ORIGINAL ARTICLE

Targeted Temperature Management for Cardiac Arrest with Nonshockable Rhythm

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ABSTRACT

BACKGROUND

Moderate therapeutic hypothermia is currently recommended to improve neurologic outcomes in adults with persistent coma after resuscitated out-of-hospital cardiac arrest. However, the effectiveness of moderate therapeutic hypothermia in patients with nonshockable rhythms (asystole or pulseless electrical activity) is debated.

METHODS

We performed an open-label, randomized, controlled trial comparing moderate therapeutic hypothermia (33°C during the first 24 hours) with targeted normothermia (37°C) in patients with coma who had been admitted to the intensive care unit (ICU) after resuscitation from cardiac arrest with nonshockable rhythm. The primary outcome was survival with a favorable neurologic outcome, assessed on day 90 after randomization with the use of the Cerebral Performance Category (CPC) scale (which ranges from 1 to 5, with higher scores indicating greater disability). We defined a favorable neurologic outcome as a CPC score of 1 or 2. Outcome assessment was blinded. Mortality and safety were also assessed.

RESULTS

From January 2014 through January 2018, a total of 584 patients from 25 ICUs underwent randomization, and 581 were included in the analysis (3 patients withdrew consent). On day 90, a total of 29 of 284 patients (10.2%) in the hypothermia group were alive with a CPC score of 1 or 2, as compared with 17 of 297 (5.7%) in the normothermia group (difference, 4.5 percentage points; 95% confidence interval [CI], 0.1 to 8.9; P=0.04). Mortality at 90 days did not differ significantly between the hypothermia group and the normothermia group (81.3% and 83.2%, respectively; difference, –1.9 percentage points; 95% CI, –8.0 to 4.3). The incidence of prespecified adverse events did not differ significantly between groups.

CONCLUSIONS

Among patients with coma who had been resuscitated from cardiac arrest with nonshockable rhythm, moderate therapeutic hypothermia at 33°C for 24 hours led to a higher percentage of patients who survived with a favorable neurologic outcome at day 90 than was observed with targeted normothermia. (Funded by the French Ministry of Health and others; HYPERION ClinicalTrials.gov number, NCT01994772.)

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*Lists of the investigators in the HYPERION trial and the members of the Clinical Research in Intensive Care and Sepsis (CRICS) Group are provided in the Supplementary Appendix, available at NEJM.org.

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