Sodium bicarbonate and boxing – college

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Sodium Bicarbonate and Boxing Performance Boxing Is a sport which relies on anaerobic power since It contains short-duration and high Intensity work. A typical boxing match today consists of 3 minute rounds with a 1 minute seated recovery rest. When an athlete performs exercise at maximal level for more than 30 seconds, most of the energy comes from anaerobic glycolysis.

During this process, lactic acid is produced which causes a decrease in pH levels within the muscle cell.

This acidity is caused by the accumulation of extracellular ydrogen ions, and has been proposed as the contributor to skeletal muscle fatigue. It has also been linked to decrease in performance. A boxer fighting in the ring would definitely want to avoid these main limiting factors if he wants to beat his opponent and win the fight.

This is where sodium bicarbonate comes into play. According to the research article, athletes have practiced sodium bicarbonate loading for over decades. For this reason alone, sodium bicarbonate Ingestion Is something worth Investigating. Obviously, there Is a reason why people choose to ingest It.

Any athlete who could possibly reduce the negative effects exercise throws at them and make changes which would make them succeed, they will be willing to try it.

According to the article, sodium bicarbonate (NaHC03) may act as a buffering system and may have an ergogenic effect. The purpose of this study was to determine if sodium bicarbonate (NaHC03) would provide an

enhanced buffering medium during the boxing match and have a positive effect on punch efficacy. This study points out that sodium bicarbonate supplementation during boxing has not been reported in scientific Journals.

Therefore, the authors felt that it was important to see If there was an ergogenic potential of sodium bicarbonate ingestion.

It was hypothesized that sodium bicarbonate loading would buffer the extracellular hydrogen Ions produced by glycolysis and may cause two actions to occur. One, " ald In the homeostatic maintenance of glycolysis for longer periods throughout the boxing match and two, sustain calcium and reresquestering in the sarcoplasmic reticulum through increasing the strong ion difference" (page 104). If this were to occur, there would be a delay in skeletal muscle fatigue, and the athlete would see an overall performance ncrease.

The technique that was used to test their hypothesis was to collect a group of 10 boxers from an amateur boxing club in the I-JK. There were 2 competitive sparring bouts separated by 1 week that each boxer had to attend. Bouts consisted of four 3- min rounds, each separated by 1 minute seated recovery.

The boxers were paired according to current weight and boxing ability. They all had at least 7 years ?± 4 years of boxing experience and were currently In a pre-competltlon training phase. All boxers arrived at the gym 1. 5 hours before each bout to take a baseline blood sample and to consume either a 500 ml solution of 0.

kg BW of NaHCOa, or a 0. 0045g kg finger sticks. They were told to sit quietly for 1 hour following the solution ingestion. rwo Sony cameras were placed at different locations to record the bout and to record successful punches thrown. After each bout ended, another blood sample was taken to be analyzed. The dependant variables selected in this study were blood acid-base status, electrolytes, HR, RPE, and punch efficacy.

The methods which were used to test the research hypothesis were appropriate for the research question.

First, the design called for subjects which were all the pproximately at the same level of boxing experience. Also, the design made every effort possible to control potentially confounding variables such as, diet, hydration, and high intensity exercise previously performed by each boxer. This would rule out spike in positive effects of sodium bicarbonate on inexperienced people who do not usually engage in exercise. Moreover, this would give an incorrect or inconclusive reading/results had there been any concern that the variables were altered.

Thirdly, the boxers were given 1 hour prior to the bouts to allow the sodium bicarbonate olution or the placebo solution to actually take effect before they made any assumptions. Also, the Sony cameras which were set up, were able to catch every punch thrown by each boxer to determine if their performance indeed increased positively. Lastly, the blood draw before and after each bout was appropriate because the components of blood can present many things. From the moment high ntensity begins, hydrogen ions

and lactate builds up in the muscle and is then transported into the blood. The decrease in muscle pH reflects the blood PH.

The body has buffers available in the blood such as proteins, hemoglobin, and icarbonate which help stabilize the hydrogen concentration.

Thus, one of the best Nays to observe if sodium bicarbonate loading is actually regulating this hydrogen concentration is to test the blood before loading and after loading. The interpretations of the results presented in this study were reasonable. As expected, the placebo condition resulted in considerable lower buffering ability when compared to the sodium bicarbonate condition. There was nothing in the placebo solution which would present a buffering medium in the blood as the boxing rounds Nent on.

Figure 1 in the article illustrates the pH in the placebo group continuing to fall and their blood became more and more acidic, while the bicarbonate group showed ability to buffer pH in the blood pre-sparring and during post-sparring.

Nhen considering boxing performance, there were 3 important variables the research inspected. The mean heart rate (HR), rate of perceived exertion (RPE), and punch efficacy were presented in Table 3 of the article. There was no effect when looking at heart rate and RPE. However, there was a significant difference between conditions for total punch efficacy.

The table suggested that regardless of condition, the work rate of each boxer increased gradually throughout each round. Heart rate and RPE both increased more and more.

This would make sense because as the boxer is increased exertion and deliberately added more intensity to each round, his heart rate also increased. Nonetheless, punch efficacy was the only variable that showed some promise. This is most likely due to the fact that HR and RPE are two particular variables which are not related directly to blood buffering. When comparing the bicarbonate solution to the placebo solution in regards to punch

Increased punch efficacy. This would aid in the logic that perhaps, due to the blood buffering which took place inside the blood, the boxer became less acidic and was able continue longer without fatiguing as quickly. The study suggests a standard dosage of 0.

3g/kg/BW was the optimal amount an athlete should ingest before multiple high intensity exercise to see an ergogenic affect. Anything over this amount might cause GI distress and could possibly hinder performance if the athlete is not feeling well. A dose of 0. 2g/kg/BW will show some effect, but a dosage of a lesser amount will show no increased performance outcome.