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Growth and body composition in children beginning or changing antiretroviral therapy

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BACKGROUND: Determinants of growth and body composition in HIV+ children on antiretroviral therapy (ART) are poorly understood. Objectives of this study were to describe changes in growth and body composition in HIV+ children after initiating or changing ART and correlate these changes with viral load (VL) and CD4%; and to describe changes in and correlates of insulin-like growth factor-1 (IGF-1) and binding proteins-1 and -3 (IGFBP-1 and -3).

METHODS: A prospective, observational study of 100 HIV+ children ages 1 mo to <13 yrs over 48 wks upon beginning or changing ART. Criteria included: a) beginning any ART if naïve, b) beginning protease inhibitor (PI) if PI naïve, or c) changing ART with ≥ 2 new drugs. Anthropometry and bioelectrical impedance analysis at wks 0-48 were compared to age/sex/race-matched controls from NHANES to generate z-scores. Plasma VL, CD4%, IGF-1 and IGFBP-1 and -3 were measured. Multivariable stepwise regression identified significant correlates of z-score changes.

RESULTS: All anthropometric and BIA measures of lean and fat mass were significantly below age/sex/race-adjusted norms; weight, height, and total body water (TBW) z-scores increased significantly over the study. In multivariate analysis, both lean and fat mass measures increased more with lower entry CD4% [wt, $p=0.003$; triceps skinfold, $p=0.010$; body mass index (BMI), $p=0.002$; TBW, $p=0.049$]. BMI and % body fat z-scores increased more in PI-naïve children. Body composition changes were not associated with virologic response, increase in CD4%, or current ART class. IGF-1 increased ($p=0.020$) while IGFBP-1 decreased ($p=0.007$).

CONCLUSIONS: HIV+ children beginning or changing ART demonstrate greater gains in weight, height and lean mass than age/sex/race-adjusted norms. Baseline characteristics, but not virologic response to therapy, immune reconstitution nor specific ART class(es) in the new regimen are associated with growth or body composition changes. IGF-1 increases and IGFBP-1 decreases in these children may relate physiologically to growth and body composition changes.

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