EM:RAP

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September Introduction

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Case: EMS calls with a man in his 30s who is altered. He has no past medical history. A friend called EMS for what looked like seizure activity. On arrival, he is tachycardic to the 180s with a blood pressure of 70/40 mmHg, O_2 sat 99% on non rebreather, and fingerstick blood sugar of 121 mg/dL (6.7 mmol/L). The initial ECG looks like AVNRT (AV nodal reentrant tachycardia) so electrical cardioversion is attempted twice at 150 J and 200 J without resolution. At this point, a rectal temperature is obtained and it reads 106.5° F (41.4° C).

- Initial Management
  - Evaporative cooling is the most effective and practical cooling method in the hospital setting.
  - Cooling is the most important step in the management of heat stroke. It must be started immediately and be completed rapidly to avoid significant damage to the brain.
  - The fastest way to cool a patient is with ice water immersion. Place the patient in a body bag or tarp and fill it with ice and water.
  - The goal is to rapidly drop the temperature (within 20-30 minutes - but can be achieved much more rapidly).
  - Remove the patient from the ice bath when the core temp hits 101.0° F (38.3° C) to avoid overshooting.
    - *Ed. note: There are minor discrepancies in published recommendations regarding the optimal target temperature at which to stop cooling measures. Most guidelines recommend a cessation of active cooling measures at a temperature of 38°C (100.4°F) for evaporative cooling, and 39°C (102.2°F) when immersive cooling is used.*
    - Consider benzodiazepines for agitation as well as to prevent shivering, which can generate more heat.
- Occasionally, there will be a clear history of environmental exposure causing heat stroke (i.e physical exertion or being trapped in a hot environment), but it's often not clear. It can be difficult to determine if there is an alternate cause, like sepsis.

PITFALLS ◆

- Other causes of altered mental status and elevated core temperature should be considered and ruled out, especially where etiology is unclear.

- Differential Diagnosis
  - Sepsis
  - Sympathomimetic intoxication (sweating usually present)
  - Anticholinergic intoxication (sweating absent)
  - Sedative-hypnotic withdrawal
  - Serotonin toxicity
  - Malignant hyperthermia
  - Neuroleptic malignant syndrome
  - Severe decompensated hyperthyroidism (ie, thyroid storm)
- Case resolution: The patient was covered with broad spectrum antibiotics, intubated for aspiration risk, and admitted to the medical intensive care unit (MICU).

Related Links
EM:RAP 2019 June: Heat Stroke

CorePendium Chapter: Heat-Related Emergencies