

Comparison of Hemoglobin Values Measured by Blood and Continuous Non-Invasive Monitoring (SpHb) in Newborn Infants

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Objective

Hemoglobin (Hb) measurement is one of the most commonly used laboratory tests in medical practice. Unnecessary blood sampling, especially in neonatal intensive care units (NICUs), contributes to iatrogenic anemia. Continuous non-invasive monitoring of total Hb (SpHb) was compared with invasive venous blood samples (tHb) in NICU patients.

Methods

Three hundred and ten patients were identified in NICU. Non-invasive Hb measurement was performed immediately before venous blood sampling and comparison of invasive with non-invasive values was undertaken.

Results

There was a strongly positive correlation between SpHb and tHb ($r = 0.965$, $p < 0.001$). Bland–Altman analysis was performed in 95% limits of agreement for Hb values measured by both methods. The mean bias between tHb and SpHb measurements was 0.05 g/dl (–1.85 to 1.96). In Passing–Bablok regression analysis, the CUSUM test p value was found to be 0.98 for Hb levels measured by SpHb and tHb; and the difference between the methods was not significant.

Conclusion

In newborns, SpHb method offers reliable Hb values, which are comparable with the more traditional tHb method. Continuous non-invasive monitoring of total Hb may help prevent unnecessary blood sampling and iatrogenic anemia. Further clinical studies are required for the effectiveness of the method in critically ill patients with circulatory disorders.