Rapid Cooling via Ice-Water Immersion for Severe Drug-Induced Hyperthermia (137)

Larissa Laskowski, DO
Medical Toxicology Fellow
NYC Poison Control Center
EAPCCT 2015
Learning Objectives

1. To interpret the literature on convective vs. conductive cooling to treat patients with hyperthermia
2. To evaluate two cases of severe drug-induced hyperthermia that were rapidly cooled via ice-water immersion
3. To describe the key principles of cooling a patient using an ice-water immersion technique
Question: True or False?

Establishing a definitive airway and IV access are necessary prior to initiating cooling of a patient with drug-induced hyperthermia.
Drug-Induced Hyperthermia

Temperature > 40°C (104°F):
+ altered mental status
+ toxicologic etiology
Convective vs Conductive

Weiner (1980)
• 0.3°C/min

Khogali (1980)
• 0.046°C/min

Poulton (1987)
• 0.104°C/min

Armstrong (1996)
• 0.2°C/min

Proulx (2003)
• 0.19°C/min (8°C)
• 0.35°C/min (2°C)
Case 1:

27 yo man PMH polysubstance use found agitated on street

VS: 144/96 mm Hg 180/min  20/min  99% (RA)
FS < 2.5 mmol/L (< 46 mg/dL)  41.4°C (106.5°F)
Medications:
Dextrose IV
Midazolam IV

Interventions:
Ice-water immersion
Sedation
Case 1: Temperature Curve

0.18°C/min
Case 2:

32 yo man agitated after cocaine use was transported to ED in body bag

VS: 216/142 mm Hg 176/min 38/min
FS 10 mmol/L (183 mg/dL) 44.4°C (112°F)
Medications:
- Diazepam IV
- Succinylcholine IV

Interventions:
- Sedation
- Intubation
- Ice-water immersion
Case 2: Temperature Curve

$0.28^\circ C/min$
Ice-Water Immersion: Key Principles
Rapid Identification

Core Temperature
Initiate COOLING
Midazolam Injection, USP

50 mg/10 mL

10 mL Vial

(5 mg/mL)

midazolam (as the hydrochloride)

FOR IM OR IV USE ONLY
CONTAINS BENZYL ALCOHOL
Avoid Overshoot

39°C
(102.2°F)
Question: True or False?

Establishing a definitive airway and IV access are necessary prior to initiating cooling of the patient with drug-induced hyperthermia.  

False
Acknowledgements

- Dr. Adaira Landry
- Dr. Susi Vassallo
- Dr. Robert Hoffman