SWACSM Abstract

Combined Blood Flow Restriction Training and Betaine Supplementation Impacts on Serum Betaine and Homocysteine Concentrations

STEVEN B. MACHEK[1,2], EMILIA E. ZAWIEJA,[3] JEFFREY L. HEILESON[2], DILLON R. HARRIS[2], DYLAN T. WILBURN[2], JASON M. CHOLEWA[4], & DARRYN S. WILLOUGHBY, FACSM[2,5]

[1] Kinesiology Department, California State University; Monterey Bay, CA
[2]Department of Health, Human Performance, and Recreation, Baylor University; Waco, TX
[3]Department of Human Nutrition and Dietetics, The Poznań University of Life Sciences; Poznań, Poland
[4]Human Physiology Department, University of Lynchburg; Lynchburg, VA
[5]School of Exercise and Sport Science, University of Mary Hardin-Baylor; Belton, TX

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Willoughby, Darryn (dwilloughby@umhb.edu)

ABSTRACT
Homocysteine (HCY) is a clinically implicated in inflammation and cardiovascular impairments. Although both betaine supplementation and acute resistance (both high-load [HL] and low-load blood flow restriction [LL-BFR]) training notably attenuate HCY concentrations, it is hitherto unknown if these independent modalities synergistically interact. **PURPOSE:** to determine whether a combination of betaine supplementation, as well as acute HL and/or LL-BFR training can attenuate post-exercise HCY more effectively than either isolated modality. **METHODS:** Eighteen recreationally trained males (25±5y) were randomized in double-blind fashion to supplement 6g/day of either betaine anhydrous (BET) or identically dosed cellulose placebo for 14-days. Subsequently, all subjects performed four standardized sets of one-leg press and two additional sets to muscular failure on both legs in a counter-balanced and crossover design. Specifically, one leg performed standard high-load (HL; 70%1RM) exercise and contralateral limb underwent BFR (LL-BFR; 20%1RM) training at 80% arterial occlusion pressure. Serum homocysteine (HCY) and betaine (BET) concentrations were analyzed before and 30-minutes post-exercise prior to quantification via ELISA and liquid chromatography-mass spectrometry, respectively. The changes in all aforementioned variables from baseline (ΔHCY and ΔBET) were assessed via separate two-way mixed model ANOVA with repeated measures at a significance level of $p<.05$. **RESULTS:** Analyses failed to reveal any significant main nor interaction effects for serum ΔBET. Although no apparent main supplement nor interaction effects were observed, ΔHCY demonstrated a significant main exercise condition effect ($p=.045$; $\eta_p^2=.228$), whereby the LL-BFR group displayed significantly greater concentrations versus HL ($p=.045$). **CONCLUSION:** While these findings ultimately do not support a betaine-resistance training synergy-mediated reduction in serum HCY, our data otherwise suggest BFR training may preferentially result in lower post-training concentrations relative to a commonly employed, high-load approach. Future research should elucidate the credence of this interpretation via additional longitudinal investigations amidst hyperhomocysteinemia-predisposed clinical populations.