THE EFFECTS OF SODIUM BICARBONATE SUPPLEMENTATION ON BLOOD LACTATE ACCUMULATION.

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Abstract

The purpose of this study was to determine the effects of sodium bicarbonate supplementation on blood lactate and muscle soreness.

Methods (continued)

• Five recreationally active subjects (three males, two females) from University of Texas at Arlington Kinesiology Department volunteered for this study.

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<th>Age</th>
<th>Height</th>
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<td>22.4 ± 0.55 years</td>
<td>183.9 ± 5.3 cm</td>
<td>86.4 ± 14.5 kg</td>
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• Instruments used for this study were Monark Exercise AB 828E Ergomedic Exercise Bike, blood lactate analyzer, heart rate monitor, and Borg scale for rating of perceived exertion.

• Subjects completed two days of testing separated by at least two days time.

• Exercise Protocol:
  - Ingestion of sodium bicarbonate or placebo (sugar pill)
  - Rest period followed by measurement of HR1, BP1, and BLa1
  - Completion of 60-second Wingate test
  - Measurement of HR2, BP2, RPE, and BLa2
  - 5 minute rest period followed by measurement of HR3, BP3, and BLa3

Results (continued)

• Dependent t-tests showed no significant differences between trials (p > 0.05).

Figure 1: Heart rate, blood pressure, and lactate and rating of perceived exertion response immediately following exercise bout.

Figure 2: Heart rate, blood pressure, and lactate response 5-minute post exercise bout.

Results

• Based on the results of this study, there are no additional benefits to sodium bicarbonate supplementation on blood lactate accumulation as it relates to muscle fatigue.

• Suggestions for future studies: larger sample size, training program, and insertion of control group.

Conclusions

- Sodium bicarbonate supplementation was an effective buffer for high intensity swimming leading to increased performance for young athletes (Zajac et al., 2009).

- Previous literature suggests that supplementation could lead to a decrease in blood lactate accumulation (mmol/L), lower perceived exertion (RPE), and longer exercise duration.

- Blood lactate is the byproduct of the anaerobic metabolism of glycogen during the first five minutes of exercise.

- Sodium bicarbonate is thought to work as a buffer in the cardiovascular system.

- Sodium bicarbonate ingestion improved Judo-related performance in repeated bouts when compared to placebo (Arrioli et al., 2007).

- Sodium bicarbonate supplementation was effective for allowing high intensity swimming leading to increased performance for young athletes (Zajac et al., 2009).

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