Response to Letter Regarding Article, “The Utility of Therapeutic Hypothermia for Post–Cardiac Arrest Syndrome Patients With an Initial Nonshockable Rhythm”

Thank you for the opportunity to respond to Dr Chan’s insightful comments regarding our article, “The Utility of Therapeutic Hypothermia for Post–Cardiac Arrest Syndrome Patients With an Initial Nonshockable Rhythm.” In this article, we used propensity score matching in a quasi-experimental design to mimic a randomized, controlled trial. Propensity score analyses have been both promoted and criticized in the literature, with a known limitation being the impact of unmeasured variables; however, there have been no published randomized trials of targeted temperature management versus no temperature management for patients with initial nonshockable rhythms because of various barriers. Our analysis, which included 519 patients with an initial nonshockable rhythm from the Penn Alliance for Therapeutic Hypothermia (PATH) Registry between 2000 and 2013, was an achievable, alternative approach, offering some insights on this important question.

Dr Chan raises concern that the variables included in our derivation of a propensity score did not reflect patients’ severity of illness and did not account for date (year) of the arrest and hospital location, because cardiac arrest outcomes have improved over time and variability in hospital performance has been observed. He also suggested that a much larger cohort would have been helpful. In deriving our propensity score, we applied the findings of Lindner et al., who determined that age, sex, initial rhythm, witnessed arrest, duration of arrest, and location of arrest all contribute to an individual’s propensity to receive therapeutic hypothermia. In addition, to perform this quasi-experimental analysis, our untreated cohort included a larger number of patients from the early years of data collection, when hypothermia was underused, and patients who were potential candidates for therapy did not receive it. To address Dr Chan’s concerns, we recalculated our propensity score to include both year of arrest and treating hospital. We determined the odds ratios for good neurological outcome and for survival to hospital discharge to be 2.36 (95% confidence interval, 1.31–4.27) and 2.23 (95% confidence interval, 1.35–3.71), respectively. To further explore the timing phenomenon, we applied the previously described propensity score derivation to the subset of patients who were treated after 2007 and found similar results for good neurological outcome and survival to hospital discharge (odds ratios, 2.66; 95% confidence interval, 1.44–4.91 and odds ratios, 2.40; 95% confidence interval, 1.41–4.06, respectively). Incorporating the 2 variables suggested by Dr Chan into a more robust propensity score confirms our published findings and strengthens the results.

In response to Dr Chan’s comment calling for a repeat study in a larger cohort using a more robust propensity score, we agree and hope that the recommendations from the recent Institute of Medicine report calling for a national registry on cardiac arrest might allow for such an analysis. In addition, Lascarrou and colleagues recently published the study protocol for Therapeutic hypothermia after nonshockable cardiac arrest: the HYPERION multicenter, randomized, controlled, assessor-blinded, superiority trial, a multicenter trial in which 543 patients successfully resuscitated from nonshockable cardiac arrest will be randomly assigned to therapeutic hypothermia versus therapeutic normothermia. We eagerly await the results of this ambitious multicenter trial.

Disclosures

None.

References


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