

The Efficacy of Noninvasive Hemoglobin Measurement by Pulse CO-Oximetry in Neonates

Jung Y.H., Lee J., Kim H.S., Shin S.H., Sohn J.A., Kim E.K., Choi J.H. *Pediatr Crit Care Med.* 2013 Jan;14(1):70-3.

Objective: To evaluate clinical applicability of noninvasive hemoglobin (Hb) measurement with a pulse COoximeter in neonates.

Design: Prospective comparison study.

Setting: Neonatal ICU.

Patients: Fifty-six preterm and term infants with median age = 20 days (range = 1-98 days) and median weight = 1,440 g (range = 530-4,230 g).

Interventions: Hb measurements by Pulse CO-Oximetry (Masimo Radical-7) were recorded immediately prior to venous samplings.

Measurements and Main Results: The collected data were compared with the corresponding venous Hb level obtained in laboratory testing, and a total of 137 data pairs were analyzed. Noninvasive Hb values measured with a pulse CO-oximeter were significantly correlated with the venous Hb levels (correlation coefficient, $r = .758$; $p < .001$). Hb values measured with a pulse CO-oximeter were higher than those measured with a laboratory hematology analyzer (13.3 ± 2.6 g/dL vs. 12.5 ± 3.1 g/dL). In terms of the agreement between the laboratory analyzer and the pulse CO-oximeter, 94.8% of the measurements fell within two standard deviations of the mean difference.

Conclusion:

Noninvasive Hb measurements with Pulse CO-Oximetry provide clinically acceptable accuracy, and they were significantly correlated with laboratory Hb measurement in neonates. In terms of the clinical applicability, noninvasive Hb monitoring with a pulse CO-oximeter could be useful in the early detection of Hb changes in neonates.