

Effect of Acute Alcohol Ingestion on Resistance Exercise–Induced mTORC1 Signaling in Human Muscle

Duplanty, Anthony A., Budnar, Ronald G., Luk, Hui Y., Levitt, Danielle E., Hill, David W., McFarlin, Brian K., . . . Vingren, Jakob L. (2017). Effect of acute alcohol ingestion on resistance exercise-induced mTORC1 signaling in human muscle. *Journal of Strength and Conditioning Research*, 31(1), 54-61.

<http://doi.org/10.1519/JSC.0000000000001468>

Abstract

The purpose of this project was to further elucidate the effects postexercise alcohol ingestion. This project had many novel aspects including using a resistance exercise (RE) only exercise design and the inclusion of women. Ten resistance-trained males and 9 resistance-trained females completed 2 identical acute heavy RE trials (6 sets of Smith machine squats) followed by ingestion of either alcohol or placebo. All participants completed both conditions. Before exercise (PRE) and 3 (+3 hours) and 5 (+5 hours) hours postexercise, muscle tissue samples were obtained from the vastus lateralis by biopsies. Muscle samples were analyzed for phosphorylated mTOR, S6K1, and 4E-BP1. For men, there was a significant interaction effect for mTOR and S6K1 phosphorylation. At +3 hours, mTOR and S6K1 phosphorylation was higher for placebo than for alcohol. For women, there was a significant main effect for time. mTOR phosphorylation was higher at +3 hours than at PRE and at +5 hours. There were no significant effects found for 4E-BP1 phosphorylation in men or women. The major findings of this study was that although RE elicited similar mTORC1 signaling both in men and in women, alcohol ingestion seemed to only attenuate RE-induced phosphorylation of the mTORC1 signaling pathway in men. This study provides evidence that alcohol should not be ingested after RE as this ingestion could potentially hamper the desired muscular adaptations to RE by reducing anabolic signaling, at least in men.