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## RISK FACTORS FOR VITAMIN D DEFICIENCY IN AN ETHNICALLY DIVERSE URBAN HIV COHORT: WHICH ANTIRETROVIRALS ARE IMPLICATED?

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**BACKGROUND:** Several studies have shown high rates of Vitamin D insufficiency among HIV patients and suggest that specific antiretrovirals may affect serum 25(OH)D [circulating vitamin D] levels. Optimal vitamin D status is associated with beneficial health outcomes including reduced fracture risk, cardiovascular morbidity and enhanced innate immunity.

**METHODS:** Cross sectional study of 1063 adult HIV outpatients in South London. Risk factors for low 25(OH)D and raised ALP were examined using multivariable linear regression.

**RESULTS:** Median age was 40 years (35, 46), 59.4% men, 35% white, 58% black, CD4 452 cells/mm<sup>3</sup> (324, 613). Median serum 25(OH)D was 13.3 µg/L (8.2, 20.8). 91.2% had 25(OH)D levels <30 µg/L (suboptimal), 72.9% had 25(OH)D <20 µg/L (deficient), 34.2% <10 µg/L (severely deficient) and 6.4% had undetectable 25(OH)D levels. 25(OH)D levels were higher in the summer than winter (14.2 versus 11.2 µg/L;  $P < 0.001$ ), but the proportion attaining optimal 25(OH)D was not significantly different. Factors associated with lower serum 25(OH)D were black race ( $P < 0.001$ ), low CD4 nadir (0.002) and Efavirenz (EFZ) use (0.004). Tenofovir (TDF) use was associated with a higher 25(OH)D level ( $P = 0.001$ ). Factors associated with increased ALP (with normal AST) were increased duration of HIV ( $P = 0.01$ ), TDF use ( $P = 0.03$ ) and EFZ use ( $P = 0.004$ ). Serum calcium and CD4 count were inversely associated with ALP level. Patients with low 25(OH)D on TDF were twice as likely to have an ALP >ULN than those on ABC (OR=2.4 [CI 1.5, 3.9];  $P = 0.001$ ) and 4 times as likely compared to other NRTIs (OR=4.6 [CI 1.6, 13.3]  $P = 0.002$ ).

**CONCLUSIONS:** Hypovitaminosis D is almost universal in this cohort. EFZ use was associated with a lower 25(OH)D and TDF with a higher 25(OH)D level, although both drugs were independently associated with ALP elevations. Further studies are required to define the potential mechanisms and clinical implications of this interaction between ART, Vitamin D and bone.

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