Nitrate supplementation modulates systolic blood pressure and improves antioxidant salivary markers

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Introduction: Nitrate supplementation has been described to increase nitric oxide concentration, which may contributes to improving profile oxidative. In high levels, oxidative stress negatively affects on vascular health, causing endothelial dysfunction.

Objectives: Evaluate the acute (AC) and prolonged (PT) effects of nitrate supplementation on blood pressure responses to exercise and antioxidant salivary markers.

Materials and Methods: 14 physically active male subjects (aged 22.07±3.29 years; BMI: 22.92 kg/m²±3.62) were submitted to an incremental test on a cycle-ergometer to specify the maximal load. Physical tests (50% of maximal load during 30min) had an interval of five days between them. Subjects were randomly assigned in a double-blind, crossover design to follow 5 days of supplementation with either sodium nitrate (NO group, 10 mg/kg⁻¹ of body mass) or sodium chloride (PL, placebo group). AC comprises supplementation 1 hour before the test. Saliva samples collection were: 0’, one hour after supplementation, immediately after exercise, 30’ and 60’ after exercise. Blood pressure and heart rate were monitored throughout the test. The concentration of nitrite, uric acid and superoxide dismutase activity were determined by colorimetric methods. Total antioxidant capacity and lipid peroxidation were determined by FRAP and TBARS technique, respectively.

Results: An increase in salivary nitrite was observed in response to nitrate supplementation throughout the samples collection on either AC or PT. According to area under curve, systolic blood pressure profile was lower in NO group in PT when compared with PL group. At the same treatment, uric acid concentration and FRAP were higher in NO group than PL group. However, there was no difference on either SOD activity or TBARS.

Conclusion: We found that 5 days of nitrate supplementation had a positive effect on SBP and salivary antioxidant markers which may contribute to improve the endothelial health. Salivary nitrite may offer an alternative to evaluate changes in hemodynamics responses.

Key words: Nitrate, saliva and oxidative stress, exercise.