

Effect of low-dose oral vitamin D on bone mineral density changes in HIV patients: Longitudinal prospective study for 6 years

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Introduction

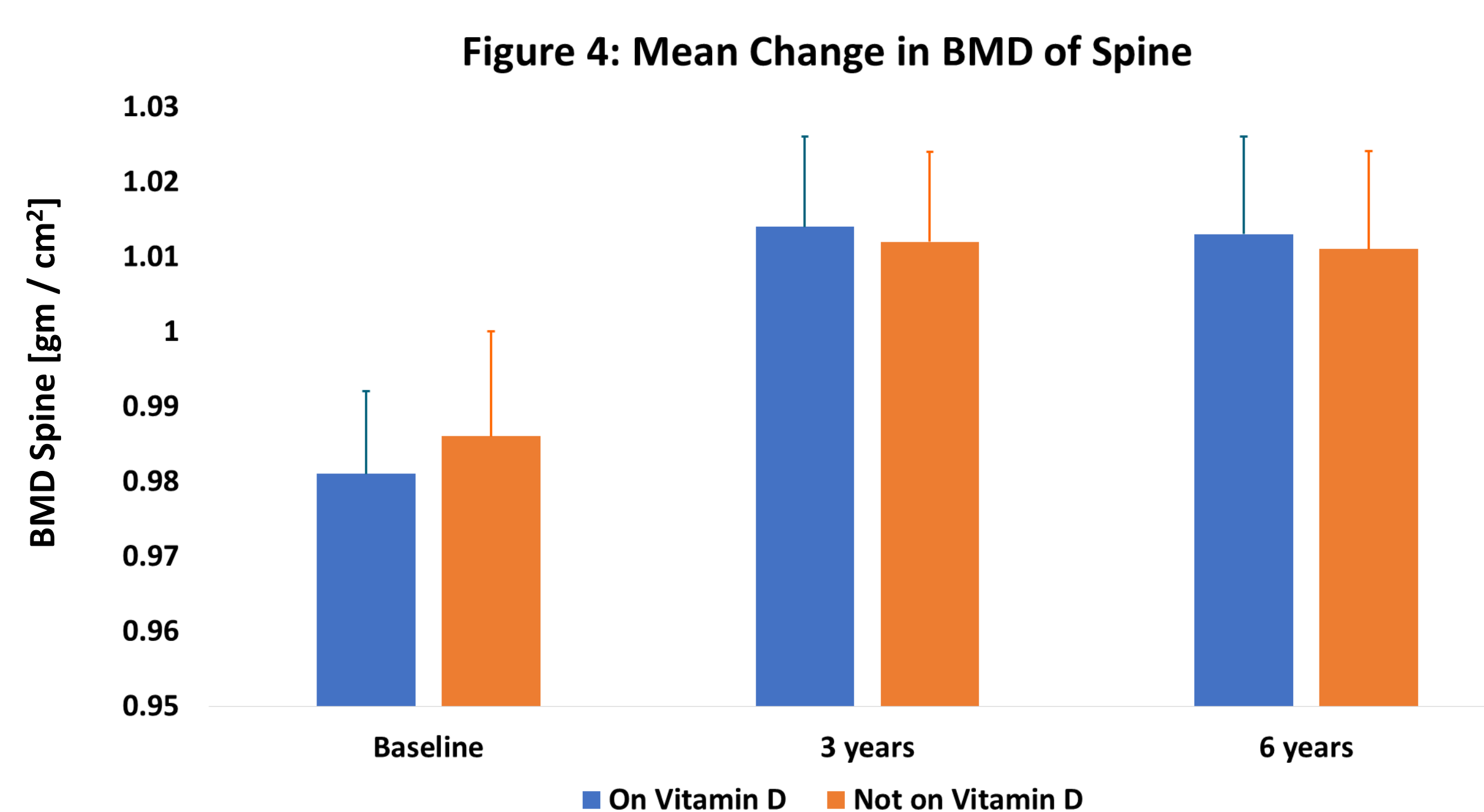
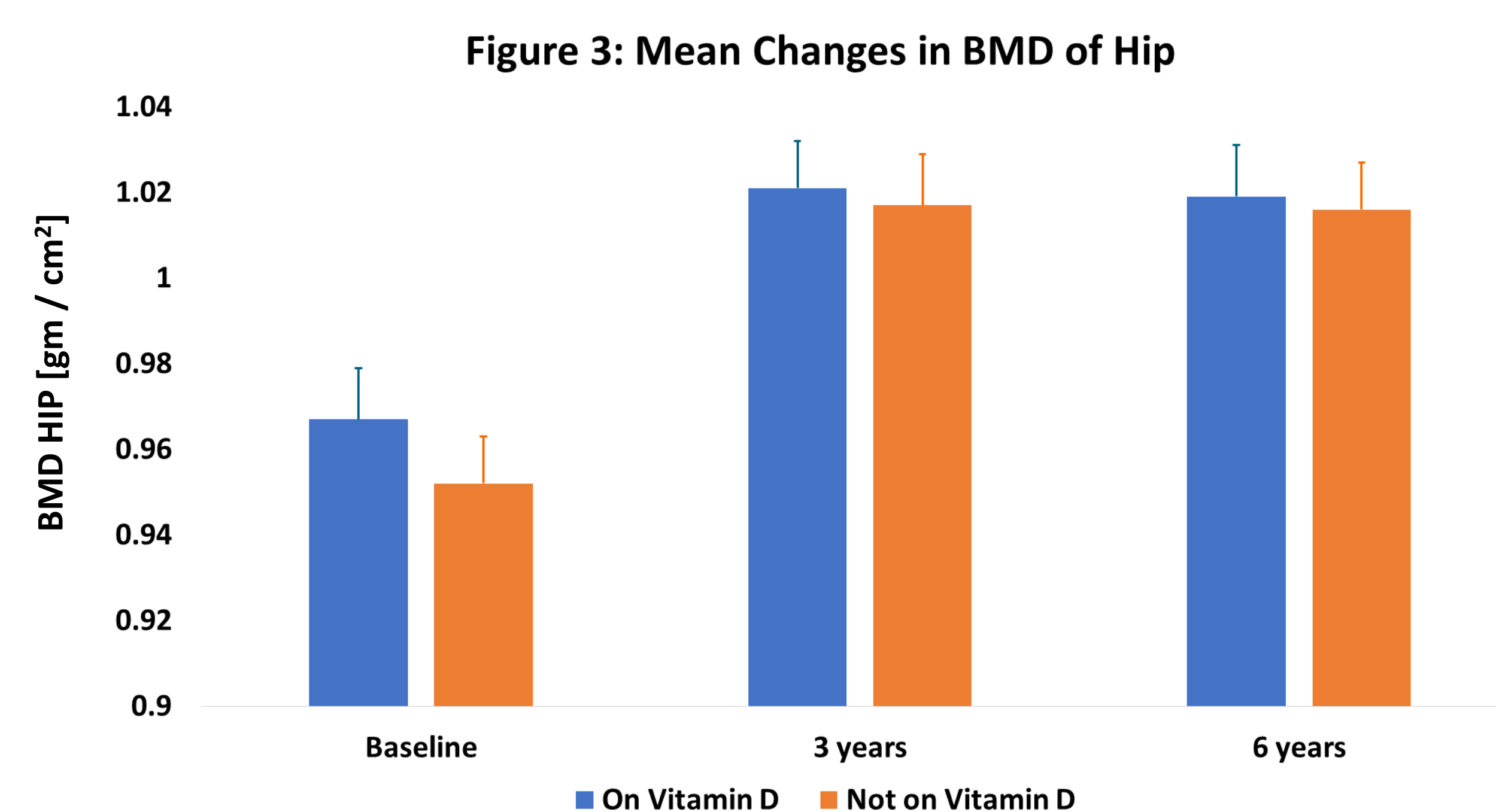
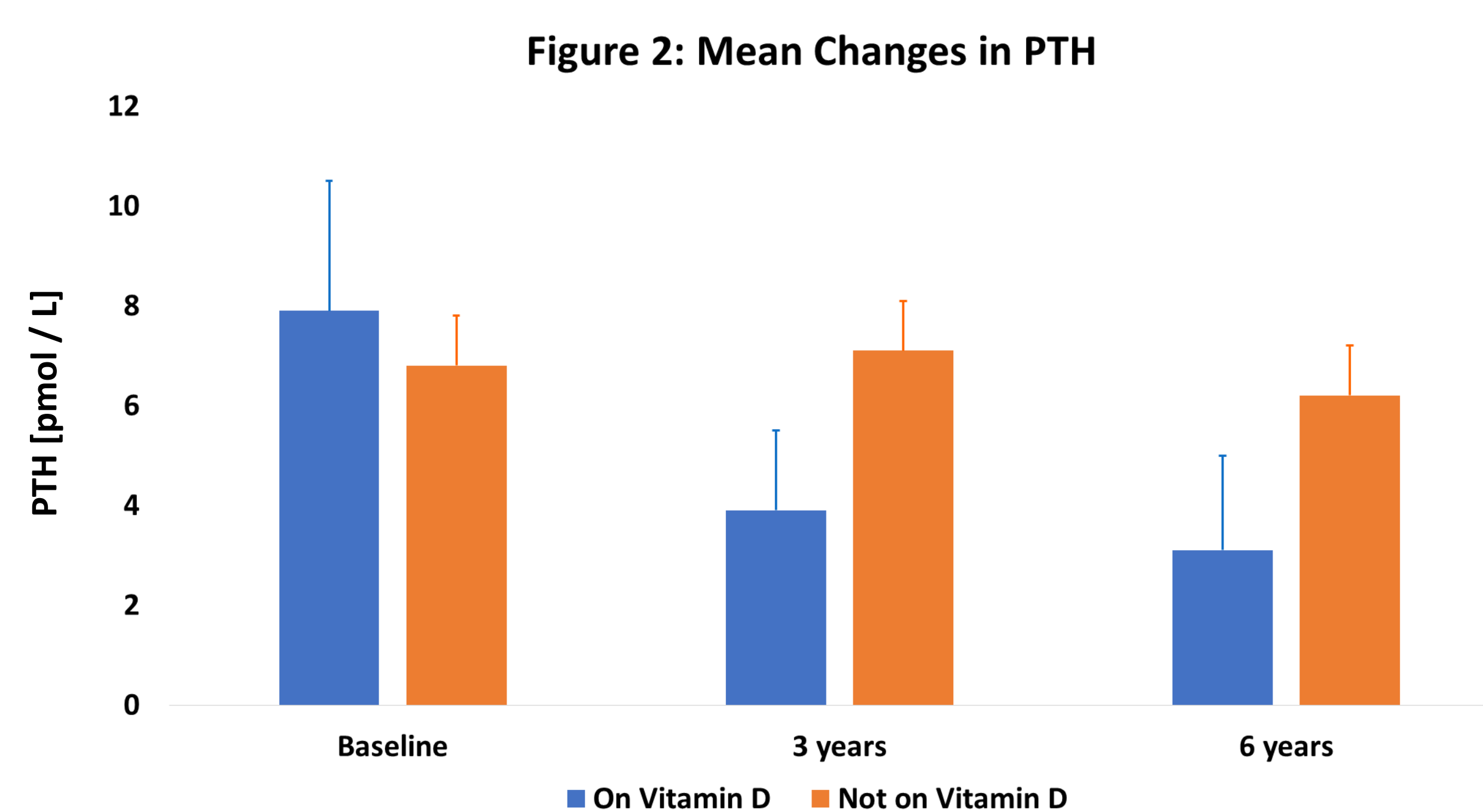
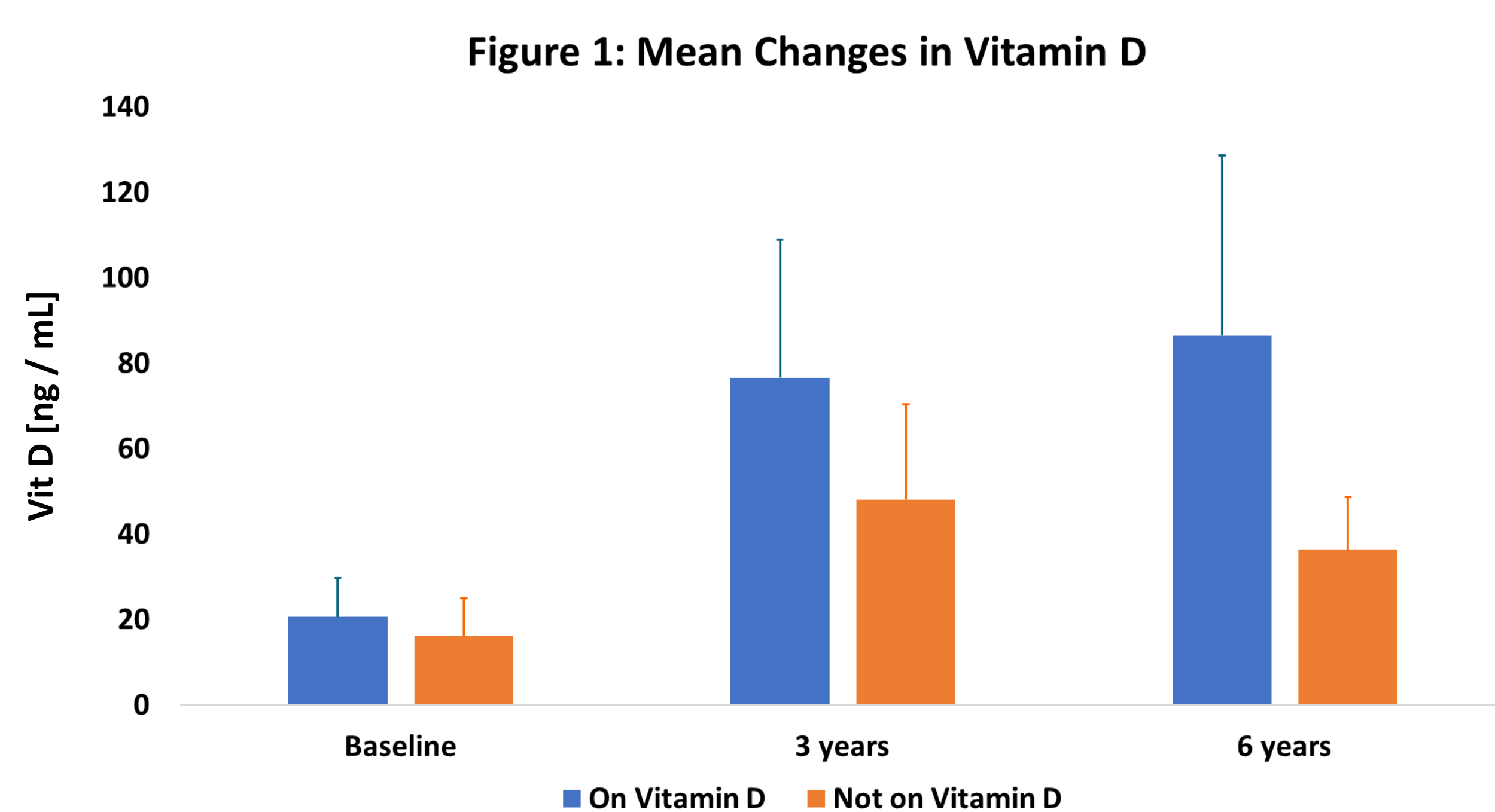
- High prevalence of vitamin-D deficiency and abnormal bone mineral density (BMD) reported in HIV patients.
- We aimed to find out effect of low dose oral vitamin-D on vitamin-D level, parathyroid hormone (PTH) level and BMD of spine and hip in HIV patients who has vitamin-D deficiency.

Methods

- We collected information about demography, viral load, CD-4 count, risk factors for fracture, treatment history and measured vitamin-D (25-OH), PTH (intact PTH), inorganic phosphate, corrected calcium, Alkaline phosphatase (ALP) and BMD of spine and hip at baseline, annually for 6 years.

Results

- Total 86 patients with mean age 48.8 (+/-8.7) years, 64 (74%) black African, 48 (55%) females, CD-4 count 540.7 (+/-180.8) cells/dL, plasma VL 1.6 log (+/-2.3) copies/mL, duration of illness 108.9 (+/-34.1), exposure to antiretroviral 96.2 (+/-27.9) months were included in the analysis. Patients on tenofovir had higher PTH (0.001), on efavirenz lower vitamin-D (0.03), but no difference in BMD of spine or hip.



- After 6 years of follow up patients **on vitamin D replacement** (n=44) had significant increase in vitamin-D baseline (20.6 +/- 9.7) after 3 years (76.6 +/- 32.2) and after 6 years (86.4 +/- 42.2 p=0.0001), (Figure 1).
- Reduction in PTH baseline (7.9 +/- 6.5) after 3 years (3.9 +/- 1.6) and after 6 years (3.1 +/- 1.9 p=0.02), (figure 2).
- Reduction in alkaline phosphatase (108 +/- 73.71 vs. 95.9 +/- 52.4 p=0.03) and increase in corrected calcium levels (2.1 +/- 0.1 vs. 2.2 +/- 0.08 p=0.01).
- But no change in BMD of hip baseline (0.961 +/- 0.18) after 3 years (1.021 +/- 0.011) and after 6 years (1.001 +/- 0.11, p=0.07) (figure 3).
- No change in BMD of spine baseline (0.981 +/- 0.22) after 3 years (1.014 +/- 0.012) and after 6 years (1.014 +/- 0.12, p=0.08) (figure 4).
- In patients **not on vitamin-D replacement** (n=42), there was increase in vitamin-D baseline (16.0 +/- 8.9) after 3 years (48.1 +/- 22.2) and after 6 years (36.3 +/- 12.4, p=0.01)
- But PTH, ALP, corrected calcium and BMD of hip and spine did not change.
- In multivariate analysis that included all significant variables, vitamin-D replacement independently associated with increase in vitamin-D level (OR 2.08, CI 1.03, 4.12, p=0.005), decrease in PTH level (OR 0.53, CI 0.35, 0.82, p=0.04), but not with change in corrected calcium, alkaline phosphatase.

Conclusion

- After 6 years of follow up, replacement of low dose once daily oral vitamin-D in treatment experienced HIV patients with vitamin-D deficiency can increase vitamin-D level, reduce PTH level with no changes in BMD of hip and spine.
- Further randomized controlled trial with larger number of patients and longer follow up may add more light in this area.