Performance benefits of rehydration with intravenous fluid and oral glycerol.

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Abstract

Purpose

Intravenous (IV) saline has been used by athletes attempting to accelerate rehydration procedures. The diuresis from IV rehydration may be circumvented through the concomitant use of oral glycerol. We aimed to examine the effects of rehydrating with four different regimens of IV fluid and oral glycerol on subsequent 40-km cycling time trial performance.

Methods

Nine endurance-trained men were dehydrated by 4% bodyweight via exercise in the heat. They then rehydrated with 150% of the fluid lost via four protocols using a randomized crossover design: 1) oral = sports drink and water; 2) oral glycerol = sports drink, water, and glycerol; 3) IV = half as normal saline, half of sports drink, and water; and 4) IV with oral glycerol = half as normal saline, half as sports drink, water, and glycerol. After this, they completed a 40-km cycling performance test in the heat.

Results

Compared with oral rehydration, there were significant performance benefits (P < 0.05) when rehydrating with oral glycerol (improved time to complete 40 km by 3.7%), IV (3.5%), and IV with oral glycerol (4.1%). Plasma volume restoration was highest in IV with oral glycerol, then IV, then oral glycerol, then oral (P < 0.01 for all of these comparisons). There were no differences in HR, tympanic/skin temperatures, sweat rate, blood lactate concentration, thermal stress, or RPE between groups.

Conclusions

Combining IV fluid with oral glycerol resulted in the greatest fluid retention; however, it did not improve exercise performance compared with either modality alone.

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References

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