M Schwarzl, S Seiler, M Wallner, D von Lewinski, S Huber, H Maechler, P Steendijk, S Zelzer, M Truschnig-Wilders, B Obermayer-Pietsch, A Lueger, BM Pieske, H Post

„Mild hypothermia attenuates circulatory and pulmonary dysfunction during experimental endotoxemia.“

Online supplement
Experimental protocol

* when mean aortic pressure fell below 55 mmHg, a maximum of four 500 ml-boluses of cristalloid volume was given. The 3rd and 4th bolus was enriched with 1 μg/kg epinephrine.
Respirator adjustments

volume controlled mode:
- tidal volume: 10 ml/kg
- PEEP: 5 mmHg
- FiO2: 0.5
- I:E: 1:2
- resp. rate adjusted*

Yes:
- arterial oxygen saturation < 90%?
   (pulse oximetry)

No:
- peak ventilation pressure > 35 mmHg?

Yes:
- perform: endotracheal suction
  adjust: tidal volume: 8 ml/kg
  resp. rate increased*

No:
- adjust:
  • FiO2: 1.0
  • I:E: 1:1

* Respiratory rate was adjusted to maintain an end-tidal CO2-level between 40 and 45 mmHg. When a higher respiratory rate was not followed by an increase of respiratory minute volume, no further adjustments were made.
According to the protocol, respiratory rate was increased in normothermia (NT, closed circles, 38 °C, n=7), but decreased in mild hypothermia (MH, open circles, 33 °C after baseline, n=6). Tidal volume was decreased only in the NT group, such that the respiratory minute volume was lower in MH compared to NT. The fraction of inspired oxygen (FiO2) was increased to 100% in 6/7 animals in NT and 1/6 animals in MH after LPS 2h.
Peak and mean ventilation pressure increased in normothermia (NT, closed circles, 38 °C, n=7) more than in mild hypothermia (MH, open circles, 33 °C after baseline, n=6), and lung compliance decreased less in MH. End-tidal CO2-levels were slightly increased in NT, but not in MH.
Analysis of isolated muscle strips

In LV muscle strips isolated at LPS 8h, the time from peak force to 50% force decline (relaxation time 50%) was shortened during increasing stimulation frequencies and isoproterenol concentrations with no difference between groups.
## Time-domain parameters of heart rate variability

<table>
<thead>
<tr>
<th></th>
<th>baseline</th>
<th>LPS 2h</th>
<th>LPS 5h</th>
<th>LPS 8h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SDNN (ms)</strong></td>
<td>NT</td>
<td>7.6±1.1</td>
<td>7.3±1.5</td>
<td>6.9±1.3</td>
</tr>
<tr>
<td></td>
<td>MH</td>
<td>11.1±2.3</td>
<td>19.3±5.6</td>
<td>11.8±3.6</td>
</tr>
<tr>
<td><strong>RMSSD (ms)</strong></td>
<td>NT</td>
<td>3.3±0.5</td>
<td>1.9±0.4</td>
<td>1.6±0.3</td>
</tr>
<tr>
<td></td>
<td>MH</td>
<td>4.9±2.4</td>
<td>3.3±1.0</td>
<td>5.6±3.8</td>
</tr>
<tr>
<td><strong>NN5 (%)</strong></td>
<td>NT</td>
<td>12±3</td>
<td>4±3</td>
<td>3±3</td>
</tr>
<tr>
<td></td>
<td>MH</td>
<td>13±8</td>
<td>8±5</td>
<td>7±5</td>
</tr>
<tr>
<td><strong>Triangular index (-)</strong></td>
<td>NT</td>
<td>3.8±0.4</td>
<td>3.7±0.5</td>
<td>3.0±0.2</td>
</tr>
<tr>
<td></td>
<td>MH</td>
<td>4.6±1.3</td>
<td>4.3±0.9</td>
<td>2.9±0.4</td>
</tr>
</tbody>
</table>

SDNN: standard deviation of normal-to-normal (NN) intervals, i.e., all intervals between adjacent QRS complexes resulting from sinus node depolarizations (Eur Heart J 1996;17:354-81); RMSSD: square root of the mean squared differences of successive NN intervals; NN5: number of interval differences of successive NN intervals greater than 5 ms; triangular index: number of all NN intervals divided by the number of NN intervals in the modal bin of a discrete density distribution. †: p<0.05 vs NT.