

Oxidative stress and antioxidant enzymes activity after cycling at different intensity and duration

ABSTRACT

This study aimed to compare the effects of intensity (I) and duration (D) on the oxidative stress marker (malondialdehyde, MDA) and the responses of the antioxidant enzymes (catalase, CAT; glutathione peroxidase, GPx; superoxide dismutase, SOD) among sedentary adults. In a crossover design, 25 sedentary adults performed nine cycling exercise sessions with a constant load of 50%, 60%, and 70% $\dot{V}O_{2peak}$ for 10-, 20-, and 30-min each. Plasma MDA, CAT, GPx, and SOD activity were measured before and immediately after each exercise session. Results show that MDA concentration and SOD activity increased significantly immediately after exercise at all intensities and durations, except SOD decreased significantly at 70% $\dot{V}O_{2pk}$ for 30 min. CAT activities also increased significantly after exercise at 50% $\dot{V}O_{2pk}$ for 10 and 20 min but decreased at 60% $\dot{V}O_{2pk}$ for 30 min and at 70% $\dot{V}O_{2pk}$ for all durations. GPx activity decreased significantly after 20 and 30 min at all intensity levels. In conclusion, our results show that cycling at 50%, 60%, and 70% $\dot{V}O_{2pk}$ for 10, 20, and 30 min increased oxidative stress and antioxidant activities, but with different responses. These findings suggest that the starting exercise intensity for sedentary adults should not exceed 70% $\dot{V}O_{2pk}$.