Comparison between pulse waveform analysis and thermodilution cardiac output determination in patients with severe pre-eclampsia

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Background: This study compared cardiac output (CO) measurements derived from pulse waveform analysis with values obtained by thermodilution (TD), in patients with post-partum complications of severe pre-eclampsia.

Methods: Eighteen patients were recruited, 24-96 h post-delivery. After central venous calibration of the pulse waveform analysis monitor (LiDCOplus), CO readings were compared with those obtained by the TD method and repeated twice at 15 min intervals. The comparison was repeated after peripheral venous calibration. Further comparisons were made in eight patients at 120 and 240 min after peripheral venous calibration.

Results: Data were pooled for measurements at 0, 15, and 30 min after calibration. For the comparison between TD and LiDCOplus using central venous calibration, TD exhibited a significant positive bias of 0.58 litre min^{-1} [95% confidence interval (CI): 0.77 to 0.39]. After peripheral venous calibration, there was no significant bias [0.16 litre min^{-1} (95% CI: -0.37 to 0.06)]. The estimated limits of agreement for central and peripheral venous calibrations were -2.12 to 0.96 and -1.50 to 1.20 litre min^{-1}, respectively. When comparing LiDCOplus and TD, there was no time-based effect at 120 or 240 min post-peripheral calibration.

Conclusions: Central and peripheral venous calibrations of the LiDCOplus monitor were associated with clinically insignificant bias when compared with TD. Limits of agreement were within the recommendation of 30% for acceptance of a new CO technique when compared with current reference methods. This form of minimally invasive CO monitoring may have a valuable role in obstetric critical care.