

Does Targeted Temperature Management Improve Hospital Survival For Drug-Overdose Related Cardiac Arrest?

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Background: Drug overdose is a leading cause of out-of-hospital cardiac arrest (OHCA) among young adults. There is limited data regarding the efficacy of targeted temperature management (TTM) in this population.

Research Question: In Emergency Department (ED) patients, does TTM improve hospital survival from overdose-related cardiac arrest?

Methods: We performed a retrospective chart review of consecutive cardiac arrests presenting to an urban tertiary care hospital ED from 2011-15. Based on prior literature, presumed overdose-related arrests were defined as those aged ≤ 50 without an obvious traumatic, respiratory, or cardiovascular (e.g. STEMIs) etiology. TTM was carried out with a combination of the Arctic Sun device, refrigerated crystalloid/antipyretics (goal temperature 32-36°C), maintained for 24hr. Variables included demographics, location (ED vs. OHCA), initial rhythm, ACLS medications (including 20% fat emulsion), and initial return of spontaneous circulation (ROSC). The outcomes were in-hospital survival (primary), ED survival (secondary), and effects of ACLS medications (exploratory). Descriptive statistics, odds ratios (OR), 95% confidence intervals (CI), and chi-squared were calculated with SPSSv20.

Results: Of 923 cardiac arrests in the study period, 195 cases were ≤ 50 yrs, of whom there were 24 respiratory, 32 traumatic, and 5 cardiac etiologies, leaving 134 (14.5%) patients for analysis (median age 41yrs, 73.9% male, OHCA 89%). The most common rhythm was asystole (53.7%), 55 patients (41%) had ROSC, 35 (26.1%) received TTM, and 14 survived to hospital discharge. TTM conferred increased odds of in-hospital survival in the entire cohort (OR 9.5, CI 2.8-32.8, $p < 0.001$), and in OHCA (OR 14.3, CI 2.9-72.0, $p < 0.001$). In the ROSC subset, TTM conferred higher ED (OR 38.5, $p < 0.001$) and in-hospital survival (OR 1.6, $P = NS$). EMS calcium ($p = 0.01$) and atropine ($p = 0.008$) were associated with survival, while EMS dextrose was not (OR 0.2, $p = 0.032$). EMS naloxone had no association with ED (OR 1.6, $P = NS$) or in-hospital survival (OR 0.7, $P = NS$). No patient receiving 20% fat emulsion survived (0/4, $P = NS$).

Discussion: Interventions for OHCA with the best clinical effects were TTM, calcium, and atropine. Naloxone, dextrose, and 20% fat emulsion had no benefit for the resuscitation of overdose-related cardiac arrest.

Conclusion: TTM was associated with improved in-hospital survival for overdose-related cardiac arrest.