

Non-Invasive Haemoglobin Measurement in Patients Undergoing Elective Caesarean Section.

Butwick A., Hilton G., Carvalho B. *Br J Anaesth.* 2012 Feb;108(2):271-7.

Background

The ability to measure haemoglobin (Hb) real-time and non-invasively offers important clinical value in the assessment of acute changes in maternal Hb during the peripartum period. This study evaluates the Masimo Rainbow SET Radical-7 Pulse CO-Oximeter in a pregnant population undergoing Caesarean section (CS).

Methods

Fifty patients undergoing elective CS were enrolled in this prospective, controlled study and followed for 48 h after surgery. Non-invasive Masimo Hb (SpHb) values were compared with laboratory Hb values from venous blood samples drawn at baseline, immediately post-CS, and 24 h post-CS using the Bland-Altman plots. Longitudinal analysis of SpHb changes over time was performed using mixed-effects regression modeling.

Results

For the comparison between SpHb and laboratory Hb, SpHb displayed a significant positive bias at baseline {1.22 g dl(-1) [95% confidence interval (CI): 0.89-1.54]} and at 24 h post-CS [1.36 g dl(-1) (95% CI: 1.04-1.68)]. The bias immediately post-CS was 0.14 g dl(-1) (95% CI: -0.18 to 0.46). The limits of agreement at baseline, immediately post-CS, and at 24 h post-CS were: -0.9 and 3.33, -2.35 and 2.56, and -0.55 and 3.27 g dl(-1), respectively. The mean decrease in SpHb from baseline to 48 h post-CS was ~1 g dl(-1).

Conclusions

The variability in bias and limits of agreements of the Rainbow SET Radical-7 Pulse CO-Oximeter SpHb may limit its clinical utility for assessing Hb concentration in patients undergoing elective CS. Modifications are needed in the calibration of the device to improve accuracy and precision in an obstetric setting. The study was registered at clinicaltrials.gov (NCT01108471) before participant enrolment.