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The effect of desmopressin, a vasopressin analog, on endurance performance during a prolonged run in simulated heat conditions.

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Arginine vasopressin (AVP) release into the bloodstream is essential for water balance in the body and, thus, for core-temperature regulation. We investigated the effect of the AVP analog desmopressin (Des) on the performance of 6 endurance runners in a simulated heat condition. Four strenuous treadmill runs were performed at a 1-week interval. Over the 4 test sessions, room temperature and relative humidity were 22 +/- 0.4 degrees C and 47% +/- 7%, respectively. Each run included 40 min at 60% maximal aerobic velocity immediately followed by an incremental run until exhaustion.

Dehydration and hyperthermia were induced by wearing an impermeable tracksuit. Two runs were performed with no hydration (NH; NH-Des) and two under false hydration (FH; FH-Des). Under FH conditions, the runner was given a set amount of water every 5 min of the run, which was kept in the mouth for 10 s and spat out. Under NH-Des and FH-Des conditions, the run was performed 60 min after a 30 microg intranasal administration of desmopressin. In the NH-Des trial, the total distance run was 5%-8% longer than in the other conditions ($p < 0.05$). This was associated with a lower heart rate after the 40 min run than occurred in the NH and FH trials ($p < 0.01$) and a lower tympanic temperature than in the FH trial ($p < 0.05$). Urine mass was also lower under NH-Des conditions than under NH and FH conditions ($p < 0.05$). It is suggested that desmopressin administration could improve dramatically prolonged running performances in a hot and humid environment.

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