

THE EFFECTS OF REHYDRATION WITH WATER, GLUCOSE OR GLUCOSE-POLYMER ELECTROLYTE SOLUTION DURING PROLONGED EXERCISE

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Marked water and electrolyte depletion occurs during prolonged physical exercise. This is accompanied by reduced working capacity. Thirty-four healthy men doing their military service took part in a 3 h march on a treadmill in full combat gear. The men had 10 minutes' rest every 50 min. The effects of rehydration with water, a commercial sport beverage containing 5% glucose and an experimental drink containing 3% maltodextrin and 70 mmol/l sodium salts were studied. Control group (8 men) did not drink anything. The drinks were given every 15 min ad libitum (0.4 - 2.3 l). Here are presented some preliminary results of the study. The mean body weight loss during the exercise was 2.3 ± 0.1 kg and the mean rectal temperature at the end of exercise was 38.6 ± 0.07 °C. The increase in the heart rate correlated with the rectal temperature at the end of exercise ($r = 0.41$, $p < 0.02$), but not with the degree of water deficit. The serum concentrations of free fatty acids, creatinine, urea, phosphate and sodium increased significantly during the exercise. There were no differences between the groups in the changes in rectal temperature, weight loss or heart rate. Three men in the control group could not complete their exercise task due to exhaustion. The serum level of free fatty acids increased significantly less during the exercise in the glucose solution substitute group than in the glucose - polymer solution substitute group.

In conclusion: Marked dehydration occurs during prolonged physical exercise if fluid is ingested according to the sensation of thirst. However, even small amounts of fluid may postpone the onset of exhaustion during prolonged exercise. The lipolysis may be inhibited after ingestion of glucose containing drinks leading to greater dependence on carbohydrates in energy production.