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» Journal Abstract

The effect of oxygen uptake at anaerobic threshold on resting plasma concentrations of reduced glutathione and thiobarbituric acid reactive substances (TBARS), and on the antioxidant enzyme activity in blood
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The aim of the study was to determine the resting activities of antioxidant enzymes (SOD, CAT, GPX) and the concentration of reduced glutathione (GSH) in blood, as well as of the lipid peroxidation products (TBARS) in plasma of subjects with similar maximal oxygen uptake but differing in oxygen uptake and utilisation at the anaerobic threshold (AnT). Twenty physical education students, characterised by a high (HT group) or low (LT group) oxygen uptake at AnT, participated in the study. The reduced glutathione (GSH) concentration in whole blood was significantly higher in the HT than in LT group. Resting SOD and CAT activities in erythrocytes and GPX in blood were similar in all subjects but HT and LT groups differed significantly in the SOD/GPX and CAT/GPX activity ratios. Resting plasma TBARS concentrations significantly correlated with oxygen uptake and oxygen utilisation (%VO₂max) at the anaerobic threshold only in the HT group ($r=0.65$ and 0.83 , respectively). It was suggested that a higher endurance fitness, expressed by the oxygen uptake and utilisation at the anaerobic threshold, resulted in an increased production of lipid peroxides. Simultaneously, a higher resting blood GSH reflects a better antioxidant protection of erythrocytes. Although a higher oxygen uptake and utilisation at the anaerobic threshold did not increase the activities of antioxidant enzymes in erythrocytes, it affected activity ratios. These changes might represent the initial stage of the erythrocyte adaptation to the oxidative stress induced by an increased oxygen uptake.

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