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Title: Fluid and cation changes during head-out immersions in 25 degrees and 35 degrees C water

Authors: Deuster, PA
Doubt, TJ
Ryan, CJ
Montgomery, LC
Haberman, KJ

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Abstract: To compare fluid and ion changes during cold (25 degrees C) and thermoneutral head-out immersion (HOI) 9 men were studied under 4 resting conditions lasting 3 h: 2 in 35 degrees C and 2 in 25 degrees C water. At each temperature, subjects consumed 250 ml of either water or a 7% glucose polymer solution every hour to evaluate possible differences in fluid composition. Plasma volume increased by 3.9% for 35 degrees C and decreased by 9.7% for 25 degrees C HOI after 3 h. Urine flow increased significantly during HOI, but there were no differences between water temperatures (35 degrees C: 8.37 +/- 0.44; 25 degrees C: 9.55 +/- 0.57 ml.min⁻¹). Free water clearance and urinary sodium excretion were also elevated during HOI, but water temperature did not alter the magnitude of the response. No HOI-induced kaliuresis was noted. Finally, there was a significant cold-induced increase in serum potassium and sodium, but this reflected largely the decrease in plasma volume. In sum, differences in water temperature seemed to have minimal influence on fluid and cation changes, an indication that immersion is the primary stimulus. Whether greater differences would be noted with colder water remains to be determined.

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