

Screening Healthy Infants for Iron Deficiency Using Reticulocyte

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Context: Current clinical practice relies on hemoglobin to detect iron deficiency, which misses infants not yet anemic and places them at higher risk for neurocognitive impairment. Reticulocyte hemoglobin content (CHr) has never been compared with hemoglobin for screening healthy infants.

Objectives: To evaluate CHr for detecting iron deficiency without anemia in healthy 9- to 12-month-old infants and to compare CHr with hemoglobin in screening for iron deficiency in this population. A secondary objective was to explore the association between CHr and subsequent development of anemia.

Design, Setting, and Patients: A prospective observational cohort study of 202 healthy 9- to 12-month-old infants from an urban, hospital-based, primary care clinic in Boston, Mass, who were screened for iron deficiency between June 2000 and April 2003, and followed up for a median of 5.6 months.

Main Outcome Measures: Iron deficiency (transferrin saturation <10%) and anemia (hemoglobin <11 g/dL).

Results: Of 202 infants enrolled, 23 (11.4%) had iron deficiency and 6 (3%) had iron deficiency and anemia. Iron-deficient and non-iron-deficient infants had significantly different values for all measured hematological and biochemical markers for iron deficiency. Optimal CHr cutoff for detecting iron deficiency was 27.5 pg (sensitivity, 83% and specificity, 72%); a hemoglobin level of less than 11 g/dL resulted in a sensitivity of 26% and a specificity of 95%. Reticulocyte hemoglobin content was more accurate overall than hemoglobin was for detecting iron deficiency (area under the receiver operating characteristic curve, 0.85 vs 0.73; $P = .007$). A CHr of less than 27.5 pg without anemia at initial screening was associated with subsequent anemia when screened again in the second year of life (risk ratio, 9.1; 95% confidence interval, 1.04-78.9; $P = .01$).

Conclusions: A CHr of less than 27.5 pg is a more accurate hematological indicator of iron deficiency compared with hemoglobin of less than 11 g/dL in these healthy 9- to 12-month-old infants. Further studies are warranted to determine whether CHr should be the preferred screening tool in the early detection of iron deficiency in infants.

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