Atypical Femur Fractures due to Antiresorptive Medications More Commonly Affect the Femoral Shaft versus Subtrochanteric Femur

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INTRODUCTION: Atypical femur fractures (AFF) are a rare but well-documented complication of antiresorptive medication in the treatment of osteoporosis. These fractures most commonly occur in the diaphysis of the femur, with the subtrochanteric region thought to be the most common anatomic location involved. The purpose of this study is to determine the incidence of atypical femur fracture patterns associated with the use of bisphosphonates, denosumab, romosozumab, abaloparatide, and teriparatide.

METHODS: A retrospective cohort analysis of the TriNetX database (TriNetX, Cambridge, MA) was performed by querying all patients diagnosed with an atypical femoral fracture within 2 years of taking abaloparatide, teriparatide, bisphosphonates, denosumab, or romosozumab. ICD-10 codes were used to distinguish the anatomic location of the fracture, including the femoral shaft or subtrochanteric femur.

RESULTS:

In patients with AFF taking either abaloparatide, teriparatide, bisphosphonates, denosumab, or romosozumab, 13.5% (108 of 801 patients) experienced atypical femoral shaft fractures, while 9.4% (75 of 801 patients) experienced atypical subtrochanteric femur fractures (p = 0.0095). For patients only taking bisphosphonates who experienced an atypical femur fracture, 16.8% (60 of 358 patients) were found to have atypical femoral shaft fractures compared to 11.2% (40 of 358 patients) atypical subtrochanteric femur fractures (p = 0.031). There was no difference in rates for patients only taking denosumab (15.7% vs. 14.3%, p = 0.81) or only taking abaloparatide or teriparatide (16.9% vs. 16.9%, p = 1.00). There were no fractures of either type for patients on romosozumab only (0 of 10 patients).

DISCUSSION AND CONCLUSION:

The incidence of atypical femoral shaft fracture was found to be higher than atypical subtrochanteric fracture for patients taking bisphosphonates or any combination of bisphosphonates, abaloparatide, teriparatide, denosumab, or romosozumab. However, there appeared to be no difference for patients taking only abaloparatide or teriparatide, or only denosumab. This indicates that the femoral shaft is the more common anatomic location for AFF in patients taking antiresorptive osteoporosis medication, particularly bisphosphonates.