Skeletal Muscle Mass & Function in Older Women
Health-Enhancing Influences of Combined Resistance Exercise & Diet

av

Emelie Strandberg

Akademisk avhandling

Avhandling för medicine doktorsexamen i idrottsvetenskap med inriktning fysiologi/medicin, som kommer att försvaras offentligt tisdagen den 12 december 2017 kl. 09.00, Hörsal G, Örebro universitet

Opponent: Professor Carl Johan Sundberg
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Abstract


Ageing is accompanied by a progressive decline in skeletal muscle mass and strength which may lead to impaired ability to perform activities of daily living in older adults. Although the exact cause of the gradual decline in muscle mass is unknown, identifying efficient strategies aiming to prevent age-related loss of muscle mass and strength is important in order to promote healthy ageing. The overall aim of this thesis was to explore the effects of resistance training alone or combined with a healthy diet on skeletal muscle mass and function of healthy recreationally active older women and to determine mechanisms by which elevated systemic inflammation may contribute to the age-related decline of muscle mass in older adults. The combination of resistance training and a healthy diet induced gains in leg lean mass as well as greater gains in dynamic explosive force than resistance training alone in healthy recreationally active older women. The observed gains in leg lean mass were accompanied by increases in the size of type IIA muscle fibres together with down-regulation in gene expression of a pro-inflammatory factor (IL-1β) and upregulation in gene expression of a regulator of cellular growth (mTOR) in skeletal muscle of older women. Additionally, reduced muscle protein synthesis and size of muscle cells may mediate the detrimental effects of elevated circulating markers of inflammation on muscle mass in older adults. In conclusion, the present thesis depicts mechanistic links between elevated systemic marker of inflammation and muscle mass and provides new information on the effects of combined resistance training and healthy diet on muscle mass and strength in a group of healthy recreationally active older women. This knowledge is instrumental for development of strategies aiming to prevent age-related loss of muscle mass and function.

Keywords: Healthy ageing, Chronic inflammation, C-reactive protein, Omega-3 fatty acids, Resistance training, Physical function

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