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Vitamin D Deficiency in HIV-Infected and -Uninfected Women in the United States

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We read the article by Adeyemi et al with interest¹ because we had recently conducted similar analyses at our site using data from an HIV+ cohort followed at the HIV Outpatient Program based at the Interim Louisiana State Hospital and an HIV– population of women who were evaluated at 2 sexually transmitted disease clinics, one of each located in the states of Louisiana and Mississippi. Data on 90 HIV+ and 286 HIV– women were collected between October 2006 and December 2010. The data from HIV– women were limited to vitamin D levels, race, and age, but several additional variables of interest were available on HIV+ women.

HIV+ women were significantly older than HIV– women (mean age = 49.1 years $\pm$ 11.9, median = 49 years vs. 27.8 years $\pm$ 4.71, median = 27 years; $P < 0.0001$), but the 2 groups were racially similar (94.4% African American in HIV– vs. 93.3% African American in HIV+; $P = 0.8$). In our analysis, 263 of 376 (69.9%) women had vitamin D levels < 20 ng/mL. The proportions of HIV+ (63 of 90, 70.0%) and HIV– women (200 of 286, 69.9%) with vitamin D levels < 20 ng/mL were the same. In combined study population (HIV+ and HIV– women), the proportion of African American women with vitamin D levels < 20 ng/mL was significantly higher than non African American women (71.7% vs. 40.9%, $P = 0.002$). Among women with vitamin D < 20 ng/mL, 81.4% were under 40 years of age, 8.7% were between 40 and 50 years, and 9.9% were older than 50 years of age. African American race [adjusted odds ratio (OR) = 3.81, 95% confidence interval (CI) = 1.57 to 9.22; $P = 0.003$] remained significantly associated with vitamin D levels < 20 ng/mL in a logistic regression analysis controlling for age (adjusted OR = 0.97, 95% CI = 0.94 to 1.01; $P = 0.12$) and HIV status (adjusted OR = 1.78, 95% CI = 0.73 to 4.35; $P = 0.20$).

In logistic regression analyses confined to HIV+ women, body mass index (BMI) < 18.5 kg/m² (adjusted OR = 0.03, 95% CI = 0.001 to 0.67; $P = 0.03$) and previous vitamin D supplementation (adjusted OR = 0.22, 95% CI = 0.06 to 0.81; $P = 0.02$) significantly predicted vitamin D levels > 20 ng/mL, whereas CD4 count < 500 cells per cubic millimeter significantly predicted vitamin D levels < 20 ng/mL (adjusted OR = 3.60, 95% CI = 1.03 to 12.56; $P = 0.04$). Tenofovir use (adjusted OR = 3.69, 95% CI = 0.97 to 14.08; $P = 0.06$) weakly predicted vitamin D levels < 20 ng/mL.

Our results are consistent with those found by Adeyemi et al.¹ The prevalence of vitamin D deficiency (vitamin D levels < 20 ng/mL) among HIV– women were similar (70.0% in our study and 71.8% in the Women's Interagency HIV Study [WIHS]), and among HIV+ women, the prevalence of vitamin D deficiency in our study (70%) and in the WIHS cohort

(60%) were within the 45%–87% range reported in several studies of vitamin D levels among individuals infected with HIV.^{2–4} In the study by Adeyemi et al¹ and in our study, African American race and high BMI were significant predictors of vitamin D deficiency. These findings were not unexpected because African American race^{2–4} and high BMI^{5,6} have been shown to be risk factors for vitamin D deficiency in the general population.^{7,8} Among HIV+ women, lower CD4 count remained an independent significant predictor of vitamin D deficiency in the WIHS and our cohorts. HIV infection in our study was not a significant predictor of vitamin D levels. This was also consistent with the lack of independent significant association of HIV infection with vitamin D levels in the WIHS cohort when vitamin D was modeled as a continuous variable.¹ The findings from the WIHS cohort of significant associations of geographic locations with vitamin D deficiency¹ suggest that additional studies from other geographic areas with diverse populations are warranted to evaluate predictors for low vitamin D levels both in the general population and among HIV+ individuals.

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