Long Term Capsaicin Administration Effects on Skeletal Muscle Function in Aging Mice

Marisa C. Benson, Candace R. Receno, Angela Le, Sarah Ruby, Chen Liang, Lara R. DeRuisseau, Keith C. DeRuisseau.
Syracuse University, Syracuse, NY, Le Moyne College, Syracuse, NY

The decline in muscle mass and quality that occurs during aging, termed sarcopenia, can decrease physical function and negatively affect overall quality of life. Administration of capsaicin (C), the spicy ingredient in peppers, can attenuate disuse-mediated muscle atrophy via mechanisms involving activation of transient receptor potential vanilloid 1 receptors. However, the potential benefit of capsaicin administration on aging skeletal muscle is unknown. **PURPOSE:** We tested the hypothesis that long term capsaicin administration would attenuate decreases in skeletal muscle mass and function that occur with aging. **METHODS:** Twenty-four month old male C57BL/6J mice received capsaicin (C; 50 mg/kg food weight; n=8) or lecithin vehicle (L; n=9) diets ad libitum for a duration of 8 weeks. Following this period, animals were anesthetized using isoflurane and the extensor digitorum longus (EDL) was harvested and vertically suspended in a Kreb's- Ringer buffer maintained at 25°C to assess skeletal muscle contractile properties. Animal body mass, muscle mass and contractile characteristics were analyzed using an independent samples t-test. Data are expressed as mean±SEM. **RESULTS:** Animal body mass, muscle mass, and muscle mass:body mass ratio were similar between groups ($p>0.05$). Maximal force generation (sPo) of the EDL did not differ ($p>0.05$) between groups (C: 12.75±1.20 N/cm^2 vs. L: 9.47±1.24 N/cm^2). However, peak twitch tension (sPt) was greater in capsaicin treated muscles (C: 2.09±0.31 N/cm^2 vs. L: 1.31±0.45 N/cm^2; $p<0.05$). Fatigability, reported as a percentage of initial force generation following 30 seconds of contractions, was not different between groups (C: 38.88±1.11 vs. L: 41.16±2.63; $p>0.05$). **CONCLUSION:** Long term capsaicin administration preserved peak twitch tension but did not alter maximal force generation, fatigability, or mass of the muscle.

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