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**Effect of moderate Alcohol consumption on recovery
from Eccentric Exercise Induced Muscle Damage in
Females**

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1. Abstract

Introduction: Unaccustomed eccentric contractions produce micro-structural damage to skeletal muscle, initiating a chain of events involving inflammation, pain, and impaired muscle performance. These effects are felt most between 24-72 hours post exercise, but can last anywhere from a few days up to a week. Sports involving a large eccentric component include those that are running-based; with resulting damage often impacting on successive games (common during competition), or on ability to train. Binge-drinking post-games is a common activity seen amongst athletes; particularly those involved in team sports. Both acute and chronic alcohol consumption have known negative impacts on the brain and body organs and being classified as a drug, has associated regulations and restrictions. Athletes require fast recovery from exercise-induced muscle damage for optimal performance in subsequent games or training. The effect of alcohol, exercise, and/or the combination of the two may have a negative effect on muscle recovery post-game following an acute intake of alcohol. While these types of studies have been carried out on males, as of yet no such study has been done on females. Due to physiological differences, there may be variation in muscle response to alcohol compared to that of males. Thus the purpose of this study was to compare the effects of alcohol consumption post exercise-induced muscle damage, with that of an iso-caloric placebo on muscle recovery in females.

Methods: Eight females (mean age 23 years; $65.2 \pm 15\text{kg}$; $164 \pm 5.5\text{cm}$) participated in a controlled, randomized, cross-over design study. Following a prescribed standardised meal, they carried out a damage protocol in which 300 maximal

eccentric contractions of the quadriceps femoris muscle were performed on an isokinetic dynamometer. Post-exercise, an alcoholic beverage or a placebo was consumed. Treatment type and leg of damage were randomly assigned as evenly as possible, with the two trials being separated by a month. Measures of maximal isokinetic (concentric and eccentric) torque and isometric tension produced across the knee were measured in both the exercised and control leg pre-exercise, 36 hours (h) and 60h post-exercise. Creatine kinase activity and muscle soreness ratings (squat and step) were taken prior to damage and post-exercise up to 60h.

Results: A moderate amount of alcohol consumption following eccentric exercise, significantly reduced isometric, concentric and eccentric peak and average peak torque 36h and 60h post-exercise (all $p < 0.05$). Significance differences in force output between time points were seen only in peak and average concentric torque. All three contraction types showed a significant time * treatment interaction effect ($p < 0.05$). Creatine kinase and ratings of perceived muscle soreness did not significantly differ between treatments.

Conclusions: Our results suggest that similar to males, the consumption of alcohol following eccentric exercise-induced muscle damage elicits a greater reduction in muscle performance in the days following damage in females.

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