and metabolic system and should not be recommended for physically untrained persons, especially during hot conditions. Despite the fact that this case only investigated 1 volunteer and 1 hike, this letter may help to highlight further research needs regarding the responses to desert hiking. These include: (1) nutrition; (2) clothing and equipment; and (3) physical fitness preparation for desert hiking.

Billy Sperlich, PhD
Matthias Haegele
Marcus de Marées, MD
Joachim Mester, PhD
Cologne, Germany

John Linville, MPH, CPH
Omaha, NE, USA

References

1. National Park Service. <http://www.nps.gov/grca/planyourvisit/backcountry.htm> Accessed: September 2009.
2. Weir JB. New methods for calculating metabolic rate with special reference to protein metabolism. *J Physiol.* 1949; 109:1–9.
3. Cunningham JJ. Body composition as a determinant of energy expenditure: a synthetic review and a proposed general prediction equation. *Am J Clin Nutr.* 1991;54:963–969.
4. American College of Sports Medicine Position Stand. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness, and flexibility in healthy adults. *Med Sci Sports Exerc.* 1998;30:975–991.
5. Brooks GA, Mercier J. Balance of carbohydrate and lipid utilization during exercise: the “crossover” concept. *J Appl Physiol.* 1994;76:2253–2261.
6. Bartscher M, Bachmann O, Hatzl T, et al. Cardiopulmonary and metabolic responses in healthy elderly humans during a 1-week hiking programme at high altitude. *Eur J Appl Physiol.* 2001;84:379–386.
7. Bassett DR Jr, Howley ET. Limiting factors for maximum oxygen uptake and determinants of endurance performance. *Med Sci Sports Exerc.* 2000;32:70–84.
8. Costill DL, Winrow E. Maximal oxygen intake among marathon runners. *Arch Phys Med Rehabil.* 1970;51:317–320.

Medicinal Alcohol for Exercise-Associated Hyponatremia?

To the Editor:

I read with interest the article by Rogers and Hew-Butler concerning exercise-associated hyponatremia.¹ While one might dispute whether it constitutes “the most important medical problem of endurance exercise,” exercise-associated hyponatremia clearly presents a serious

diagnostic and treatment challenge, particularly in the wilderness environment. Front-line treatment consists of hypertonic saline infusion, yet this may not be readily available or easily administered in all field conditions. Similar limitations apply to the monitoring of serum sodium deemed necessary to manage this treatment.^{1,2} Also, hypertonic saline administration carries risk of complications nearly as severe as hyponatremia.²

These authors and others^{1–3} note that inappropriately excessive arginine vasopressin (AVP, also known as antidiuretic hormone or ADH) secretion contributes significantly to the pathophysiology of exercise-induced hyponatremia by limiting aquaresis. Alcohol (ethanol) is a well-established and potent inhibitor of AVP secretion, and circulating AVP is rapidly catabolized.^{4,5} Therefore, I write primarily to hypothesize that oral ethanol consumption may provide a hyponatremia treatment alternative worth investigation. Due to the necessity of limiting water intake with hyponatremia, hard liquor (~40% ethanol) offers the most medically logical mode of administration. A moderate dose may prove effective (0.5 mL ethanol per kg body weight, or about 2–3 shots of 80 proof liquor), yet only research confirms such matters. The need for sodium intake suggests tequila shots with the customary salt and citrus. The idea offers several advantages: hard liquor is often brought along for recreational purposes even in remote situations, oral consumption requires no intravenous line, moderate oral ethanol imposes no risks comparable to those of intravenous hypertonic saline, and serum sodium monitoring to avoid overcorrection of hyponatremia becomes much less important.

As long as it is not overzealous, ethanol consumption may deserve investigation as a treatment alternative for exercise-associated hyponatremia.

Donald E. Watenpaugh, PhD
University of North Texas Health Science Center
Fort Worth, TX, USA

References

1. Rogers IR, Hew-Butler T. Exercise-associated hyponatremia: overzealous fluid consumption. *Wilderness Environ Med.* 2009;20:139–143.
2. Sterns RH, Nigwekar SU, Hix JK. The treatment of hyponatremia. *Semin Nephrol.* 2009;29:282–299.
3. Rosner MH. Exercise-associated hyponatremia. *Semin Nephrol.* 2009;29:271–281.
4. Kalant H. Direct effects of ethanol on the nervous system. *Fed Proc.* 1975;34:1930–1941.
5. Wright J. Endocrine effects of alcohol. *Clin Endocrinol Metab.* 1978;7:351–367.