ABSTRACT

Background: Infant HIV-1 infection is associated with impaired neurologic and motor development. Antiretroviral therapy (ART) has the potential to improve developmental outcomes but the relative contributions of pre-ART disease status, growth, treatment regimen and ART response during infancy are unknown.

Methods: Kenyan ART-naive infants <5-months old initiated ART and had monthly assessment of age of full neck control, unsupported walking and monosyllabic speech during 24 months of follow-up. Pre-ART and post-ART correlates of age at milestone attainment were evaluated using t tests or multivariate linear regression.

Results: Among 99 infants, pre-ART correlates of later milestone attainment included: underweight and stunted (neck control, walking and speech, all P values <0.05), missed prevention of mother-to-child transmission ($P = 0.04$) (neck control), previous hospitalization, World Health Organization (WHO) Stage III/IV, low CD4 count, and wasting (speech and walking, all P values <0.05), and low maternal CD4 (speech, $P = 0.04$). Infants initiated ART at a median of 14 days following enrollment. Infants receiving lopinavir/ritonavir-based versus nevirapine-based ART attained later speech (18.1 vs. 15.5 months, $P = 0.003$). Adjusting for pre-ART level, lower 6-month gain in CD4% was associated with later walking (0.18 months earlier per unit increase in CD4%; $P = 0.004$) and speech (0.12 months earlier per unit increase in CD4%; $P = 0.05$), and lower 6-month gains in weight-for-age ($P = 0.009$), height-for-age ($P = 0.03$) and weight-for-height ($P = 0.02$) were associated with later walking.

Conclusion: In HIV-infected infants, compromised pre-ART immune and growth status, poor post-ART immune and growth responses, and use of lopinavir/ritonavir-based versus nevirapine-based ART were each associated with later milestone attainment. The long-term consequences of these delays are unknown.