

Effects of Gelatin Supplementation on Skeletal Muscle Recovery Following Eccentric Exercise

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ABSTRACT

Exercise is a potent stimulus for skeletal muscle health. Strenuous exercise can result in exercise-induced muscle damage, characterized by soreness, inflammation, and impaired muscle function. Collagen supplementation has garnered attention as a means to improve muscle recovery and musculoskeletal health. Gelatin is a cost-effective and commercially available form of collagen supplementation. The impact of collagen supplementation, via gelatin, on muscle recovery following strenuous exercise is unknown. **PURPOSE:** To test the efficacy of collagen supplementation, via gelatin, on indices of skeletal muscle recovery following eccentric exercise. **METHODS:** Healthy, recreationally-active adults (28.4 ± 4.7 yrs; 5 M, 6 F; BMI: 24.1 ± 2.11 kg/m²) were randomly assigned to receive one of two supplements, twice daily throughout the study: gelatin (GEL, 15g collagen) or placebo (PLA, agar). Participants performed 150 maximal eccentric unilateral knee extensions on an isokinetic dynamometer. Measures of muscle soreness (MS) and function of the exercised limb were performed prior to exercise (PRE) and 24hrs, 72hrs, and 168hrs post-exercise. MS was assessed using a Visual Analog Scale. Muscle function (peak isokinetic torque, PIT) was assessed on an isokinetic dynamometer. **RESULTS:** Static MS was increased ($P < 0.05$) 24hrs (PLA: 31.8 ± 25.2 mm, GEL: 17.2 ± 10.9 mm) and 72hrs (PLA: 23.2 ± 19.7 mm, GEL: 17.3 ± 12.7 mm) post-exercise. Concentric MS was increased ($P < 0.05$) 24hrs (PLA: 54.8 ± 25.8 mm, GEL: 34.3 ± 6.74 mm) and 72hrs (PLA: 41.2 ± 32.9 mm, GEL: 34.3 ± 12.8 mm) post-exercise. Eccentric MS was increased ($P < 0.05$) 24hrs (PLA: 57.9 ± 28.7 mm, GEL: 44.7 ± 15.4 mm) and 72hrs (PLA: 40.4 ± 34.8 mm, GEL: 37.3 ± 19.8 mm) post-exercise. No group effect was present for ratings of muscle soreness. PIT (60 deg/sec) was decreased ($P < 0.05$) 24hrs post-exercise in PLA ($69.9 \pm 12.5\%$ of PRE, $P=0.034$) but not GEL ($73.1 \pm 20.3\%$ of PRE, $P=0.13$). PIT at 72hrs and 168hrs post-exercise was not different ($P > 0.05$) from PRE in either group. **CONCLUSION:** These data suggest that gelatin supplementation does not impact muscle soreness, however it may be effective in preserving muscle function following eccentric exercise. Further research is needed to determine the impact of gelatin supplementation on alterations to skeletal muscle morphology following exercise.