National Patterns in Osteoporosis Diagnosis and Management Following Vertebral Compression Fractures in Older Adults

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INTRODUCTION: Vertebral compression fractures (VCFs) are among the most common osteoporotic fractures and often represent the earliest clinical manifestation of underlying skeletal fragility. Despite their significance as sentinel events, VCFs are frequently under diagnosed and under treated in the context of osteoporosis. The aim of this study was to assess national trends in osteoporosis screening, diagnosis, and treatment following VCFs among older adults, and to identify care gaps that may limit effective secondary fracture prevention.

METHODS: A retrospective cohort study was performed using the TriNetX US Collaborative Network, a nationwide database of electronic health records. Patients aged 65 years and older diagnosed with a vertebral compression fracture (ICD-10 codes M48.5x and S22.0x/S32.0x, as appropriate) between 2015 and 2024 were included. Patients with polytrauma, malignancy-associated pathologic fractures, or less than one year of follow-up were excluded. The cohort was stratified based on the presence or absence of a documented osteoporosis diagnosis prior to the fracture. Patients with known osteoporosis were further categorized by pre-fracture anti-osteoporotic therapy (AOT) status and whether treatment was initiated post-fracture in those previously untreated. Patients without a known diagnosis were assessed for post-fracture bone density screening, and, if screened, stratified by test results. Descriptive statistics were used to evaluate rates of osteoporosis diagnosis, screening, treatment initiation, and DEXA positivity.

RESULTS: Among 60,452 older adults with VCFs, only 26.3% (15,919) had a documented osteoporosis diagnosis prior to the index fracture. Of these, 33.6% (5,348) were on AOT, while 76.1% (12,122) were untreated prior to the fracture event. In the previously untreated subgroup, only 14.1% (1,714) initiated AOT following the fracture. Among patients without a prior osteoporosis diagnosis (69.2%), only 16.2% received post-fracture bone density testing, with 62.0% (4,199) of those tested found to have osteoporosis. The majority (83.8%) of unscreened patients after VCF represented a missed opportunity for intervention. Rates of treatment initiation following new diagnosis were inconsistently recorded, highlighting additional care discontinuities.

DISCUSSION AND CONCLUSION: This national analysis identifies a major gap in osteoporosis management following vertebral compression fractures in older adults. Despite their strong association with underlying bone fragility, the majority of VCFs occurred in patients without a prior osteoporosis diagnosis, and most were not screened or treated post-fracture. Even among those with a known diagnosis, treatment uptake remained low. These findings emphasize the urgent need for systemic strategies, such as fracture liaison programs, EMR-based reminders, and integrated osteoporosis care pathways, to ensure appropriate screening and treatment following fragility fractures of the spine.