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Effects of a fruit/berry/vegetable supplement on muscle function and oxidative stress.

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Abstract

PURPOSE: This study tested the effectiveness of a fruit, berry, and vegetable concentrate (FVC), Juice Plus+® (NSA LLC, Collierville, TN), supplement on muscle function and oxidative stress in response to an acute bout of eccentric exercise (EE).

METHODS: Forty-one healthy volunteers (age = 18-35 yr) were randomly assigned to either a placebo (P) or an FVC treatment taking capsules for 28 d (6 d(-1)) before EE and for the next 4 d. All subjects completed four sets of 12 repetitions of eccentric elbow flexion with their nondominant arm. Blood, muscle soreness (MS), range of motion (ROM), and maximal isometric force (MIF) of the elbow flexors were obtained before and immediately after exercise and at 2, 6, 24, 48, and 72 h postexercise. Plasma was analyzed for creatine kinase (CK), lipid hydroperoxides, malondialdehyde (MDA), and protein carbonyls (PC). Glutathione ratio was determined from whole-blood extracts.

RESULTS: MS, ROM, MIF, and plasma CK demonstrated significant time effects independent of treatment. MS and plasma CK increased over time, whereas ROM and MIF decreased over time. There was a significant time and time × treatment effect for plasma PC and MDA. PC and MDA increased over time in the P group ($P < 0.01$) but were not significantly altered in the FVC-treated group at any time. No significant changes were noted in lipid hydroperoxides. The glutathione ratio was elevated immediately postexercise in both groups ($P < 0.01$) and elevated 6 h postexercise with P compared with the FVC-treated group ($P < 0.05$).

CONCLUSION: This study reports that 4 wk of pretreatment with an FVC can attenuate blood oxidative stress markers induced by EE but had no significant impact on the functional changes related to pain and muscle damage.

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