

## Therapeutic hypothermia: Myths and controversies

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The use of therapeutic hypothermia (TH) in critical care medicine is no longer a rarity. (1-3) This technique is no longer an urban myth. A variety of robust clinical trials have documented the advantages of using this therapeutic modality in comatose victims of cardiac arrest with successful return of spontaneous circulation (ROSC). (4,5) TH has many potential applications other than cardiac arrest victims with ROSC and coma. (1,6) Data is available for a variety of critical conditions. Current data clearly indicates that TH protects the cells against the aggressors in hypoxic or anoxic events (not only cardiac-related). (6) TH can protect the microvasculature, reducing the expression of reactive oxygen species; inhibiting adhesion, activation, and accumulation of neutrophils, preserving the adenosine triphosphate storages and maintaining an aerobic metabolism. (1,6)

A recent, and controversial, clinical trial compared TH to 33°C versus temperature control to 36°C in victims of cardiac arrest showing no survival or neurological advantages. (7) Following the publication of this article, several news media sources contacted one of the authors of this editorial regarding such article becoming a “game changer” in the area of TH. We strongly believe this recent publication IS NOT a game changer and it does not represent the body of clinical research in the area of TH. In addition, this study is methodologically flawed with the ensuing potential bias. For example, the rate of rewarming in those patients that underwent TH in that trial

was much faster than any clinical published trial to date. That is a significant concern, as rapid rewarming can cause more damage and negate the beneficial effects of TH. (8) Therefore, some of the study endpoints have caused more controversy than answered a clinical question.

Several areas of concern arise when a study such as the one conducted by Nielsen and coworkers is published in a large peer-reviewed journal that has wide access to news sources. (7) First, clinicians not experienced in the specific study area are likely to “believe everything they read”. Second, the associated letters to the editor that will be published in the weeks to follow are rarely read by those who initially read the primary paper. Third, many will consider such trials as “authoritative”.

TH has gained a spot among the arsenal of therapeutic techniques available for the emergency and critical care physicians. The use of this method is finally starting to gain popularity and the expansion of its accepted indications is the next step. Considering the importance of how temperature before and after an injury critically participates in neuronal damage that is irreversible, and in its subsequent dysfunctions, larger randomized clinical trials with “clean” methodologies are necessary. When contemplating the use of TH, the responsible physician needs to consider the patients complete medical history and clinical presentation, previous published data in large peer-reviewed journals, case series, and more importantly his/her clinical experience with this life-saving technique.

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