Risk Factors, Screening, Diagnosis and Treatment of Osteoporosis in HIV-infected Adults in an HIV Primary Care Clinic

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Background

- HIV positive population is aging and with that comes emergent comorbidities such as osteoporosis (OP)
- People living with HIV have higher risk of low bone mineral density (BMD) and fragility fractures than those without HIV
- Lower BMD in HIV is in part explained by conventional risk factors and in part by HIV itself
  - Traditional risk factors are more common in HIV: low body weight, cigarette smoking, alcoholism, opiate use
  - HIV predisposes individuals to a pro-inflammatory state
  - Tenofovir disoproxil fumarate (TDF) and protease inhibitors (PI), frequently prescribed antiretrovirals, have been associated w/ OP
- Meta-analysis of adults living with HIV showed:
  - Decreased BMD in 67% of patients
  - OP prevalence of 15%; 3x greater than HIV-uninfected controls
- There are no validated screening tools in this population:
  - Dual-energy X-ray absorptiometry (DXA) screening is recommended in individuals ≥50 years old by the BC Centre for Excellence in HIV/AIDS Primary Care Guidelines
  - Fracture Risk Assessment Tool (FRAX) can also be used
- Treatment of OP for persons living with HIV is no different than the general Canadian population:
  - Calcium, vitamin D, lifestyle measures, bisphosphonates
- John Ruedy Clinic (JRC) at St. Paul's Hospital in Vancouver is a low-barrier multidisciplinary HIV primary care clinic
  - Despite often urgent needs in primary care, screening & treating chronic diseases such as OP is becoming a crucial part of care

Objective

- To assess osteoporosis risk factors, screening, diagnosis, and treatment for bone disease among patients with HIV over the age of 50 at a multidisciplinary HIV primary care clinic

Methods

- **Design**: Retrospective chart review
- **Study Period**: June 1, 2016 – June 1, 2019
- **Inclusion Criteria**:
  - HIV positive
  - Active JRC patients since June 1, 2016
  - ≥50 years old as of June 1, 2016
  - ≥1 follow-up appointment with JRC MD per year
- **Sample Size**:
  - Calculated for a clinic population size of 582 patients aged ≥50 using a confidence interval 95% with margin of error 7%
  - Sample size: 147 patients + 15% for attrition (N=170)
  - Random sampling (using Microsoft Excel)
- **Analysis**: Descriptive statistics

Results

Figure 1: Chart Inclusion Flow Diagram

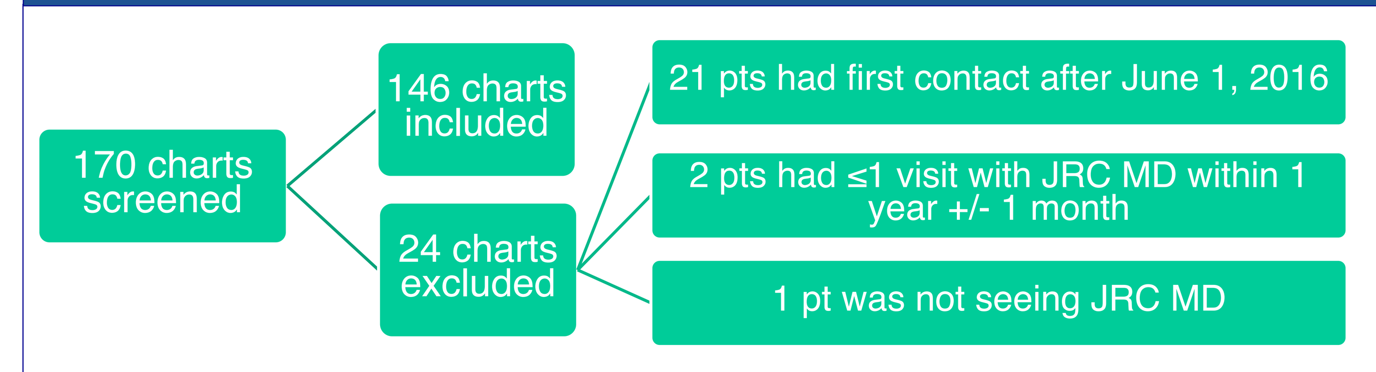


Table 1: Patient Characteristics and Risk Factors (N=146)

Characteristic		
Male		134 (91.8%)
Age (years), median (IQR)		55 (52-59)
Patients with at least 1 risk factor		145 (99.3%)
Number of risk factors, median (IQR)		3 (3-4)
Pts with risk factors included in FRAX		21 (14.4%)
FRAX Score	<10% (Low) 10-20% (Mod) >20% (High)	121 (82.9%) 20 (13.7%) 5 (3.4%)
Body Weight <60kg	Yes Not Charted	17 (11.6%) 10 (6.9%)
Ethnicity (Caucasian or Asian)	Yes Not Charted	124 (69.2%) 15 (10.3%)
History of Fragility Fractures	Yes Not Charted	18 (12.3%) 122 (83.6%)
High Risk of Falls	Yes Not Charted	5 (3.4%) 141 (96.6%)
Current Smoker	Yes Not Charted	46 (31.5%) 3 (2.1%)
Current Alcohol Use (>3 units/day)	Yes Not Charted	7 (4.8%) 40 (27.4%)
Glucocorticoid Use*>5mg prednisone or equiv >3mo	Yes	6 (4.1%)
Other Medications (with ↑ risk of OP)	Yes	137 (93.8%)
Comorbidities (with ↑ risk of OP)	Yes	80 (54.8%)
Malnourished	Yes Not charted	14 (9.6%) 132 (90.4%)
Inadequate Calcium Intake	Yes Not Charted	5 (3.4%) 134 (91.8%)
Vitamin D Deficiency	Yes Not Charted	3 (2.0%) 142 (97.3%)
Post-menopause'n=12	Yes Not Charted	3 (25%) 9 (75%)
Antiretrovirals (with ↑ risk of OP)	TDF only PI only TDF + PI	30 (20.5%) 32 (21.9%) 60 (41.1%)
CD4 Nadir <200 cells/uL	Yes Not Charted	64 (43.8%) 37 (25.3%)
HIV Related Neuropathy	Yes	16 (11.0%)
Duration of HIV (years), median (IQR)		15 (9-23)

Figure 2: Screening, Diagnosis and Treatment for Osteoporosis

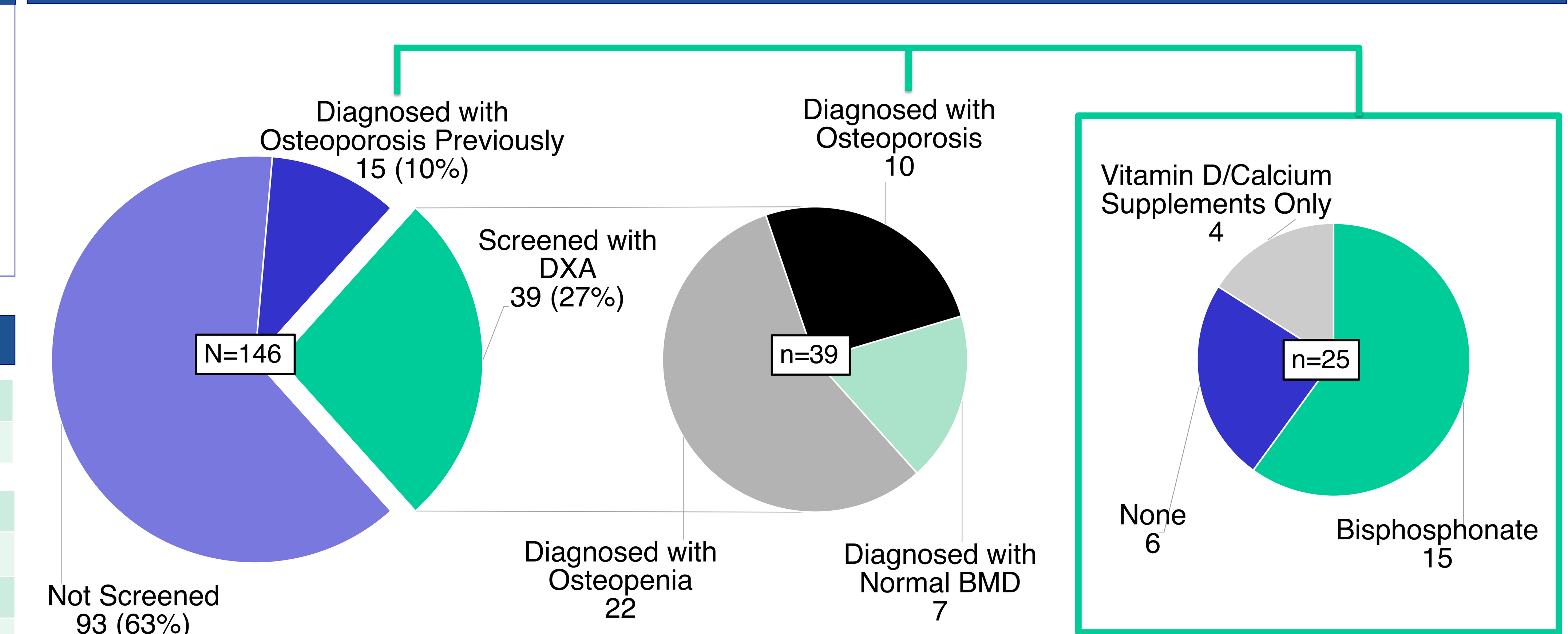
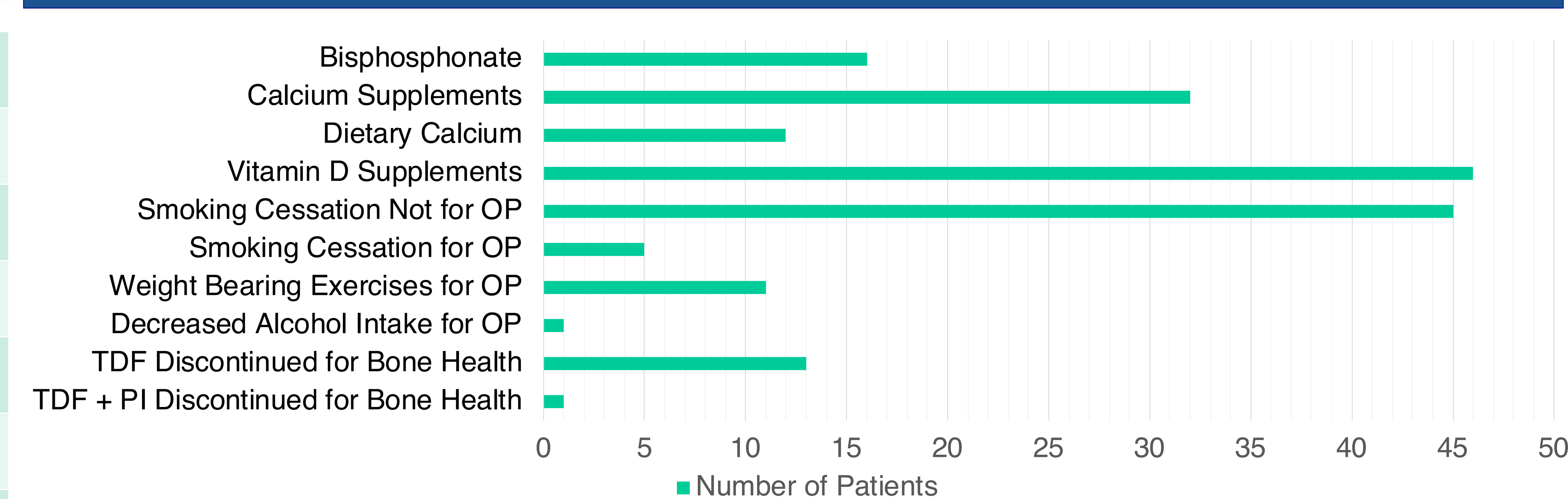


Table 2: Recommendations for Treatment Given for Bone Health for All Patients



Discussion

- Risk factors were pervasive in this HIV patient population
- Patients, if screened, were screened with a DXA
  - 2/3 patients were not screened for osteoporosis during this study period
- Osteoporosis was diagnosed in 17% of this patient population, which is on par with the literature
  - Prevalence may be higher due to large proportion of patients not screened
- Bisphosphonates were prescribed in 60% (15/25) of patients diagnosed with osteoporosis previously or during the study period
  - Guidelines recommend patients to be on a bisphosphonate unless there is a contraindication

Limitations

- Retrospective chart review
  - Restricted to what was documented in charts: screening and risk factors not consistently documented
- Limited generalizability: single center, low proportion of women

Conclusions

- Many patients at JRC ≥50 years old are at risk of osteoporosis
- A coordinated approach to screening and treatment using a multidisciplinary team could help with increasing screening and treatment of osteoporosis in this population of people living with HIV

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