

The Best Way to Prevent and Treat Heatstroke in Long-Distance Runners is to Avoid Running or Only Run in Cold Climates

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LETTER TO THE EDITOR

We read with interest the article by Doolee, *et al.* on the incidence, prevention, treatment and outcome of exertional heat stroke (EHS) in 374534 runners [Dollée, N. *et al.*, 2024]. A tympanic temperature of 40°C was measured in 48 of these runners, and 36 of them were classified as having EHS due to the presence of neurological symptoms [Dollée, N. *et al.*, 2024]. All patients cooled by rotating towels soaked in ice water reached temperatures <40°C within half an hour [Dollée, N. *et al.*, 2024]. The average cooling rate was 0.12°C per minute [Dollée, N. *et al.*, 2024]. It was concluded that rotating towels soaked in ice water could be an effective and practical method of prehospital cooling [Dollée, N. *et al.*, 2024]. The study is noteworthy, but some points should be discussed.

The first point is that the prevention and treatment of EHS can be achieved not only by cooling but also by various other measures. These include drinking fluids (staying hydrated), hydrating and fanning, and acclimatization [Walter, E. *et al.*, 2018]. For runners coming from cool climates, it should be mandatory to acclimatize before running in a climate to which they are not accustomed. Organizers of long distance races should also be encouraged to hold such events in hot climates in the morning or, if possible, after sunset. Organizers should provide plenty of free fluids during the race. The route should be chosen to include as many shaded sections as possible. A cap and light clothing should be mandatory to avoid EHS.

The second point is that runners with risk factors for EHS should be excluded from competitions. Risk factors for EHS include obesity (body mass index ≥ 30 kg/m²), diabetes, arterial hypertension, heart disease, low physical fitness, and regular use of medications such as diuretics, some

psychotropic drugs, some blood pressure medications, medications that prevent sweating and medications that cause one to not feel heat exhaustion, chronic alcohol consumption, and use of illicit drugs such as opioids, methamphetamine, or cocaine [Garcia, C. K. *et al.*, 2022].

The third issue is that the criteria by which heat stroke was diagnosed were not specified. Knowing the exact definition of EHS is crucial, as different definitions can lead to different outcomes. EHS is usually defined as a life-threatening multisystem disorder characterized by central nervous system (CNS) dysfunction (encephalopathy) and additional organ and tissue damage (e.g., acute kidney damage, liver damage, rhabdomyolysis) associated with high body temperatures [Binkley, H. M. *et al.*, 2002].

The fourth point is that organizers must inform participants of the symptoms and signs of EHS before the event so that each participant can recognize when he or she needs to stop and cool down. Symptoms of EHS include thirst, sweating, headache, nausea, loss of appetite, muscle cramps, lightheadedness, tunnel vision, diarrhea, decreased urine production, urge to defecate, paleness, chills and fatigue. Signs of EHS include dehydration, fatigue, pale or sweaty skin, decreased pulse rate, dizziness, hyperventilation, drowsiness, irrational behavior, confusion, irritability, emotional instability, hysteria, apathy, aggressiveness, delirium, disorientation, fainting, staggering, unconsciousness, muscle weakness, hyponatremia, lethargy, pulmonary edema, cerebral edema, seizures or coma [Binkley, H. M. *et al.*, 2002; Morris, A. *et al.*, 2025].

In summary, this interesting study has limitations that put the results and their interpretation into perspective. Addressing these limitations could strengthen the conclusions and corroborate the

study's message. To prevent heat stroke, it is essential to exclude people with risk factors from running, to acclimatize, to hydrate adequately, to run with sun protection and to avoid long runs in hot and humid climates. The best prevention and treatment of heat stroke in long distance runners is to avoid running or only run in cold climates.

REFERENCES

1. Dollée, N., Alsma, J., Goedhart, R., Bultstra, A., Haagsma, J. A. & Hoek, A. E. "Exertional heat stroke: Are we cool enough? Retrospective observational study of patients of running events." *Journal of Emergency Medicine*, (2024): S0736-4679(24)00354-8.
2. Walter, E. & Steel, K. "Management of exertional heat stroke: A practical update for primary care physicians." *British Journal of General Practice*, 68.668 (2018): 153–154.
3. Garcia, C. K., Renteria, L. I., Leite-Santos, G., Leon, L. R. & Laitano, O. "Exertional heat stroke: Pathophysiology and risk factors." *BMJ Medicine*, 1 (2022): e000239.
4. Binkley, H. M., Beckett, J., Casa, D. J., Kleiner, D. M. & Plummer, P. E. "National Athletic Trainers' Association position statement: Exertional heat illnesses." *Journal of Athletic Training*, 37.3 (2002): 329–343.
5. Morris, A. & Patel, G. "Heat stroke." [Updated 2023 Feb 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK537135/>.

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