

**Treatment of Hypovitaminosis D in an Orthopaedic Trauma Population***Brendan Andres<sup>1</sup>; Benjamin Childs, BS<sup>1</sup>; Anna Wallace, MD<sup>1</sup>; Heather Vallier, MD<sup>2</sup>;**<sup>1</sup>MetroHealth System Cleveland, Ohio, USA;**<sup>2</sup>Metrohealth Medical Center, Cleveland, Ohio, USA*

**Purpose:** The purposes of this study were to (1) determine the incidence of hypovitaminosis D in an urban trauma population and (2) evaluate a vitamin D supplementation intervention strategy. We hypothesized that if given a free sample, patients would exhibit high adherence and their vitamin D levels would become sufficient.

**Methods:** 62 consecutive skeletally mature patients were treated surgically over 4 months for acute fractures of the pelvis or extremities by one traumatologist. Baseline calcium and vitamin D intake was recorded, and vitamin D levels were measured, serving as our initial study group to determine the prevalence of hypovitaminosis D. Subsequently, 144 patients were treated by the same surgeon for acute fractures, serving as the intervention group. All patients were prescribed 600 mg calcium and 800 U vitamin D3 capsules to take twice daily. For those patients discharged to home, they were provided with a free bottle (6-month supply) of calcium/D supplement with instructions. Vitamin D levels were obtained at time of injury and after approximately 6 to 8 weeks of supplementation. Patients were surveyed in the outpatient clinic to determine adherence to the supplement, dietary intake of vitamin D, and exposure to the sun.

**Results:** 62 consecutive patients, including 34 men and 26 women, with mean age 55 years (range, 19-95) were all deficient for vitamin D, except two (3.2%) who were taking supplements prior to injury. Mean baseline level was 17.4 ng/mL (sufficient is >30ng/mL). The intervention group (n = 144) consisted of 91 men and 53 women, with mean age 45 years (range, 14-98), and mean body mass index 28.1 (range, 16.1-47.4). Ethnicity was 69% Caucasian, 26% African American, and 2.1% Hispanic. Most common mechanisms of injury were motor vehicle collision 47%, low-energy fall 25%, and fall from height 15%. Mean baseline vitamin D level in the intervention group was 19.9 ± 11.4 ng/mL. Ten (6.9%) were taking vitamin D prior to injury, and 80% of them had a sufficient level. All others (mean baseline level 16.9 ± 6.9 ng/mL) were prescribed calcium and vitamin D and were offered free supplements when discharged to home. 77 patients completed surveys, and mean vitamin D level (n = 74) was 36.3 ng/mL after a mean of 10.4 weeks of supplementation (P <0.0001). 79% reported adherence or partial adherence to supplement recommendations. All adherent patients had achieved normal vitamin D levels at follow-up. 16 patients were nonadherent, with 10 who forgot to take the supplement, and 6 choosing not to take the supplement.

**Conclusion:** Hypovitaminosis D was present in 100% of our orthopaedic trauma patients who were not already taking vitamin D supplements. The intervention was effective in decreasing the prevalence of hypovitaminosis D within several weeks, with all supplemented patients achieving normal levels. 79% of patients adhered to recommendations. Further study to determine the long term cost-effectiveness of this strategy appears warranted.