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Title: Failure to reduce body water loss in cold-water immersion by glycerol ingestion

Authors: Arnall, DA
Goforth Jr, HW

Keywords: immersion
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Abstract: The efficacy of ingesting an aqueous glycerol solution to enhance body water retention during prolonged cold-water dives was evaluated. Nine Naval Special Warfare divers performed a 3-h dive in 13 degrees C water. Divers were assigned to either a water-treatment group (WT) or a glycerol-treatment (GT) group. WT ingested 30 ml water/kg lean body mass (LBM). GT ingested a solution consisting of 1.2 ml glycerol/kg LBM and 30 ml water/kg LBM. Blood was drawn at prehydration, 90 min after hydration, and 20 min after the 3-h dive for serum glycerol, glucose, free fatty acids, lactate, and electrolyte determinations. Fluid intake and output was recorded and urine analyzed for osmolality, electrolytes, and specific gravity. Serum glycerol values in GT were 200 times greater at posthydration than prehydration and 100 times greater at postdive than at prehydration. Urine output, total body weight loss, and non-urine weight loss during posthydration and dive sampling periods were not significantly different between treatment groups. Hyperhydration with an aqueous glycerol solution of 1.2 ml glycerol/kg LBM seems ineffective in significantly reducing body water loss in divers during prolonged cold-water immersion.

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