Perioperative normothermia reduced morbid cardiac events and ventricular tachycardia after noncardiac surgery


Objective
To determine the relation between body temperature during the perioperative period and cardiac outcomes.

Design
Randomised controlled trial with 24-hour follow-up.

Setting
An academic medical centre in the United States.

Patients
300 patients who were > 60 years of age and who were scheduled for peripheral vascular, abdominal, or thoracic surgery and admission to the intensive care unit. Patients either had documented coronary artery disease or were at high risk for it. Exclusion criteria were abnormal electrocardiographic results (ECG), preoperative tympanic temperature < 36 °C or > 38 °C, Raynaud disease, or thyroid disorders.

Intervention
158 patients were allocated to hypothermic care (HC) and 142 to normothermic care (NC). In HC, patients were covered with 1 layer of paper surgical drapes during surgery and with 1 or 2 warmed blankets after surgery. In NC, patients received active warming during surgery and a full-body forced-air cover was used for the first 2 postoperative hours. Temperature and airflow were used to maintain a core temperature of 37 °C. Fluids and blood were warmed and a heat-moisture exchanger was used in all patients.

Main outcome measures
Morbid cardiac events (cardiac arrest, myocardial infarction, or unstable angina or ischaemia) and ECG events (myocardial ischaemia or ventricular tachycardia).

Normothermic care (NC) vs hypothermic care (HC)*

<table>
<thead>
<tr>
<th>Outcomes at 24 h after surgery</th>
<th>NC</th>
<th>EER</th>
<th>HC</th>
<th>CER</th>
<th>(95% CI)</th>
<th>(95% CI)</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbid cardiac events</td>
<td>1%</td>
<td>6%</td>
<td>78%</td>
<td>5%</td>
<td>(12 to 94)</td>
<td>(10 to 172)</td>
<td>(10 to 172)</td>
</tr>
<tr>
<td>ECG events</td>
<td>7%</td>
<td>16%</td>
<td>56%</td>
<td>9%</td>
<td>(10 to 79)</td>
<td>(6 to 74)</td>
<td>(6 to 74)</td>
</tr>
<tr>
<td>Ventricular tachycardia</td>
<td>2.4%</td>
<td>7.7%</td>
<td>69%</td>
<td>5.3%</td>
<td>(0.6 to 91)</td>
<td>(9 to 2734)</td>
<td>(9 to 2734)</td>
</tr>
<tr>
<td>ECG or morbid cardiac events</td>
<td>8%</td>
<td>21%</td>
<td>63%</td>
<td>13%</td>
<td>(31 to 80)</td>
<td>(5 to 19)</td>
<td>(5 to 19)</td>
</tr>
<tr>
<td>Shivering</td>
<td>6%</td>
<td>24%</td>
<td>74%</td>
<td>18%</td>
<td>(49 to 87)</td>
<td>(4 to 10)</td>
<td>(4 to 10)</td>
</tr>
</tbody>
</table>

*ECG = electrocardiographic. Other abbreviations defined in Glossary; RRR, ARR, NNT, and CI calculated from data in article.

Main results
NC compared with HC reduced morbid cardiac events and ECG events (P = 0.02 for both), ventricular tachycardia (P = 0.04), ECG or morbid cardiac events (P = 0.001), and shivering (P < 0.001) (Table).

Conclusion
Perioperative normothermia reduced morbid cardiac events and ventricular tachycardia after noncardiac surgery.

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