11-2012

# The Neuroprotective Effects of Therapeutic Hypothermia in Post-Cardiac Arrest Patients: A Systematic Review of the Evidence

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## PATIENT CARE ISSUE

**Background & Significance:**
- Cardiac arrest is a leading cause of death[7]
- About 300,000 cardiac arrests occur each year in the US[13]
- Survival rates vary from 11-48%[6]
- Therapeutic hypothermia (TH) is a relatively new treatment option for cardiac arrest patients[2]

## EVIDENCE-BASED PRACTICE QUESTION

Question: Does therapeutic hypothermia achieve better neurological preservation and decrease mortality in post-cardiac arrest patients compared to normothermia?

Population: Post-cardiac arrest patients who experience return of spontaneous circulation (ROSC)
Intervention: Therapeutic hypothermia
Comparison: Normothermia
Outcome: Achieve better neurological preservation and decrease mortality

## REGISTERED NURSE INTERVIEW

Interviewed Liz Patrick, RN, from Milton S. Hershey Medical Center
- TH is an effective method of neurological preservation
- Cooling is done by IV fluids, blankets, and leg and torso wraps
- Hypothermic temperature maintained for: 24-48hrs
- Goal temperature range: 33-34℃
- Patient is expected to achieve full recovery in 90 days
- Earlier treatment leads to a better outcome

## METHODS

- Databases searched:
  - PubMed
  - Medline
  - CINAHL
  - ScienceDirect
- Selected studies:
  - non-randomized clinical trials
  - randomized clinical trials
  - systematic reviews
  - meta-analyses
- Independent data extraction performed by 2 reviewers
- Reviewers compiled data collectively

## CURRENT PROTOCOLS

- In-hospital
  - for comatose, intubated patients, after ROSC
  - cool within 3 hours, maintain for 24 hours, and rewarm 0.2-0.5℃ per hour
- Out-of-hospital
  - Post-Arrest Therapeutic Hypothermia (PATH)
    - ice packs and chilled normal saline
    - notify receiving hospital

## SYNTHESIS OF EVIDENCE

- All of the studies focused on patients with cardiac arrest caused by cardiac problems, not physical trauma
- Sample sizes: 5-1,038 patients
- Target temperatures: 31-34℃
- Duration of cooling: 3-72 hours
- Cooling methods: IV, surface cooling, or combination
- 4 of the 9 articles said that more research is needed[2,6,7,11]
- The other 5 articles concluded that TH is significantly beneficial[1,3,5,12,13]
- 7 of the articles focused on out-of-hospital cardiac arrest[2,5,6,7,11,12,13]
- 3 of the studies initiated TH in field conditions[1,2,5]

## RESULTS

- TH has been found to have either beneficial or neutral effects on the patient
- There is no clinically significant difference in starting the therapy in the field or the hospital

## EVIDENCE-BASED PRACTICE RECOMMENDATIONS

- TH should be initiated as soon as possible in post-cardiac arrest patients both in-hospital and out-of-hospital.[5]

## LIMITATIONS

- Inconsistency in study variables
- Convenience sampling

## ACKNOWLEDGEMENTS

- Liz Patrick, RN
- D. Scott Baldwin, P

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