

Evaluation of a Noninvasive Hemoglobin Measurement Device to Screen for Anemia in Infancy

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Objective: Iron deficiency is the most prevalent micronutrient deficiency worldwide and a common medical condition in the United States. The American Academy of Pediatrics has recommended universal screening for iron deficiency anemia in infants at approximately 1 year of age. This screening involves invasive venous blood sampling which increases the clinic visit time and may cause significant stress to the patient and family members. The purpose of this study was to assess the accuracy and utility of a non-invasive hemoglobin measurement device compared to standard laboratory hemoglobin measurement from venipuncture.

Methods: One hundred ten children were enrolled in the study following a well-child examination at San Antonio Military Medical Center from June 2012 to June 2014. Each child had a hemoglobin measurement obtained with the Masimo Pronto with Rainbow^(®) R20L disposable sensor followed by venipuncture that was sent to the clinical laboratory for hemoglobin measurement. Paired hemoglobin results from the non-invasive device and the clinical laboratory were compared.

Results: Ninety-seven children successfully had hemoglobin measured by the Masimo Pronto device. Hemoglobin values obtained with the Masimo Pronto were significantly correlated with venous hemoglobin levels, with a correlation coefficient of 0.48. A hemoglobin level less than 11.5 gm/dL on the Masimo Pronto had a sensitivity of 82 % and a negative predictive value of 95 % when compared to venous hemoglobin level less than 11 gm/dL.

Conclusions for Practice:

Non-invasive hemoglobin testing with the Masimo Pronto device may be a useful screening tool for anemia in infants that avoids invasive testing.