



Need of Carbohydrate Consumption during Ultra-endurance Exercise.

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Glucose is the main energy substrate for muscle contraction during exercise. Carbohydrate (CHO) intake during exercise has shown to be beneficial for maintenance of normal blood glucose levels. The reduction in plasma glucose, which occurs during prolonged exercise in intensities greater than 85% of VO₂Max, is an indication that the liver and muscles cannot provide enough glucose once their glycogen stores are exhausted. Under these conditions, additional glucose may benefit performance because the principal fuel is CHO. But at intensities below that, in our hypothesis, athletes would not need to replenish CHO during exercise because lipids are the principal fuel and glucose levels may be maintained by gluconeogenesis from other sources.

Purpose

To determine that during ultra-endurance exercise the ingestion of CHO is not necessary.

Methods

Three male trained amateur runners (age average: 46 years old, body weight: 77 kg, height: 174 cm, percentage of body fat: 12 %, weekly covered distance: 160 km, training history: 6 years, VO₂max: 54 ml/kg/min) who voluntarily provided blood samples. The glucose test was done with an Accu-Chek Performa Nano® device. The duration of the study was six months. The runners ran 60-80 km on Saturday (day of the study). The intensity of the exercise was between 75-80% VO₂ max. The glucose level was measured immediately before exercise, every hour during exercise and immediately after exercise. During the test the runners did not drink any kind of CHO, they drank only water, water plus sucralose and diet juice, or chewed sugar free gum to avoid the feeling of an empty stomach.

Results

The average duration of the Saturday training session was 10 hours. The average of the glycaemia control before exercise was 104 ± 7 , during exercise it was 98 ± 3 , and after exercise it was 89 ± 3 mg/dl. The runners did not feel any physical or mental disorder during the study. The feeling of an empty stomach was not due to hypoglycemia, because when this sensation appeared we took an extra blood sample and the levels of glycaemia were not low.

Conclusions

For ultra-endurance events lasting for more than 3 hours, and with 75-80% VO₂ max intensities, it is not necessary to take any kind of CHO during exercise to maintain the blood glucose levels, because the glycemic levels are normal the whole time. However, larger and statistically stronger studies are needed to make a general recommendation to athletes.