Gender and Racial Disparities in Osteoporotic Vertebral Compression Fractures: A National Analysis of Treatment Inequities (2017-2022)

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INTRODUCTION:

Osteoporotic Vertebral Compression Fractures (VCFs) disproportionately burden women and minorities, yet disparities in guideline-recorded care particularly vertebral augmentation remain poorly characterized. This study analyzes Medicare and National Inpatient Sample (NIS) data to quantify gender and racial differences in VCF incidence, procedural treatment, and hospitalization trends among older adults.

METHODS: We identified Vertebral Compression Fractures (VCFs) in adults ≥65 years (2017–2022) using ICD-10 codes for osteoporotic fractures (M80.08xA, M80.88xA) and traumatic vertebral fractures (S22.080A, S32.080A), along with CPT codes for vertebroplasty/kyphoplasty (22510–22514) from the CMS Medicare 20% sample (outpatient/ED visits) and NIS (inpatient admissions). Propensity-score weighting balanced comorbidities (Charlson Index), facility type, and regional practice patterns. Sensitivity analysis excluded pathologic fractures (M49.5). Outcomes included incidence, severe pain (VAS ≥7), hospitalization, and treatment disparities by gender and race.

RESULTS: Approximately 1.2 million osteoporotic vertebral compression fractures (VCFs) occurred annually among Medicare beneficiaries aged ≥65 years. Women demonstrated significantly higher incidence, with a 2.1-fold greater rate than men (IRR 2.10, 95% CI 1.98-2.23; $p<0.001$). After propensity-score adjustment incorporating comorbidities and healthcare utilization factors, procedural treatment rates showed no significant gender difference (8.2% women vs. 7.9% men receiving vertebroplasty/kyphoplasty; $p=0.34$). However, we observed substantial racial disparities, with Black patients having 46% lower adjusted odds of receiving vertebral augmentation compared to White patients (aOR 0.54, 95% CI 0.42-0.69). Women faced 15% higher adjusted odds of hospitalization (aOR 1.15, 95% CI 1.05-1.26), with this disparity magnified in rural and low-income subgroups. While severe pain prevalence (VAS ≥7) was similar between genders (38% women vs. 35% men; $p=0.22$), Black patients reported significantly higher pain scores than White patients (45% vs. 36%; $p<0.05$).

DISCUSSION AND CONCLUSION:

This national study of over 1.2 million annual osteoporotic VCFs reveals two critical disparities: (1) While vertebral augmentation use showed gender equity after risk adjustment, Black patients faced 46% lower odds of receiving these procedures than White patients, and (2) Women bore a double burden experiencing 2.1-fold higher fracture incidence and 15% greater hospitalization odds, particularly in underserved populations. The elevated severe pain reports among Black patients (45% vs 36% in Whites) despite fewer interventions highlights potential care access barriers. These findings underscore the need for: (1) Targeted initiatives to address racial disparities in fracture care, (2) Gender-specific prevention strategies for high-risk women, and (3) Pain management protocols addressing documented inequities. Our results directly support priorities on value-based spine care and fragility fracture prevention in vulnerable populations.