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INTRODUCTION

•Osteopenia is a recently described adverse event in HIV-infected patients that may a be side effect of protease inhibitor (PI) therapy.

•Osteopenia and osteoporosis are also a well-described sequelae of menopause and normal aging in women.

•To date, no studies have described the prevalence of reduced bone mineral density (BMD) in older, peri- and postmenopausal HIV-infected women.

METHODS

•Bone densitometry scans of the lumbar spine, hip, and total body were performed in 40 peri- and post-menopausal women using a Hologic DEXA scanner.

•Subjects included 19 HIV-infected and 21 HIV-uninfected women.

•By design, 50% of subjects were post-menopausal (defined as age >40 and no menses in past one year), and 50% were peri-menopausal (defined as age>35 and irregular menses, or age>40 and regular menses).

•Data on protease inhibitor and other antiretroviral therapy use were collected by self-report at the time of DEXA scanning.

•Recent (within 18 months of DEXA scan) CD4 and viral load values were available for 14/19 (73%) of HIV-infected women.

RESULTS

•Sociodemographic and clinical characteristics of study subjects are shown in Table 1. Among all subjects, the mean age was 48 y (range 35-55).

•Among HIV-infected women, all had taken antiretroviral therapy and 55% (n=11) had taken protease inhibitors. The median duration of PI therapy was 48 months.

•The prevalence of abnormal bone density (T-score of the spine, femoral neck, or total body less than 1.0 SD below the mean) is shown in Figure 1. Both post-menopausal status and older age were associated with reduced bone mineral density (OR=1.08 per year, p=0.2), but this association was not statistically significant.

• HIV infection was not associated with reduced bone mineral density.

•Among HIV-infected women, protease inhibitor use was associated with the highest prevalence of abnormal bone mineral density (56% v 13% for PI non-users, p=0.05).

•Mean BMD and T-scores of the lumbar spine, femoral neck, and total body are shown in Table 2.

•Figures 2-5 show the distribution of BMD and T-scores of the lumbar spine and femoral neck by HIV status and, among HIV-infected women, by PI use. The box in each figure represents the interquartile range, the thick line represents the median, and the thin lines represent the range of values. Among HIV-infected women, lumbar spine BMD and t-score were significantly lower for women who had ever taken protease inhibitors ($p \leq 0.05$).

Table 1: Subject Characteristics

	All Subjects (n=40)	HIV-negative (n=21)	HIV-pos PI user (n=11)	HIV-pos PI non user (n=8)
Age (y, mean ± SD)	48.2 ± 5.8	48.2 ± 7.7	46.1 ± 4.8	49.0 ± 5.4
Race (%)				
Black	49	60	75	32
Hispanic	32	40	13	37
White	19	0	13	32
Weight (kg, mean ± SD)	72.5 ± 15.9	68.7 ± 14.4	69.5 ± 18.7	75.5 ± 15.6
CD4 (median, range)			399 (185-595)	237 (134-1029)
Viral load (median, range)			50 (150-36,090)	2410 (50-42,220)
Ever on antiretrovirals (%)			100	75
Time on PIs (mos, median, range)			48 (2-96)	

Figure 1: Effects of menopause, HIV, and PI use on BMD

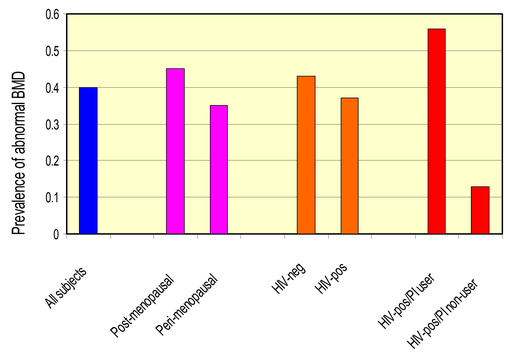


Table 2: Mean BMD and T-scores

	All Subjects (n=40)	HIV-negative (n=21)	HIV-positive (n=19)	HIV-pos PI user (n=11)	HIV-pos PI non user (n=8)
Lumbar Spine BMD	1.20	1.19	1.22	1.15	1.30
Lumbar Spine T-score	0.01	-0.09	0.12	-0.41	0.84
Femoral Neck BMD	0.97	0.98	0.10	0.95	1.06
Femoral Neck T-score	0.03	-0.02	0.09	-0.32	0.09
Total Body BMD	1.18	1.18	1.18	1.15	1.22
Total Body T-score	0.71	0.78	0.78	0.36	1.07
% with abnormal BMD (T-score ≤-1.0)	40	43	37	56	13

Figure 2: Lumbar spine BMD and PI use

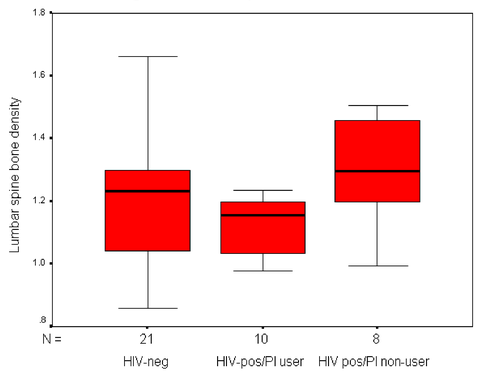


Figure 3: Femoral neck BMD and PI use

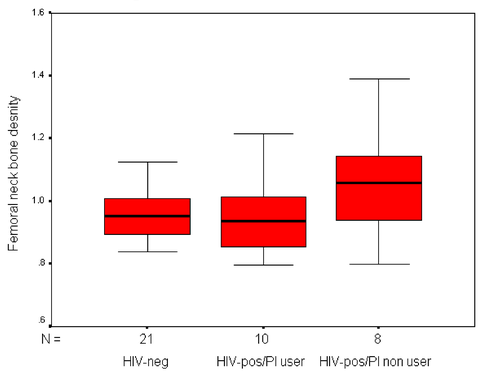


Figure 4: Lumbar spine T-score and PI use

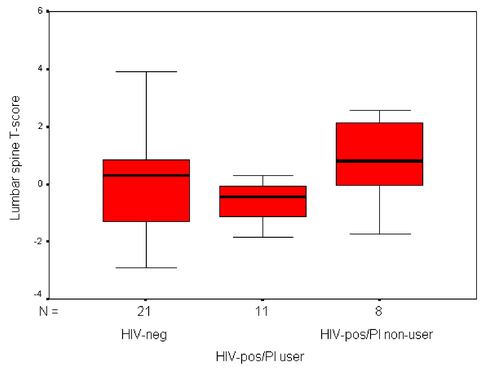
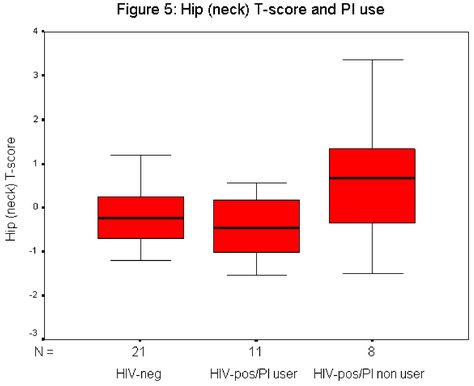


Figure 5: Hip (neck) T-score and PI use



CONCLUSIONS

•In this small sample of older per- and post-menopausal HIV-infected women and HIV-negative controls, we did not find an association between HIV infection and reduced bone mineral density.

•As expected, we observed a weak association between both older age and post-menopausal status and reduced bone mineral density

•Among HIV-infected women, ever use of a protease inhibitor was significantly associated with reduced bone mineral density, but we did not observe a statistically significant association between duration of protease inhibitor use and reduced bone mineral density.

•Treatment with protease inhibitors was associated with an unadjusted odds ratio (OR) of 8.4 (p=0.05) of having reduced bone mineral density. After adjustment for age, the OR was 7.5 (p=ns).

•Among HIV-infected women, we did not observe a relationship between either CD4 count or viral load and bone mineral density.

•Our study suggests that older HIV-infected women treated with protease inhibitors have a very high risk of having reduced bone mineral density. It is currently unknown whether this translates into an increased fracture risk for this population.