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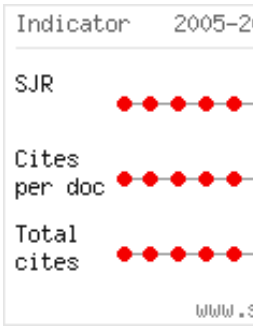


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# Exercise performance and neuromuscular activity at a fixed level of RPE following manipulation of peripheral physiological status.

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## Abstract

## Purpose

To analyse the effect of manipulation of peripheral physiological status on performance and neuromuscular activity during cycling at a fixed level of RPE.

## Methods

Following familiarisation trials, seven well trained individuals completed two exercise trials following ingestion of 0.2g.kg$^{-1}$ $NaHCO_3$ or a $CaCO_3$ placebo which were performed in a randomised and blind manner. During exercise participants were required to cycle at an exercise intensity equivalent to their perception of an RPE of 16 on the Category Ratio Scale. Blood pH was measured pre- and post-exercise, and power output, EMG

activity in the active musculature, and heart rate were recorded continuously throughout exercise. Exercise was terminated when power output fell below 80% of the average recorded over the first 3 minutes of each trial.

## Results

Pre-exercise pH was higher following $NaHCO_3$ ingestion, but post-exercise values did not differ between $NaHCO_3$ and placebo trials. Exercise duration was 21% longer following $NaHCO_3$ than the placebo, but no significant differences were found in power output or heart rate between trials at any point. EMG activity was higher throughout $NaHCO_3$ trials.

## Conclusions

The findings of this study

suggest that $NaHCO_3$ ingestion enhanced exercise duration by allowing an increased volume of exercise to be performed prior to individuals reaching individual critical threshold values for pH. Lower neuromuscular activity despite a similar power output following $NaHCO_3$ suggests that perceptions of effort may be based on absolute work rates rather than afferent physiological feedback, and that the work rate is achieved through regulation of efferent neural drive.

Key words: Perceived exertion; Electromyography; Sodium bicarbonate

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