

Association Between Combined Nicotine and Opioid Dependence and Osteoporosis in Women: A Real-World Data Analysis

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Background:

Osteoporosis is the most common bone disease in the United States, with women exhibiting a higher prevalence compared to men. Chronic cigarette smoking and opioid use are each recognized as independent risk factors for osteoporosis. However, it is unclear whether these substances contribute an additive effect on the development of osteoporosis. Therefore, we hypothesize that women with a combined history of nicotine and opioid dependence have an increased odds of developing osteoporosis compared to those with nicotine dependence alone.

Design and Methods:

We conducted a retrospective case-control study using a psychiatric dataset from the IU School of Medicine-Evansville RWEdataLab (CRC/Sidus Insights), a U.S. electronic health record (EHR) database. Diagnoses were identified using ICD-10 codes for: nicotine dependence (cigarette-related), opioid dependence, and osteoporosis. Female patients with an osteoporosis diagnosis following documentation of both dependencies were included. Odds Ratios (ORs) were calculated to compare the likelihood of developing osteoporosis in patients with both dependencies compared to patients with nicotine dependence alone.

Results:

Nicotine dependence was more strongly associated with osteoporosis than opioid dependence alone (OR: 1.88; 95% CI: 1.32-2.68; N=153,539). Women with both nicotine and opioid dependencies had significantly higher odds of osteoporosis compared to those with nicotine dependence alone (OR: 5.99; 95% CI: 3.46-10.37; N=79,247). The order in which the dependencies developed did not significantly differ in association with odds of developing osteoporosis.

Conclusion and Impacts:

These findings suggests that women with a chronic history of nicotine use are more likely to develop osteoporosis than those with a history of opioid use. Furthermore, women with a co-occurring nicotine and opioid dependence may be more strongly associated with osteoporosis than nicotine dependence alone. Stratification by age was limited by sample size and may be a confounding variable. Future studies should adjust for age and explore these associations.