

Performance of the integrated management of childhood illness algorithm for diagnosis of HIV-1 infection among African infants.

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Abstract

OBJECTIVES: Early infant HIV-1 diagnosis and treatment substantially improve survival. Where virologic HIV-1 testing is unavailable, integrated management of childhood illness (IMCI) clinical algorithms may be used for infant HIV-1 screening. We evaluated the performance of the 2008 WHO IMCI HIV algorithm in a cohort of HIV-exposed Kenyan infants. **METHODS:** From 1999 to 2003, 444 infants had monthly clinical assessments and quarterly virologic HIV-1 testing. Using archived clinical data, IMCI sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated using virologic testing as a gold standard. Linear regression and survival analyses were used to determine the effect of age on IMCI performance and timing of diagnosis. **RESULTS:** Overall IMCI sensitivity, specificity, PPV, and NPV value were 58, 87, 52, and 90%, respectively. Sensitivity (1.4%) and PPV (14%) were lowest at 1 month of age, when 81% of HIV infections already had occurred. Sensitivity increased with age ($P < 0.0001$), but remained low throughout infancy (range 1.4-35%). Specificity (range 97-100%) was high at each time point and was not associated with age. Fifty-eight percent of HIV-1-infected infants (50 of 86) were eventually diagnosed by IMCI, and use of IMCI was estimated to delay diagnosis in HIV-infected infants by a median of 5.9 months ($P < 0.0001$). **CONCLUSION:** IMCI had low sensitivity during the first month of life, when the majority of HIV-1 infections had already occurred and initiation of treatment is most critical. Although sensitivity increased with age, the substantial delay in HIV-1 diagnosis using IMCI limits its utility in early infant HIV-1 diagnosis.