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Lower Height-For-Age and Weight-For-Age Z Scores Among HIV Exposed Children Aged 3-10 Years

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Background: Despite effective antiretroviral therapy, children born to women living with HIV but who remain uninfected (CHEU) have poorer growth compared to children born to women living without HIV (CHUU). Few studies have compared growth beyond early childhood.

Methods: In a cross-sectional study, we enrolled CHEU and CHUU aged 3-10 years in Kenya. Growth z-scores were calculated using the WHO growth standards (weight-for-age [WAZ], height-for-age [HAZ], body mass index [BMIZ] [age 5-10] and head circumference-for-age [HCZ] [age 3-5]). Growth faltering was defined as Z-scores of ≤-2 standard deviations. We compared HEU/HUU growth Z-scores and growth faltering prevalence using mixed effects linear regression models and generalized estimating equations adjusting for socio-demographic characteristics, food security and enrollment site.

Results: We enrolled 1781 CHEU and 199 CHUU. The median age was 6.5 years (IQR: 5, 9) for CHEU and 5.9 (IQR: 4, 8) for CHUU. CHEU were more likely to be orphaned and vulnerable children (OVC) and to have breastfed for shorter period. CHEU mothers were older, had fewer years of education, and were more likely to be single parents and have severe household food insecurity.

CHEU had significantly lower HAZ (adjusted mean difference [aMD] -0.39 95%CI -0.64, -0.14, p=0.002) and WAZ (aMD -0.26 95%CI -0.44, -0.08, p=0.004) than CHUU. HCZ was lower among CHEU than CHUU in unadjusted models (MD -0.28, 95%CI -0.52, -0.05, p=0.017). There were no differences in BMIZ.

CHEU had 1.8 times higher prevalence of stunting (HAZ ≤-2) in unadjusted models, but the effect was attenuated after adjustment (adjusted prevalence ratio 1.54, 95%CI 0.90, 2.65, p=0.116). There were no differences in the prevalence of Z-scores ≤-2 for WAZ, BMIZ or HCZ.

Among CHEU, poorer growth was associated with having a single parent, severe food insecurity, OVC and low birth weight (<2500grams).

Conclusion: CHEU had poorer weight and length growth than CHUU. Sociodemographic factors contributed to CHEU growth compromise as demonstrated by attenuation of associations in adjusted models and significant influence of orphanhood, low birth weight, and food insecurity. The persistent association of CHEU with poor growth after adjustment suggests potential role of biologic factors.