Forgetting the Frail: National Trends in Vitamin D Prescription Post Fragility Fracture

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INTRODUCTION:

Vitamin D is a critical modulator of bone growth and resorption. Prior studies (Doestsch et al. 2004 and others) found that low serum levels of 25-hydroxyvitamin D were associated with osteoporosis, fracture risk, and non-union . Orthopedic trauma patients commonly present with substantial vitamin D hypovitaminosis; however, supplementation can improve fracture healing and reduce risk of refractures (Clutton & Perera, 2015). Despite these benefits and interventional programs established through orthopedic and medical societies (ie. Own the Bone), espousing the benefits of vitamin D supplementation in high-risk populations, there is scant literature on the actual prescribing practices for vitamin D post fracture diagnosis. In this study, we sought to characterize the national trends for vitamin D prescription after common fragility fractures including hip fractures (HF), spinal compression fractures (SCF), and distal radius fractures (DRF) by year and region.

METHODS:

A national insurance database was queried for patients 50 years or older, diagnosed with a fragility fracture (HF, SCF, or DRF). These cohorts were analyzed for prescriptions of vitamin D within 3 months of diagnosis. Rates of vitamin D prescriptions were broken down by year prescribed (2010-2020) and geographic region (West, Northeast, and South). Rates of vitamin D prescriptions by year and region were compared using chi squared tests. Univariate analyses of factors associated with vitamin D prescription were performed. Multivariate analysis was subsequently performed controlling for all significant variables established through univariate analysis.

RESULTS:

887,591 hip fracture, 772,944 spinal compression fracture, and 558,479 distal radius fracture patients aged 50 years or older were identified. From 2010 to 2020 the rate of vitamin D prescriptions post HF, SCF, and DRF increased. A patient seen in 2020 was significantly more like to received a vitamin D prescription for a HF (1.83x), SCF (1.45x), or DRF (1.21x) than a patient seen in 2010 for the same injury ($p < 0.001$). In the multivariate analysis, patients from the West were less likely than those from other regions to have received a vitamin D prescription post fracture (OR: 0.86, $p < 0.001$).

DISCUSSION AND CONCLUSION:

The current study demonstrates that the rate of vitamin D prescriptions post fragility fracture diagnosis have increased over the past decade. Additionally, patients from Western states are significantly less likely to receive a prescription post-fracture than patients from other geographic areas. Further studies exploring the role of concomitant osteoporosis diagnoses affecting vitamin D prescription and understanding barriers to prescription patterns for vitamin D supplementation are needed. Studies have found that approximately 42% of the U.S general population to be vitamin D deficient, with rates of hypovitaminosis sharply increasing in elderly patients. Given the prevalence of hypovitaminosis, the current rate of vitamin D supplementation post-fracture in patients over 50 years of age (5.22%) is concerningly low.

Overall, there continues to be increased adoption of Vitamin D prescriptions for fragility fractures as illustrated by the data from 2010-2020. Unfortunately, these rates remain low (5.22%) and continue to present an opportunity for improvement in patient care and optimization of patient recovery following fragility fractures.