

Thesis Title Effect of endurance exercise on lipid peroxidation product and on scavenging enzymes in short and long distance runners.

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ABSTRACT

This study was designed to investigate between the influence of training in short and long distance runners and the effect of endurance exercise on the activities of the scavenging enzymes in erythrocyte such as superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GSH-Px). Plasma malondialdehyde (MDA), LDH and CPK activities were determined as well. Under resting condition, SOD activity was higher (1.4 fold, $P < 0.05$) only in long distance runners than in sedentary subjects but CAT and GSH-Px activities were higher (3 folds and 7.5 folds, respectively, $P < 0.001$) in both short and long distance runners. Each subject was then performed on a bicycle ergometer at 70% of maximum heart rate for 60 minutes. Venous blood were collected before and 5 minutes, 24 and 48 hours after endurance exercise. The enzyme activities were not changed significantly in both

short and long distance runners except the reduction of CAT activity as a result of the inactivation by O_2^- . In sedentary subjects, however, SOD, CAT and GSH-Px activities were significantly decreased by about 34.23%, 22.72% and 20.33%, $P < 0.001$, respectively and gradually return to pre-exercise level through the replacement with young erythrocytes which contain higher activities of these enzymes. These results showed that training in short and long distance runners increased the activities of the main free radicals scavenging enzymes in erythrocyte and the influence of endurance exercise inactivated only the CAT activity. Moreover, plasma MDA (index of lipid peroxidation), LDH and CPK activities (index of muscle damage) were increased after endurance exercise, with peak values observed at 24 hours (MDA, LDH) and 48 hours (CPK) in these 3 groups. This suggests a possible relationship between free radical generation and exercise-induced muscle damage by less increasing in both short and long distance runners. Thus, a degree of adaptation to training in short and long distance runners might be effective in muscle damage protection.