

Poor Validity of Noninvasive Hemoglobin Measurements by Pulse Oximetry Compared with Conventional Absorptiometry in Children in Côte d'Ivoire.

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Anemia remains a major public health issue in many African communities. We compared a novel, commercially available noninvasive hemoglobin (Hb)-measuring device to direct Hb measurements by finger-prick samples in a pediatric cohort in rural Côte d'Ivoire. Noninvasive Hb measurements were attempted in 191 children 2-15 years of age and obtained in 102 (53.5%) children. The median Hb for the 102 children was 12.0 g/dL (interquartile range [IQR] = 11.3-12.7 g/dL) for conventional absorptiometry and 13.3 g/dL (IQR = 12.1-14.2 g/dL) for noninvasive measurements. A Bland-Altman analysis demonstrated a median bias of +1.1 g/dL (IQR = 0.4-2.0 g/dL), with greater overestimation of Hb by noninvasive testing occurring at low Hb values. This overestimation of the noninvasive Hb-measuring device to direct Hb measurements persisted across preschool- and school-aged children, and both sexes. The Pearson correlation coefficient was 0.50 for children 4-9 years of age, and 0.33 for children 10-15 years of age. Further study and development of noninvasive Hb devices is necessary prior to implementation in African pediatric populations.