A SINGLE DOSE OF INORGANIC NITRATE DOES NOT ALTER THE REDOX BALANCE OF INDIVIDUALS SUBMITTED TO A MAXIMAL EXERCISE TEST UNTIL EXHAUSTION

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The role of inorganic nitrate in the redox balance, associated with physical exercise has not been fully elucidated yet. The purpose of this study was to evaluate the effect of acute supplementation with sodium nitrate in the redox balance of men undergoing an incremental test of maximal effort on a cycle ergometer. Twelve men (age: 23 ± 3.39 yr, height: 179.41 ± 7.72 cm, body weight: 72.86 ± 10.14 kg, VO₂ peak = 42.81 ± 1.57mL.kg⁻¹.min⁻¹) were randomly assigned in a double-blind crossover design to receive a single dose of either sodium nitrate (NaNO₃) or placebo (NaCl), 10 mg. kg⁻¹ of body mass dissolved in 250 mL of water. The volunteers performed an incremental test on a cycle ergometer until voluntary exhaustion. Blood was collected 5 minutes after exhaustion test and three hours after nitrate supplementation. Plasma samples were used for nitrite dosage, total antioxidant activity by FRAP method, and cyclic voltammetry. Hemolysate was used to measure catalase activity and lipid peroxidation products reactive to thiobarbituric acid (TBARS). Concentrations of plasma nitrite were higher in the supplemented group compared to placebo before (48.50 ± 3.6 vs 67.45 ± 6.0 µmol / L) and after the maximal exercise test (54.75 ± 3.4 vs 80.33 ± 6.6 µmol / L). There was no difference in catalase activity for the supplemented group compared to placebo both before and after maximal exercise test. We did not observe differences in the anodic peak potential (Epa) and their respective currents (Ia), or on plasma ability to reduce ferric ions. Furthermore, there was no difference in lipid peroxidation measured by TBARS method. These findings indicate that a single dose of inorganic nitrate does not cause imbalance in the redox balance and therefore oxidative damage in individuals submitted to maximal exercise test until exhaustion.

Keywords: nitrate, redox balance and exercise

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