

Category : **Cardiovascular: Monitoring**

A19 - Improvement of accuracy and precision of cardiac power index (CPI) calculated from flotrac- and clearsight data by using a non-invasive estimate of ci compared to cpi derived from transpulmonary thermodilution (TPTD)

J Mangold¹; U Mayr²; W Huber²; T Lahmer²

¹Klinikum Rechts der Isar, II. Med. Klinik, Munich, Germany, ²Klinikum Rechts der Isar, Munich, Germany

Introduction:

Non- or semi-invasive systems for hemodynamic monitoring (e.g. Flotrac- & Clearsight-system, both Edwards Lifesciences) do not provide CPIs.

Methods:

From 7/2017 till 1/2018 in 31 patients (APACHE II 29±5) 248 data sets were recorded (8 per patient within 24h). We calculated CPI_FT and CPI_CS from Flotrac- and Clearsight data and CPI_TD as gold-standard from CI derived by TPTD ($CPI = MAP * CI * k$).

For MAP_CS Bland-Altman analysis showed acceptable bias (3.8 mmHg) and quite good SD (12.13 mmHg), PE (28.4%) and LoA (-20.1 mmHg to 27.6 mmHg) for MAP_CS leading to minimal deviation in error grid analysis (zone „A“: 79.0%, „B“: 18.5%, „C“: 2.4%, no pairs in zone „D“ and „E“).

But due to poor results of CI-data of FT & CS (CI_FT: bias 0,03 L/min/m², PE 63,3%, LoA -2,64 to 2,71 L/min/m²; CI_CS: bias 0,81 L/min/m², PE 51,4%, LoA -1,36 to 2,98 L/min/m²) we hypothesized, that we could improve CPI_FT and CPI_CS by combining their corresponding CIs with a regression derived estimate of CI (CI_CNI, bias 0,035 L/min/m², PE 46,1%, LoA -1,91 to 1,98 L/min/m²) based on BST, biometrics and basic monitoring data (CI_FT_CNI & CI_CS_CNI).

Using CI_FT_CNI and CI_CS_CNI we then calculated CPI_FT_CNI and CPI_CS_CNI.

Derivation and validation of CI_CNI on a smaller data set have been presented at ISICEM 2018, for CI_FT_CNI and CI_CS_CNI at ESICEM 2018.

Results:

CPI_FT had a bias of 0.01 W/m² with LoA from -0.48 to 0.51 W/m² and PE of 63.6%. CPI_CS had a bias of 0.17 W/m² with LoA from -0.23 to 0.57 W/m² and PE of 51.5%. CPI_FT_CNI had a bias of 0.00 W/m² with LoA from -0.33 to 0.34 W/m² and PE of 43.2%. CPI_CS_CNI had a bias of 0.03 W/m² with LoA from -0.33 to 0.40 W/m² and PE of 47.2%.

Conclusion:

CPI_FT had smaller and acceptable bias than CPI_CS, but bigger PE and wider LoA (as their corresponding CIs). Using combined information for CI from CI_CNI and FT or CS data improved accuracy of CPI_CS and little for CPI_FT, but precision was still poor for both.