TITLE: Normothermia versus Therapeutic Hypothermia for Adult Patients after Cardiac Arrest: Clinical Evidence

DATE: 26 August 2014

RESEARCH QUESTION

What is the clinical evidence for neurological benefits or harms of maintaining normothermia versus induction of therapeutic hypothermia in adult patients following cardiac arrest?

KEY FINDINGS

Six systematic reviews and one randomized controlled trial were identified regarding the comparative neurological benefits and harms of maintaining normothermia versus induction of therapeutic hypothermia in adult patients following cardiac arrest.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2014, Issue 8), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and August 14, 2014. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.
## SELECTION CRITERIA

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<th>Table 1: Selection Criteria</th>
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<td><strong>Population</strong></td>
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<td><strong>Intervention</strong></td>
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<td><strong>Comparator</strong></td>
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<td><strong>Outcomes</strong></td>
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<td><strong>Study Designs</strong></td>
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## RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials (RCTs). Six systematic reviews and one RCT were identified regarding the comparative neurological benefits and harms of maintaining normothermia versus induction of therapeutic hypothermia in adult patients following cardiac arrest. No health technology assessments were identified.

Additional references of potential interest are provided in the appendix.

## OVERALL SUMMARY OF FINDINGS

The summary of study findings is presented in Table 2. Results from the systematic reviews were mixed and some indicated that the quality of evidence was low. The randomized controlled trial, which had a follow-up of 180 days, found that therapeutic hypothermia did not confer a benefit for neurological function compared with maintaining normothermia, in adults with out-of-hospital cardiac arrest.

<table>
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<th>Table 2: Summary of Findings</th>
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<td><strong>Comparators</strong></td>
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<td><strong>Systematic Reviews/Meta-analyses</strong></td>
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| Hunter et al., 2014\(^1\) | Pre-hospital initiation of TH versus No TH | Six RCTs included; N = 715 | No difference in good neurologic outcomes between the 2 groups  
No important benefit to pre-hospital initiation of hypothermia |
| Diao et al., 2013\(^2\) | Pre-hospital initiation of TH versus In-hospital initiation of TH or no initiation of TH | Five RCTs included; N = 633 | No significant differences in neurological outcomes at hospital discharge between any of the interventions  
Quality of evidence was very low |
| Wang et al., 2013\(^3\) | Standard care with normothermia versus Induction of TH | Four RCTs included; N = 417 | Statistically significant improved neurological outcomes for patients receiving TH  
No significant difference in adverse events between the two groups |
<table>
<thead>
<tr>
<th>Authors, publication date</th>
<th>Comparators</th>
<th>Study Sizes</th>
<th>Authors’ Conclusions</th>
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<tr>
<td>Arrich et al., 2012⁴</td>
<td>Induction of TH versus No induction of TH</td>
<td>Four RCTs included; N = 481</td>
<td>• TH seemed to improve neurological outcome, but statistical significance was not indicated in the abstract</td>
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</table>
| Kim et al., 2012⁵         | Induction of TH versus Normothermia | Two RCTs and 12 non-randomized studies included; N not reported | • TH was associated with reduced risk for poor neurological outcome;  
• Most studies had substantial risks of bias and quality of evidence was very low |
| Nielsen et al., 2011⁶     | Induction of TH versus Comparator not specified, but abstract seems to indicate that it is no induction of TH | Five RCTs; N = 478 | • Evidence was inconclusive  
• Quality of evidence was low |
| **Randomized Controlled Trial** |                              |                              |                                                                                       |
| Nielsen et al., 2013⁷     | Induction of TH versus Normothermia | N = 950                      | TH did not confer a benefit for neurological function compared with normothermia, after 180 days follow-up |
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials


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APPENDIX – FURTHER INFORMATION:

Systematic Reviews – Predictive value of tests for neurological outcomes


Non-Randomized Studies


Review Articles
