

Comparative effects of selected rehydration sports drinks on short-term performance following moderate dehydration

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Abstract

The effect of moderate dehydration and consequent fluid replenishment on short-duration maximal treadmill performance was studied in eight healthy, fit ($VO_{2max} = 49.7 \pm 8.7 \text{ mL kg}^{-1} \text{ min}^{-1}$) males aged 28 ± 7.5 yrs. Initially, each subject performed a baseline exercise test using an individualized treadmill protocol structured to induce exhaustion in 6 to 10 min. On each of the three subsequent testing days, the subjects exercised at 70-75% VO_{2max} for 60 min at 29-33° C, resulting in a dehydration of 1.8-3.1% body weight. After 60 min of rest, and prior to fluid replenishment, subjects performed the same treadmill test, which resulted in a small reduction in VO_{2max} and a decline in treadmill performance by 3%. Following another 60 min rest, subjects ingested the same amount of fluid lost in the form of one of three commercial drinks, namely Crystal Light, Gatorade® and Rehydrate, and then repeated the treadmill test. VO_{2max} returned to baseline levels with Rehydrate, while there was only a slight improvement with Gatorade and Crystal Light. There were no changes in other physiological measures. Relative to the dehydrated state, a marked reduction in treadmill performance time occurred with Crystal Light, while replenishment with Gatorade, which contains fructose, sodium and potassium, elicited a slight decrease. In contrast, treatment with Rehydrate, which comprises fructose, glucose polymer, magnesium, sodium, potassium, calcium, amino acids and vitamins, resulted in a significant increase in this objective measure. The results demonstrated that constituents other than simple transportable monosaccharides and sodium are important for maximal exercise performance and effective recovery associated with exercise-induced dehydration.

Key words Rehydrate · Gatorade · VO_{2max} · Mitochondria · Rehydration/electrolytes · L-Glutamine · Dehydration/exercise · Crystal Light · Treadmill performance · Heart rate · Ventilation