Effects of Sodium Bicarbonate Dosage on Blood Lactate Levels in Trained and Recreational Athletes

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Sodium Bicarbonate ($NaHCO_3$) can be taken as an ergogenic aid for anaerobic athletes, in order to boost performance. It works by increasing the extracellular buffering capacity and promoting the flow of hydrogen ions across the sarcolemma. **PURPOSE**: To test if $NaHCO_3$ will cause blood lactate levels to increase and improve performance time in sprint cycle work in anaerobic and non-anaerobic populations. **METHODS**: 13 healthy, college males (9 anaerobic athletes and 4 recreational athletes) (M±SD: age= 21.54±1.05, mass (kg) = 90.3±19.6, height (cm) = 181.4±10.1) participated in the study. Subjects were required to pedal a distance of 0.6 km on a bike ergometer at a KP load relative to their body mass (body mass x (0.075) x (0.7). Subjects repeated this protocol for 4 different trials [(1) Baseline, (2) 24 hr. dose, (3) 1 hr. dose, (4) control]. Prior to 24-hr. and 1-hr. trials, the subjects ingested $NaHCO_3$ (0.3g per kg of body mass) over 24-hr or 1-hr span, respectively. **RESULTS**: Data was analyzed using a two-way ANOVA between group(s) and condition(s). The anaerobic athletes' post exercise blood lactate levels, when supplementing with the $NaHCO_3$, were higher (24hr: 16.76 and 1hr: 15.86 mmol/L) than the baseline and control days (13.57 and 14.13 mmol/L, respectively). The recreational athletes, on the other hand, had the opposite effect where blood lactate level was highest during baseline testing (15.95 mmol/L), while the treatment and control conditions showed lower values (24 hr. = 14.2 mmol/L, 1hr= 13.7 mmol/L, control= 13.63 mmol/L). The recreational athletes elicited the best time trials while supplementing with $NaHCO_3$, with the fastest time at 1 hr. treatment (48.38 sec) and the 24hr. treatment being the second fastest (50.68 sec.). The baseline and controls had the slowest times (54.25 and 50.95 sec), respectively. However, these differences in time and lactate levels, across conditions as well as between groups, were not statistically significant. **CONCLUSION**: Though not significantly different, ingesting $NaHCO_3$ could moderately aid in performance time and boost blood lactate levels as shown in this study. Future research should consider exploring higher KP loads, longer or shorter test, and quantity and timing of dosing $NaHCO_3$.