

Similar Incidence of Osteopenia and Osteoporosis in Antiretroviral-Naïve Patients Treated with Tenofovir DF or Stavudine in Combination with Lamivudine and Efavirenz Over 144 Weeks

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Background

- Osteopenia and osteoporosis are observed in patients with HIV disease and have been linked to HIV infection itself or antiretroviral therapy
- Loss of bone mineral density occurs naturally around age 35 years at a rate of 0.5-1%/year¹
- Bone mineral density (BMD) of lumbar spine and hip, as measured by dual energy x-ray absorptiometry (DXA), is the standard method used to diagnose osteopenia and osteoporosis, with spine BMD being more sensitive to effects of drugs²
- Over 144 weeks in Study 903, both TDF and d4T arms experienced decreases in bone mineral density (BMD) which were similar at the hip but greater at the spine for the TDF arm³
 - Bone loss was not significantly different between women and men through 144 weeks⁴

Figure 1. Mean % Change in Hip BMD³

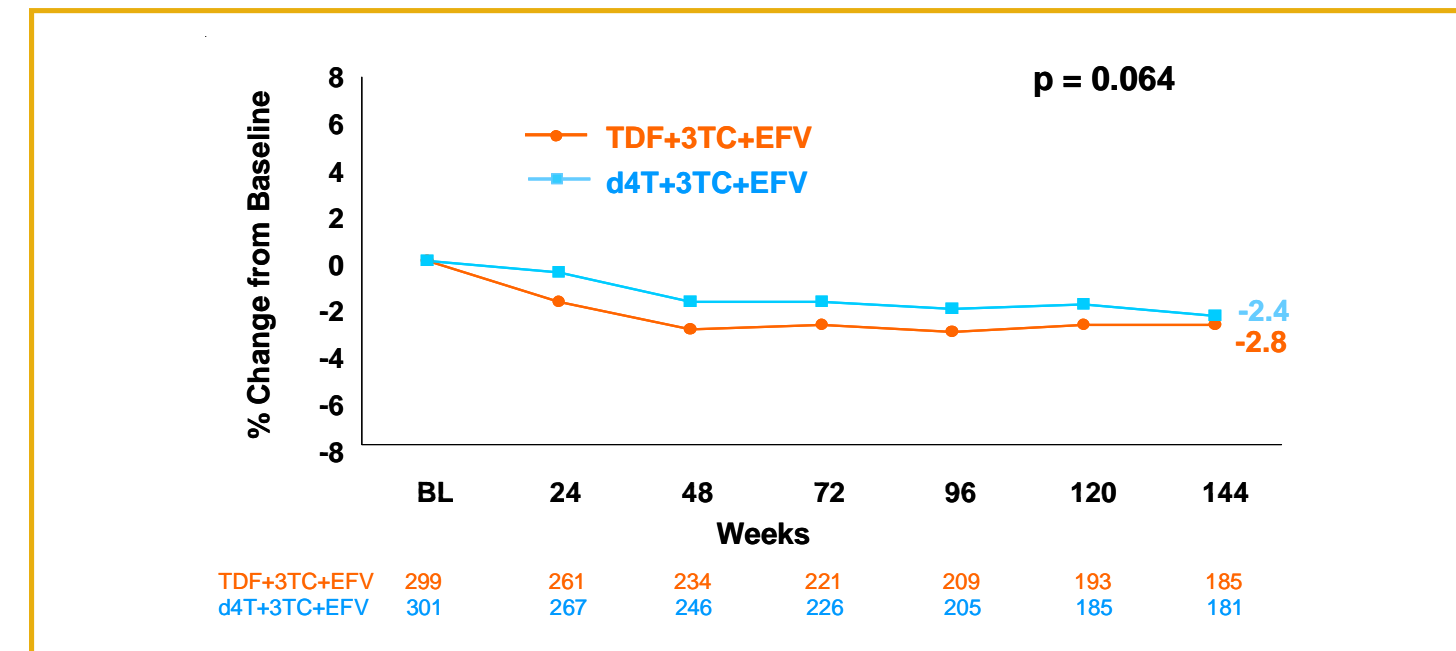
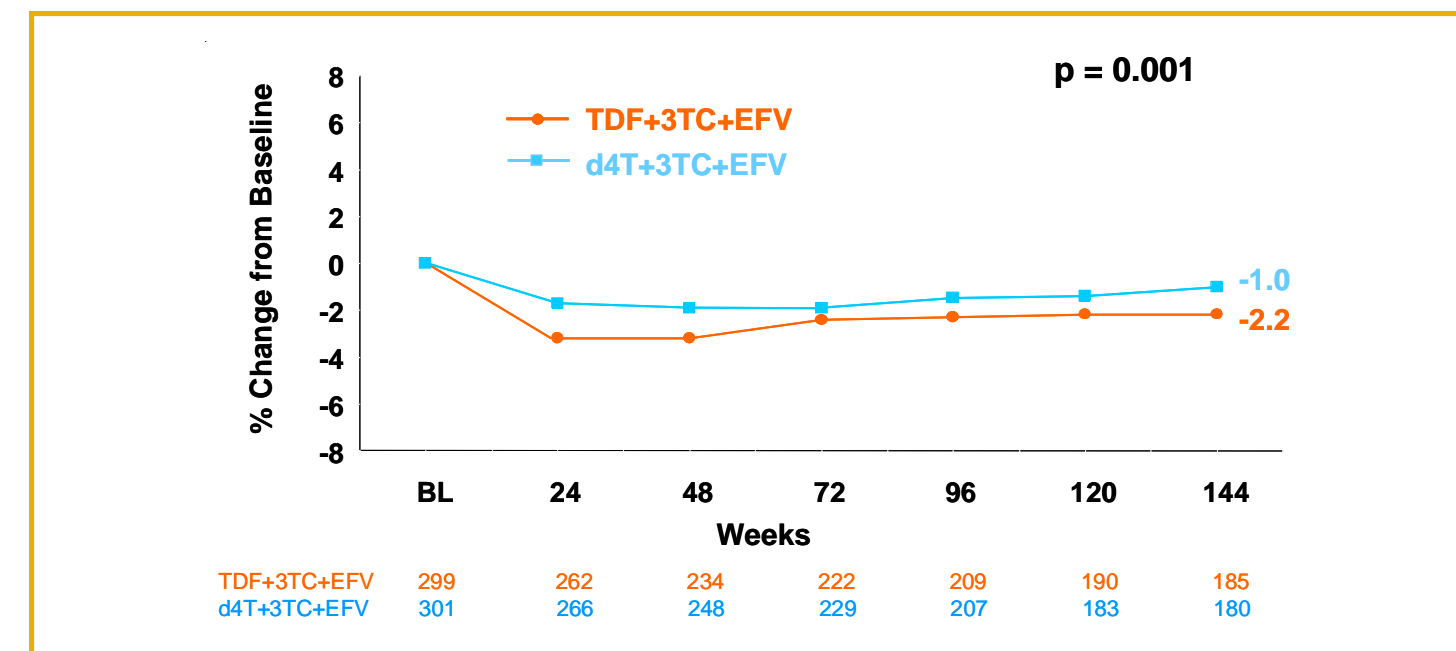
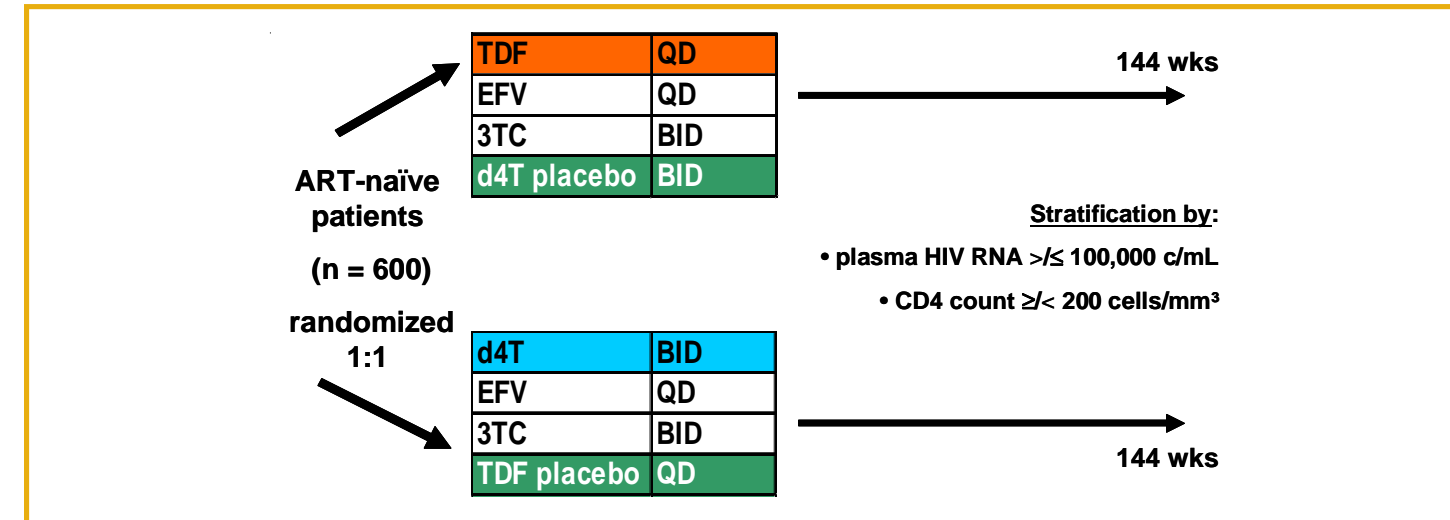


Figure 2. Mean % Change in Spine BMD³



Methods

Figure 3. Study Design: Randomization



- All patients underwent BMD measurements of the lumbar spine and hip by DXA at baseline and every 24 weeks
- Incidence of osteopenia and osteoporosis through measurements of spine BMD were evaluated at baseline and at week 144
- The WHO criteria for osteopenia (T-score: -2.5 to -1.0) and osteoporosis (T-score: < -2.5) were used for this analysis

Results

Table 1. Baseline Characteristics

	TDF + 3TC + EFV (n = 299)	d4T + 3TC + EFV (n = 301)
Mean Age in yrs (Range)	36 (19 to 61)	36 (18 to 64)
Female	26%	25%
Race		
Caucasian	64%	64%
Black	21%	18%
Hispanic	7%	8%
Asian	1%	2%
Other	7%	9%
Mean HIV-1 RNA (copies/mL)	81,300	81,300
HIV-1 RNA > 100,000	46%	43%
Mean CD4 cell count (cells/mm ³)	276	283
CD4 cell count < 200	39%	38%

Table 2. Summary of Spine Status at Baseline

	TDF + 3TC + EFV ^a (n = 299)	d4T + 3TC + EFV ^a (n = 301)
Normal	221 (74%)	206 (68%)
Osteopenia (T-score: -2.5 to -1.0)	70 (23%)	83 (28%)
Osteoporosis (T-score < -2.5)	8 (3%)	12 (4%)

a. p = 0.120 for comparison between treatment arms (CMH Row Mean Score Test)

Results (cont'd)

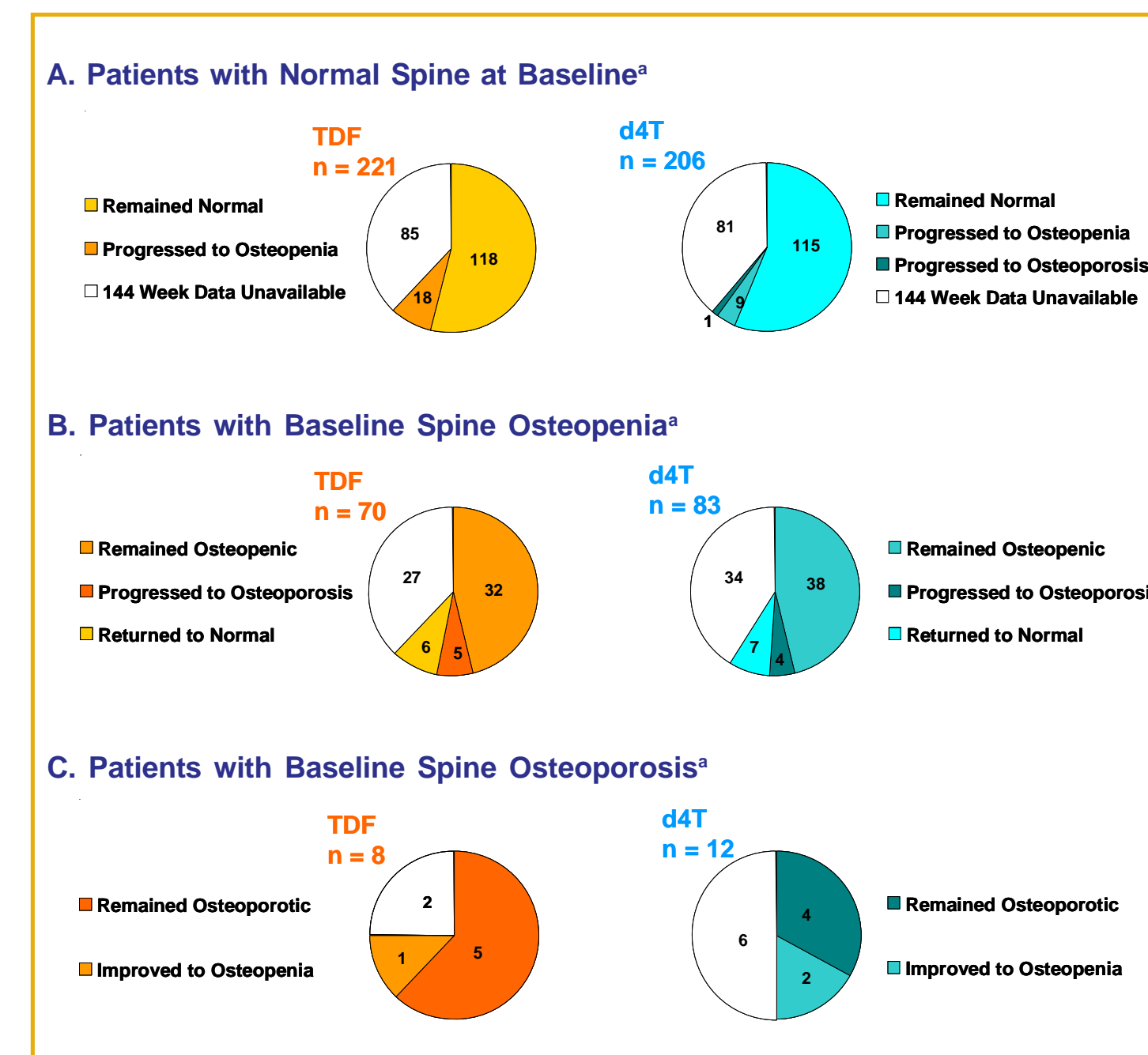
Table 3. Summary of Spine Status at Week 144

	TDF + 3TC + EFV ^a (n = 185)	d4T + 3TC + EFV ^a (n = 180)
Normal	124 (67%)	122 (68%)
Osteopenia (T-score: -2.5 to -1.0)	51 (28%)	49 (27%)
Osteoporosis (T-score < -2.5)	10 (5%)	9 (5%)

a. p = 0.850 for comparison between treatment arms (CMH Row Mean Score Test)

- In a linear regression analysis of baseline demographic characteristics, male sex, lower weight and older age at enrollment correlated with lower spine T-scores at baseline
- The proportion of women with baseline osteopenia or osteoporosis (18%) was comparable to the proportion of women (25%) in the overall study population

Figure 4. Outcome at Week 144



a. p = 0.190 for comparison between arms (CMH Row Mean Score Test)

Conclusions

- The high prevalence of spine osteopenia/osteoporosis at baseline in this population suggests that BMD loss may be a consequence of HIV infection
- Progression from normal/osteopenia to osteopenia/osteoporosis through 144 weeks was minimal and not significant between the TDF and d4T arms
- No patient with spine osteoporosis at baseline or at week 144 developed bone fractures
- No difference in the incidence of osteopenia and osteoporosis at the spine was observed between the TDF and d4T arms

References

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