Assessment of the antioxidant effectiveness of alpha-lipoic acid in healthy men exposed to muscle-damaging exercise.


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OBJECTIVE: The aim of this study was to compare the indices of glutathione antioxidant system and oxidative damage level in resistance trained and untrained subjects and to assess the antioxidant action of alpha-lipoic acid in trained men exposed to muscle-damaging exercise.

METHODS: Thirteen trained and twenty untrained men (NT) participated in the comparative study. Then trained men were randomly assigned to T(CON) group (control) or T(ALA) group (alpha-lipoic acid, 600 mg . day(-1), for 8 days) and performed isometric/isokinetic effort of quadriceps muscles.

RESULTS: The study has shown the significantly higher erythrocyte levels of glutathione (GSH), glutathione reductase (GR) and glutathione peroxidase (GPx) in T(CON) than NT but no differences in plasma lipid peroxidation (TBARS) and protein carbonylation (PC). However, total thiol (TT) concentration was two-fold lower in T(CON) than NT group. alpha-Lipoic acid variously influenced the post-exercise levels of GSH (+40%), GR (-24%) and GPx (+29%), but markedly reduced by over 30% the resting and post-exercise TBARS and PC in T(ALA) compared with T(CON). TT concentration significantly increased in T(ALA) but it did not reach the high level which was found in untrained group.

CONCLUSION: It is concluded that alpha-lipoic acid supplementation diminishes oxidative damage. It does not abolish differences in glutathione antioxidant system between untrained and trained subjects but modulates a pro-antioxidant response to the muscle-damaging exercise.

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