

Rapid induction of therapeutic Hypothermia after Cardiac Arrest with intranasal cooling– a preliminary report

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Purpose of the study

Induced therapeutic hypothermia improves neurological outcome after cardiac arrest, but there is strong evidence in animal models that delays in introduction of cooling negates its beneficial effects. The performance of a new device in rapid induction of cooling using nasopharyngeal approach was shown in this preliminary investigation of post resuscitation cardiac arrest patients.

Materials and Methods:

Seven patients after successful resuscitation from cardiac arrest were included into the study. Following standard diagnostic and therapeutic procedures, therapeutic hypothermia (TH) was induced by evaporation of aerosolized perfluorochemical (PFC) in the nasopharyngeal cavity using a nasal tubing set (RhinoChill device, BeneChill Inc. San Diego, USA) to achieve cerebral and systemic hypothermia. Temperature measurements were continuously taken throughout induction and maintenance of hypothermia via tympanic (T_{tym}) and arterial catheter (T_{core}). After achieving a target temperature (T_{target}) of 33°C in one of the measurement sites, the cooling method was switched to standard systemic cooling and maintained for 24 hrs. The therapeutic range (THR) was defined as 32-34°C with a Target of 33°C.

Results:

The mean age of the patients was 78 years, the mean time from cardiac arrest to successful ROSC was 22 min. Core temperature on admission was 35.8°C (mean). Application time of the RhinoChill device was 80.3 min (mean), the therapeutic range (34°C) could be reached in 42 min (mean) (tympanic) and in 84 min (mean) (core), representing a cooling rate of 2.52°C/hr (T_{tym}) and 1.6°C (T_{core}). Good recovery was achieved in 2 patients (Cerebral Performance Category 1 or 2), 1 was neurologically impaired, 4 patients died.

Conclusion:

Evaporative nasopharyngeal cooling using a PFC rapidly decreases T_{tym} and T_{core} and provides rapid establishment of therapeutic hypothermia immediately after admission in the ICU. The added benefit of rapid early cooling on outcome remains to be demonstrated.