Influence of different types of exercise on the expression of haem oxygenase-1 in leukocytes

Abstract:

Haem-oxygenase-1 (HO-1) is an antioxidant stress protein that is mainly induced by reactive oxygen species, inflammatory cytokines and hyperthermia. We assessed the influence of different types of exercise on HO-1 expression in leukocytes of the peripheral blood in three groups of male participants: a short exhaustive run above the lactate steady state \( (n = 15) \), eccentric exercise \( (n = 12) \) and an intensive endurance run \( (\text{half-marathon}, n = 12) \). Blood samples were taken at rest and up to 24 h after exercise. Blood lactate concentration after exercise was 9.0 +/- 2.1, 3.8 +/- 1.6 and 5.1 +/- 2.2 mmol x l(-1) (mean +/- s) for the exhaustive run, eccentric exercise and half-marathon groups, respectively \( (P < 0.05) \). Creatine kinase concentration was highest 24 h after exercise: 133 +/- 91, 231 +/- 139 and 289 +/- 221 U x l(-1) for the exhaustive run, eccentric exercise and half-marathon groups, respectively \( (P < 0.05) \). The maximal increase in leukocyte counts after exercise was 11.5 +/- 19.2, 6.2 +/- 1.4 and 14.7 +/- 2.1 x 10(9) x l(-1). There was no change in HO-1 as a result of the short exhaustive run or the eccentric exercise, whereas the half-marathon had a significant stimulatory effect on HO-1-expression in lymphocytes, monocytes and granulocytes \( (P < 0.001) \) using flow cytometry analyses. In conclusion, eccentric exercise alone or short-term
heavy exercise are not sufficient to stimulate the antioxidative stress protein HO-1 in peripheral leukocytes

Stichworte: Adult; Creatine Kinase/blood; Exercise/*physiology; Heme Oxygenase (Decyclizing)/metabolism; Heme Oxygenase-1; Humans; Lactic Acid/blood; Leukocyte Count; Leukocytes/*enzymology; Male; Membrane Proteins; Physical Endurance/physiology; Running/physiology

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