Femoro-iliacal artery versus pulmonary artery core temperature measurement during therapeutic hypothermia: an observational study

Danica Krizanac, Peter Stratil, David Hörburger, Christoph Testori, Christian Wallmueller, Andreas Schober, Moritz Haugk, Maria Haller, Wilhelm Behringer, Harald Herkner, Fritz Sterz & Michael Holzer

AIM OF THE STUDY
Therapeutic hypothermia after cardiac arrest improves neurologic outcome. The temperature measured in the pulmonary artery is considered to best reflect core temperature, yet is limited by invasiveness. Recently a femoro-arterial thermodilution catheter (PiCCO-Pulse Contour Cardiac Output) has been introduced in clinical practice as a safe and accurate haemodynamic monitoring system, which is also able to measure blood temperature. The aim of the study was to investigate, if the temperature measured with the PiCCO catheter reflects pulmonary artery temperature better than other sites during therapeutic hypothermia.

METHODS
In this observational study twenty patients after cardiac arrest and successful resuscitation were cooled with various cooling methods to 33 ± 1°C for 24h, followed by rewarming. Temperatures were recorded continuously in the pulmonary artery (Tpa), femoro-iliacal artery (Tpicco), ear canal (Tear), oesophagus (Toeso) and urinary bladder (Tbla). We assessed agreement of methods using the Bland Altman approach including bias and limits of agreement (LA).

RESULTS
All other sites differed significantly from Tpa with the bias varying from 0.4°C (Tbla) to -0.6°C (Tear). Standard deviations varied from 0.1°C (Tpicco, Toeso) to 0.5°C (Tear). For all sites bias was closer to zero with increasing average temperatures. Bias tended to be larger in the cooling phase compared to overall measurements.

CONCLUSIONS
Temperature measurement in the femoro-iliacal artery (Tpicco) reflects the gold standard of pulmonary artery temperature most accurately, especially during the cooling phase. Tpicco is easily accessible and might be used for monitoring core temperature without the need for additional temperature measurements.
probes.

type: journal paper/review (English)
date of publishing: 29-11-2012
journal title: Resuscitation (84/6)
ISSN electronic: 1873-1570
pages: 805-9