. The increased muscle anabolism is apparent within 2-3 hr after a single bout of heavy resistance exercise and remain elevated up to 2 days following the exercise. Subsequently, repeated bouts of resistance exercise as training increase muscle mass and function for both young and older individuals. A number of studies suggest cumulative effect of resistance exercise in combination with nutritional supplement on muscle protein metabolism. Recent evidence on other nutritional supplement in combination with resistance exercise will be discussed to propose possible preventative measures against sarcopenia.

Keywords: amino acids, skeletal muscle, protein synthesis, resistance exercise, muscle hypertrophy

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