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J Sports Med Phys Fitness. 2017 Apr 26. doi: 10.23736/S0022-4707.17.06883-9. [Epub ahead of print]

Effects of hydrogen rich water on prolonged intermittent exercise.

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Abstract

BACKGROUND: Recent studies showed a positive effect of Hydrogen Rich Water (HRW) intake on acid-basic homeostasis at rest. We investigated 2-weeks of HRW intake on repeated sprint performance and acid-base status during prolonged intermittent cycling exercise.

METHODS: In a cross over single-blind protocol, eight trained male cyclists (age [mean ± SD] 41±7 years, body mass 72.3±4.4 kg, height 1.77±0.04 m, maximal oxygen uptake [V̇ O2max] 52.6±4.4 ml·kg-1·min-1) were provided daily with 2 liters of placebo normal water (PLA, pH 7.6, oxidation/reduction potential [ORP] +230 mV, free hydrogen content 0 ppb) or HRW (pH 9.8, ORP -180 mV, free Hydrogen 450 ppb). Tests were performed at baseline and after each period of two weeks of treatment. The treatments were counter-balanced and the sequence randomized. The 30-min intermittent cycling trial consisted in ten 3-min blocks, each one composed by 90 sec at 40% V̇ O2max, 60 sec at 60% V̇ O2max, 16 sec all out sprint, and 14 sec active recovery. Oxygen uptake (V̇ O2), heart rate and power output were measured during the whole test, while mean and peak power output (PPO), time to peak power and fatigue index (FI) were determined during all the 16 sec sprints. Lactate, pH and bicarbonate [HCO3-] concentrations were determined at rest and after each sprint on blood obtained by an antecubital vein indwelling catheter.

RESULTS: In the PLA group, PPO in absolute values decreased significantly at the 8th and 9th of 10 sprints and in relative values, ΔPPO, decrease significantly at 6th, 8th and 9th of 10 sprints (by mean: -12±5%, $p<0.006$), while it remained unchanged in HRW group. Mean power, FI, time to peak power and total work showed no differences between groups. In both conditions lactate levels increased while pH and [HCO3-] decreased progressively as a function of the number of sprints.

CONCLUSIONS: Two weeks of HRW intake may help to maintain PPO in repetitive sprints to exhaustion over 30 minutes.

PMID: 28474871 DOI: 10.23736/S0022-4707.17.06883-9