

Ouachita Baptist University

Scholarly Commons @ Ouachita

Scholars Day Conference

Scholars Day 2024

Apr 24th, 3:15 PM - 4:30 PM

The Effects of Evaporative Cooling Techniques in Comparison to Water Immersion Techniques in Reducing Infant Vehicular Hyperthermia Mortality Rates

Mary O'Sullivan

Ouachita Baptist University

Katelyn Lu

Ouachita Baptist University

Ella Ragar

Ouachita Baptist University

Kylie Carpenter

Ouachita Baptist University

Follow this and additional works at: https://scholarlycommons.obu.edu/scholars_day_conference

O'Sullivan, Mary; Lu, Katelyn; Ragar, Ella; and Carpenter, Kylie, "The Effects of Evaporative Cooling Techniques in Comparison to Water Immersion Techniques in Reducing Infant Vehicular Hyperthermia Mortality Rates" (2024). *Scholars Day Conference*. 22.

https://scholarlycommons.obu.edu/scholars_day_conference/2024/posters/22

This Poster is brought to you for free and open access by the Carl Goodson Honors Program at Scholarly Commons @ Ouachita. It has been accepted for inclusion in Scholars Day Conference by an authorized administrator of Scholarly Commons @ Ouachita. For more information, please contact mortensona@obu.edu.

AUTHORS

Kylie Carpenter, Katelyn Lu,
Mary O'Sullivan, Ella Ragar,
Carol Carter, Phd, BSN, RN

Evaluating Interventions for Infant Vehicular Hyperthermia



In infants facing vehicular hyperthermia, what is the effect of evaporating cooling techniques in comparison to water immersion techniques in reducing infant mortality rates?

Objective

According to the National Security Council (2024), in the United States there is an average of 38 children under the age of 15 that die each year from vehicular hyperthermia. Vehicular hyperthermia is exposure to prolonged heat causing the core body temperature to rise above dangerous levels. This situation can arise from caregiver neglect by leaving a child inside the vehicle. The objective of this literature review was to find evidence to support best practice interventions to treat vehicular hyperthermia. The research question is: *In infants facing vehicular hyperthermia, what is the effect of evaporating cooling techniques in comparison to water immersion techniques in reducing infant mortality rates?*

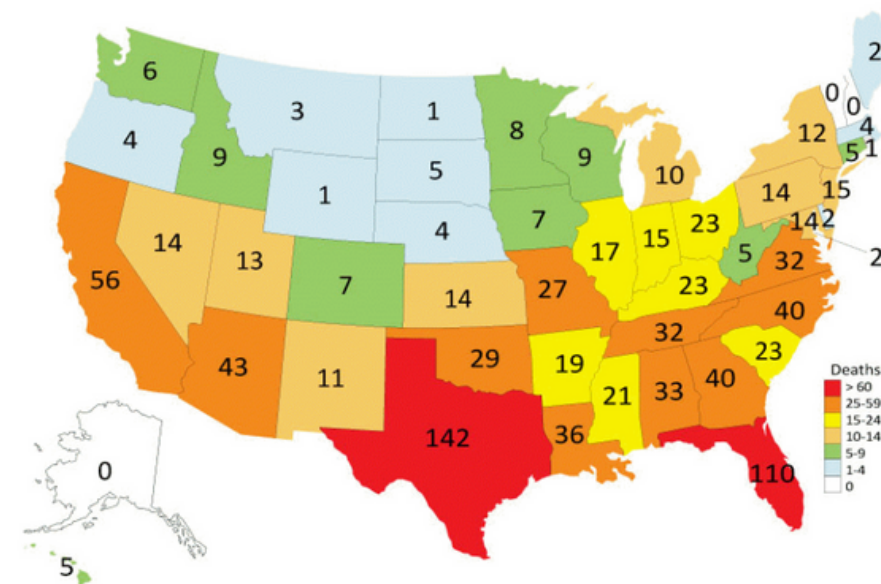
Methodology

A literature review was conducted utilizing Google Scholar and ProQuest databases. A Boolean search method was used with the word "AND" for the following *keywords*: hyperthermia, pediatrics, hot car death, heat stroke, evaporating cooling, and water immersion. The search was extended from the past 5 years to 10 years due to limited research. The articles were narrowed down based on the highest levels of evidence.

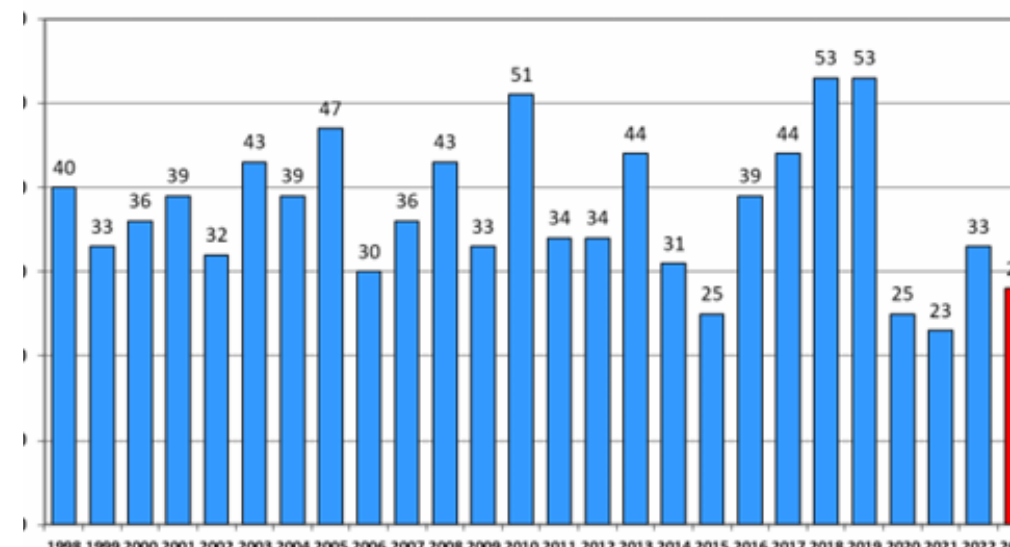
Results

Four articles were selected for review including a meta-analysis and three literature review articles. The meta-analysis and one of the literature review articles support that water immersion techniques were effective in cooling an adult's body temperature. Water immersion technique is defined as emerging the whole body in cold water until a safe core body temperature is restored. Two of the literature reviews supported evaporative cooling techniques to be effective for the hyperthermic pediatric population. Evaporating cooling technique is defined as spraying cool water on the patient's skin as warm air is fanned over the body, causing the water to evaporate and the skin to cool down. All of the literature reviews were conducted by medical doctors in Emergency Medicine.

Pediatric Vehicular Deaths by State (1998-2023)



US Pediatric Vehicular Heatstroke Deaths



Conclusion

Upon evaluation of the two interventions, the meta-analysis and one literature review article suggested that water immersion techniques were an effective way to lower body temperature in the adult population. Two of the literature review articles suggest that evaporative cooling techniques are safer in the infant population. Due to infants and their greater body surface area related to body mass, evaporative cooling techniques support being the safest intervention of the two to lower infant core body temperature.

Water immersion technique is considered the golden standard for lowering body temperature. However, water immersion can increase shivering and pose a hypothermia risk to vulnerable infants. Further research should be conducted to determine the safest and most effective intervention for lowering an infant's body temperature and reducing mortality rates.

References

