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Performance of Fracture Risk Assessment Tools in HIV-Positive Individuals Aged ≥45 Years Who Were Receiving Suppressive Antiretroviral Therapy

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Background

To guide management of patients with reduced bone mineral density (BMD), an age-specific evaluation and management algorithm is suggested for HIV-positive patients without major risk factors. Whether a combination of dual-energy x-ray absorptiometry (DXA) and FRAX may detect more individuals for therapeutic interventions remains unclear.

Methods

HIV-positive Taiwanese aged ≥45 years who received combination antiretroviral therapy (cART) were recruited. Patients with pregnancy, malignancy, AIDS status, pre-existing bone disease, or immobilization were excluded. Information on clinical and demographic characteristics, FRAX questionnaire, BMD, and serum 25(OH) Vit D was obtained. The physical activity was estimated from the short form of the International Physical Activity Questionnaire (IPAQ), Taiwan version, which was categorized into 3 classes: low (<600 MET-minutes/week), moderate (600-3000), and high (>3000). FRAX scores combined with BMD (FRAX/BMD) and without BMD (FRAX) were calculated. Subjects were separated on the basis of major risk factors for fragility fracture and age.

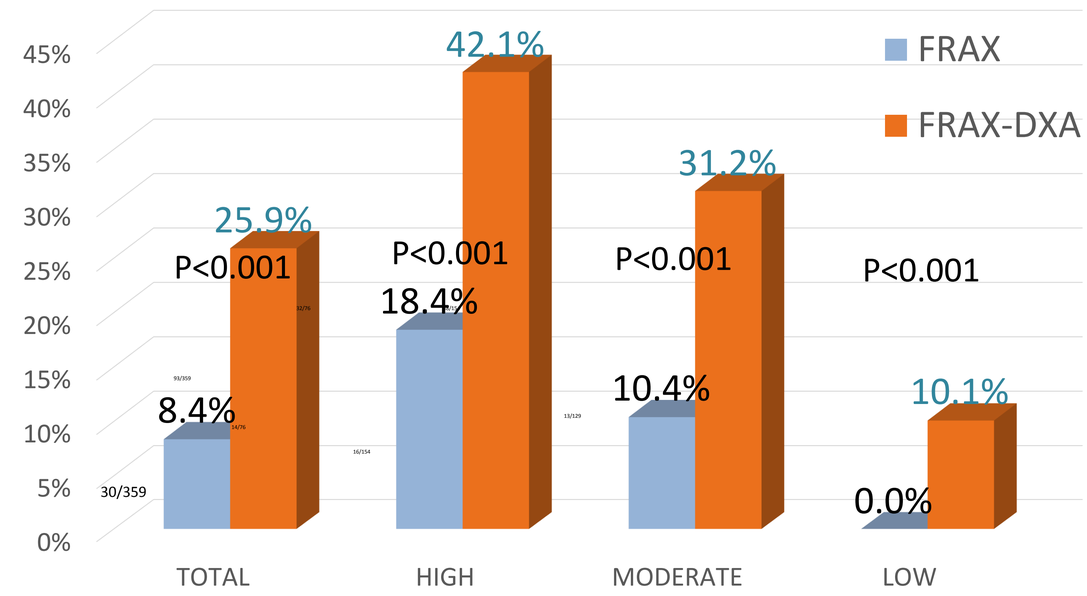
Table 1. Demographic and Clinical Characteristics.

	High , n=76	Moderate, n=154	Low, n=129
Age, median (Q1,Q3)	51.2 (47.7, 60.1)	55.7 (52.4, 61.9)	46.7 (45.6, 48.7)
Male, n (%)	71 (93.4))	130 (84.4)	129 (100)
Steroid≥5mg x 3 months, n (%)	10 (13.2)	0	0
Fragile fracture, n (%)	66 (86.8)	0	0
Menopause/Female	5/5	24/24	0
Smoking, n (%)	30 (39.5)	38 (24.6)	51 (39.5)
BH cm, mean (SD)	168.6 (7.4)	166.2 (7.7)	170.7 (5.1)
BW kg, mean (SD)	67.5 (11.4)	64.8 (11.3)	69 .0 (11.0)
Heterosexual sex, n (%)	24 (31.6)	59 (38.3)	12 (9.3)
Homosexual sex, n (%)	48 (63.1)	91 (59.0)	115 (89.1)
Intravenous drug use, n (%)	2 (2.6)	2 (1.3)	1 (0.8)
others, n (%)	2 (2.6)	2 (1.4)	1 (0.8)
CD4 Cell Count (/µL)	591.8 (226.2)	604.7 (275.8)	643.3 (243.3)
<20 copies per mL, n (%)	72 (94.7)	139 (90.3)	114 (88.4)
20-200 copies per mL, n(%)	4 (5.3)	15 (9.7)	15 (11.6)
TDF containing regimen, n(%)	71 (93.4)	141 (91.6)	119 (92.3)
PI containing regimen, n(%)	43 (56.6)	67 (43.5)	53 (41.0)

Results

359 HIV-positive patients were enrolled: 76 at high risk for fracture (with major risk factors for fragility fracture), 154 moderate risk (men age ≥ 50 years and all postmenopausal women without major risk factors), and 129 low risk (men age 45-49 years and without major risk factors) (table 1). The subjects with distinct risk had different results fulfilling treatment criteria: high-risk, 32 (FRAX/BMD) vs. 14 (FRAX) (difference 23.7%, 95% CI 9.6-37.8%), and intermediate-risk, 48 (FRAX/BMD) vs. 16 (FRAX) (difference 20.8%, 95% CI 12.0-29.5%), and low-risk, 13 (FRAX/BMD) vs. 0 (FRAX) (difference 10.1%, 95% CI 4.9-15.3%).(chart 1) Body-mass index (BMI) <22 kg/m2 was the factor of different assessment results fulfilling treatment criteria (OR 2.73, 95% CI 1.64-4.55). Of patients at high risk, BMI and low physical activity were predictors for the difference. BMI and aged >60 years or over were predictors in patients with intermediate risk.

Chart 1. Candidate for bisphosphonate therapy: T-score≤-2.5, FRAX score above>20% at a major osteoporosis site , or >3% at the hip



Conclusions

With DXA screening as a complementary approach, the FRAX may detect more candidates eligible for further investigations or therapeutic management. DXA for individuals with BMI <22 kg/m2, those with major risk factors and low level of physical activity, or those aged >60 years but without major risk factors can be higher on the priority list for investigations or therapeutic management.

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