

Hypothermia vs Normothermia in Out-of-Hospital Cardiac Arrest



Temperature control in managing post-anoxic brain injury remains debated. The Hypothermia versus Normothermia after Out-of-Hospital Cardiac Arrest (TTM-2) trial showed no improvement in mortality or functional outcomes with therapeutic hypothermia at 33 °C in unconscious out-of-hospital cardiac arrest (OHCA) patients, compared to early fever avoidance (keeping the core temperature under 37.8 °C). Current guidelines now advocate for fever prevention for at least 72 hours in such patients but do not strongly endorse hypothermia for specific subgroups due to insufficient evidence.

In patients initially presenting with a shockable rhythm, TTM-2 did not find benefits of hypothermia at 33 °C, despite these patients generally having better prognoses. However, the Hypothermia after Cardiac Arrest (HACA) trial showed that patients with witnessed OHCA and shockable rhythms who received hypothermia at 33 °C had better neurological outcomes. Similar findings were reported in another trial involving pre-hospital cooling. Swedish registry data also found no significant survival benefit with 33 °C hypothermia versus 36 °C across all OHCA cases, but a subgroup analysis of patients like those in HACA suggested improved survival with 33 °C.

A secondary analysis of TTM-2 was conducted to further investigate the effects of hypothermia on mortality and functional outcomes in patients resembling the HACA trial cohort.

This post hoc analysis focused on a subset of patients with characteristics similar to those in a prior randomised trial. Patients were randomised to either hypothermia at 33 °C or normothermia (target < 37.8 °C). The primary outcome assessed was 6-month survival, while secondary outcomes included favourable functional outcomes at 6 months (modified Rankin scale of 0–3). Time-to-death and adverse events were also analysed.

In the TTM-2 study analysis, 600 of the 1891 participants (31.7%) were analysed, with 294 in the hypothermia group and 306 in the normothermia group. After six months, survival rates were similar: 70.4% in the hypothermia group and 71.8% in the normothermia group. Favourable functional outcomes were also comparable, with 67.3% in the hypothermia group and 66.0% in the normothermia group. However, arrhythmias were significantly more frequent in the hypothermia group (21.2%) than in the normothermia group (14.1%).

In this secondary analysis, hypothermia at 33 °C did not improve survival or functional outcomes at 6 months for OHCA patients with an initial shockable rhythm, despite findings from earlier studies suggesting benefits. Recent improvements in cardiac arrest management, such as higher rates of bystander CPR and enhanced post-resuscitation care, may have reduced the relative advantages of hypothermia, as fever was effectively prevented in normothermic patients.

Differences from past studies may stem from evolving emergency response standards and more advanced intensive care practices, which have improved survival and functional outcomes even without hypothermia. Further, the TTM-2 trial had a larger sample size, better methodological rigour, and improved cooling devices, strengthening the reliability of its findings compared to smaller, less methodologically robust prior studies. Nevertheless, study limitations include variability in interventions like sedation and ventilation and regional differences in ICU systems. These factors underscore the challenge of standardising temperature management recommendations across different clinical settings.

Source: [Critical Care](#)
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