STEMI patients after out-of-hospital cardiac arrest: should we cool?

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Introduction: Patients who have been successfully resuscitated after out-of-hospital cardiac arrest (OHCA) due to ST-segment elevation myocardial infarction (STEMI) have a high risk of death and poor neurological outcome. Application of therapeutic hypothermia (TTM) is recommended in addition to the reperfusion strategies in patients who remain comatose after resuscitation. However, data analysis in STEMI patients successfully resuscitated after OHCA who remain comatose are inconsistent and still a subject of discussion.

Objective: The aim of this research was to examine the impact of TTM on in-hospital survival and neurological outcome in comatose STEMI patients after OHCA.

Methods: The study was conducted as a retrospective observational analysis of data taken from a hospital OHCA registry. The examined sample consisted of 141 patients hospitalized from January 2007 to December 2021 due to STEMI complicated by OHCA and who remained comatose upon admission. Inclusion criteria for analysis were STEMI of any localisation and unresponsiveness on admission defined as Glasgow Coma Score (GCS) ≤ 8. Favorable neurological outcome was defined as Cerebral Performance Category Score (CPC) ≤ 2.

Results: Our research included 141 comatose survivors of OHCA due to STEMI, among whom 91 (64.5%) were men, and TTM was applied in 82 (58.2%) patients. Witnessed cardiac arrest (48.7% vs. 23.1%, p = 0.027), duration of resuscitation ≤ 20 minutes (66.1% vs. 28.4%, p < 0.0005), initial shockable rhythm (55.2% vs. 22.9%, p = 0.001) and performed urgent percutaneous coronary intervention (PCI) (56.2% vs. 23.1%, p < 0.0005) had a statistically significant influence on in-hospital survival, while good neurological recovery was influenced only by the duration of resuscitation ≤ 20 minutes (69.2% vs. 36.7%, p = 0.008). TTM was applied more often when the resuscitation lasted ≤ 20 minutes (51.2% vs. 29.3%, p = 0.015), with an initial shockable rhythm (85.4% vs. 14.6%, p < 0.0005) and when urgent PCI was performed (82.9% vs. 35.6%, p < 0.0005). TTM had a statistically significant effect on in-hospital survival (58.5% vs. 23.7%, p < 0.0005), while it had no effect on favorable neurological outcome (54.7% vs. 56.3%, p = 1.000).

Conclusion: In our examined group of STEMI patients successfully resuscitated after OHCA who remained comatose at admission, TTM significantly improved in-hospital survival, but had no effect on favorable neurological outcome.