INCREASED RISK OF OSTEOPENIA AMONG HIV-POSITIVE ADULTS AGES 18-49

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Abstract

OBJECTIVES: Bone loss is a common problem occurring among human immunodeficiency virus (HIV)-positive patients. Explanations for the bone loss are unknown. We estimated the prevalence of osteopenia among HIV-positive adults ages 18-49 versus matched HIV-negative adults, and ranked predictors for osteopenia in terms of their contribution to a prediction model.

METHODS: We conducted a cross-sectional study on the 2005-2010 National Health and Nutrition Examination Survey (NHANES). HIV-positive individuals were identified according to HIV antibody test. Bone mineral density (BMD) T-score of femur neck was calculated based on the mean and SD from data for non-Hispanic white females ages 20-29 from the NHANES III. Osteopenia was defined as T-score between -1 and -2.5; osteoporosis was defined as T-score less than -2.5. A cross-sectional study of 52 HIV-positive adults (N=46) and 138 HIV-negative adults (N=132) was conducted to estimate the prevalence of osteopenia and osteoporosis. A matched cohort of 52 HIV-positive and 138 HIV-negative adults at the same sex, age category and race was matched according to HIV antibody test, so the predictors do not necessarily mean risk factors. We used multiple logistic regression identified predictors of osteopenia among the matched cohort.

RESULTS: 52 HIV-positive individuals were identified in the matched cohort and 138 HIV-negative adults were included. The mean age of the matched cohort was 39.3±10.3 years, and 76.1% were male. No osteoporosis was observed in either case group or control group. The prevalence of osteopenia was 7.2% versus 1.7% among the cases compared to controls. Osteopenia occurred only among males in the cases and females in the control. Alcohol consumption (p<0.0001) was the strongest predictor of osteopenia, followed by activity intensity (p<0.0001), physical activity intensity (p=0.0007), and HIV itself (p=0.0026), after controlling BMI and smoking status.

CONCLUSIONS: HIV itself is a significant predictor for osteopenia, but due to lack of information on treatment history, it remains unclear if HIV medicine or treatment duration can increase the risk of osteopenia.

Methods

Study Design

- A cross-sectional study based on the 2005-2010 National Health and Nutrition Examination Survey (NHANES)

Study Population

- For estimating prevalence of osteopenia/osteoporosis: A cohort of HIV-positive adults ages 18-49 were identified according to HIV antibody test
- For ranking predictors for osteopenia/osteoporosis: A matched cohort of HIV-positive and HIV-negative adults at the same sex, age category and race

Results

- No osteoporosis was observed in either case group or control group. The prevalence of osteopenia was 7.3% versus 1.7% among the cases compared to controls
- Osteoporosis occurred only among males in the cases and females in the control. Alcohol consumption was the strongest predictor of osteopenia, followed by activity intensity, family history of osteoporosis, and HIV itself, after controlling BMI and smoking status.

Table 1. Characteristics of All Identified HIV-Positive Adults and the Matched Cohort

Table 2. Predictors for Osteopenia Based on Stepwise Multiple Logistic Regression

Conclusions

- HIV itself is a significant predictor for osteopenia; but due to lack of information on treatment history, it remains unclear if HIV medicine or treatment duration can increase the risk of osteopenia.

Limitations

- No follow-up data are available in the NHANES database, so the predictors do not necessarily mean risk factors.
- Some important variables were not included in the model due to lack of enough observations, such as calcium/vitamin D intake, concurrent medication, and alcohol consumption.

References


Background

- Bone loss may be up to 3 times more common among people with HIV than in the general population.1
- The traditional risk factors for bone loss including low body weight, smoking, and drinking alcohol are more common in the HIV populations.2
- However, it remains unknown the contribution of these factors to bone loss as well as how HIV itself is associated with the risk of bone loss.

Objectives

- To estimate the prevalence of osteopenia/osteoporosis among HIV-positive adults ages 18-49 versus matched HIV-negative adults
- To rank predictors for osteopenia/osteoporosis in terms of their contribution to a prediction model.