

Effect of Exercise Intensity on Antioxidant Enzymatic Activities in Sedentary Adults

ABSTRACT

This study was designed to investigate the influence of relative exercise intensity on antioxidant enzymatic activities in sedentary healthy adults after cycling at different exercise intensity (50%VO₂max, 60%VO₂max and 70%VO₂max) for 10 minutes. Venous blood were collected pre- and immediately post-exercise from 24 sedentary healthy adults (mean age= 20.83 ± 2.32 years, VO₂max =2.15 ± 0.36 liter/min, BMI= 21.01 ± 4.27 kg/m²). Erythrocyte enzymes, i.e catalase (CAT), superoxide dismutase (SOD) and glutathione peroxidase (GPx) were measured as indirect measures of reactive oxygen species (ROS) production. (Subject cycled on the cycle ergometer with the estimated workload that corresponds to the measured maximal oxygen uptake (VO₂max) that assigned or given to exercise intensity at the speed of 50 to 60 revolutions per minute (rpm) for 10 minutes.) Heart rate (HR) and VO₂ were monitored every minute during exercise test to ensure the subject was exercising at the relative exercise intensity given. Data were analysed with repeated measured ANOVA and paired t-tests. SOD increased significantly (p<0.05) by 25.3%, 55.8%, and 49.6% immediately post-exercise at 50%VO₂max, 60%VO₂max and 70%VO₂max respectively, with a significant exercise intensity effect. On the other hand, 24.1% increment in CAT activity at 50%VO₂max, and 38.1% and 10.0% decrement at 60%VO₂max and 70%VO₂max were also significantly affected by exercise intensity (p<0.05). No significant changes in GPx activity were noted. These data suggested that ROS such as superoxide anions (O₂⁻), hydrogen peroxide (H₂O₂), and hydroxyl radicals (OH⁻) production increased as the exercise intensity increased. The changes in SOD, CAT and GPx activity were closely related to exercise intensity. The decrement observed in CAT and GPx activity levels would indicate the presence of oxidative stress.