

Category : **Cardiovascular: Monitoring**

A18 - Comparison of cardiac index trending (Δci): estimates by body surface temperatures (BST) combined with biometric data and basic monitoring parameters (CI_CNI) vs. uncalibrated pulse contour analysis (FloTrac and ClearSight) vs trans-cardiopulmonary thermodilution (CI_TD) derived cardiac index

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Introduction:

BST provide a rough estimate of CI. With non-contact infrared thermometers („Thermofocus“, Tecnimed) BST can be measured more accurately than just by clinical examination. We hypothesized BSTs combined with biometric data and basic monitoring parameters might be able to track changes in cardiac index as well as the ClearSight- or FloTrac-system (both Edwards Lifesciences) using the trans-cardiopulmonary thermodilution derived changes of CI_TD (ΔCI_{TD}) of PiCCO (Pulsion) as gold-standard.

Methods:

From 7/2017 till 1/2018 in 31 patients (APACHE II 29 ± 5) 248 data sets were recorded (8 per patient within 24h). Immediately before transcadiopulmonary thermodilution CI_CS and CI_FT were recorded, BST were measured on forehead, forearm (middle and distal), index and great toe, and basic monitoring parameters were recorded and resulted in CI_CNI using multiple regression analysis.

After calculating the percentage of changes in CI, trending was assessed with concordance analysis with four quadrant plot, polar plot analysis and polar concordance rate. We established exclusion zones for all $\Delta CI < 0,1\%$. Statistics: IBM SPSS 25, Microsoft Excel

Accuracy and precision for CI_CNI for a smaller data set have been presented at ISICEM 2018.

Results:

Concordance in four quadrant plot was $< 95\%$ for all devices and CI_CNI, Polar concordance was $< 92\%$ for all devices and CI_CNI, Angular Bias was acceptable for CI_CNI and CI_FT, Radial LoA were acceptable for CI_FT and almost for CI_CNI as in the table.

Conclusion:

Concordance rates and polar concordance rates for all devices were far too low for all devices and CI_CNI. CI_CNI and CI_FT showed acceptable angular bias ($< 5^\circ$). CI_FT showed acceptable Radial Limits of agreement within the $\pm 30^\circ$ borders, CI_CNI was close. CI_CS had neither an acceptable angular bias nor acceptable limits of agreement. In contrast to CI_CS, CI_CNI provides comparable estimates of changes in cardiac index to CI_FT.

Table:

.	CI_CNI	CI_CS	CI_FT
Concordance (4QP)	40%	39,4%	39,1%
Angular bias	3,2°	19,8°	4,5°
Radial LoA	31,9°	-9,53°to 49,15°	+/- 28°
Polar Concordance (PP)	36,2%	30,3%	36,5%

results