The Five-Year Baseline Prevalence of Metabolic and Endocrine Bone Disorders in Patients Undergoing Short Spinal Fusion for Degenerative Disc Disease

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INTRODUCTION: Spinal fusion (SF) for degenerative disc disease (DDD) is a common orthopaedic procedure. Negative outcomes in SF secondary to low bone density are well described, as a recent study found that 51% of females >50 years undergoing spinal surgery have a diagnosis of osteoporosis (OP). However, there exists a paucity of literature concerning the prevalence of metabolic bone diseases (MBDs) in patients undergoing SF for DDD. Also, little is known about the etiologies of MBDs in DDD patients across different demographic subgroups. We hypothesized that prevalence of MBDs in the DDD patient population would increase as patients became older and that females would experience significantly higher rates of MBDs compared to males.

METHODS: The New York Statewide Planning and Research Cooperative System (SPARCS) database was queried to identify all DDD patients from 2009 to 2013. Patients were compared by age (<45, 45-64, and >64 years old), gender (male/female), and race (White, Black, Hispanic, Other). MBD diagnoses were recorded for each group, including OP, vitamin D deficiency (VDD), postsurgical hypothyroidism (PHT), glucocorticoid deficiency (GD), nontoxic uninodular goiter (NUG), and sickle cell trait (SCT). The respective prevalences of the latter were calculated.

RESULTS: A total of 21,069 patients were identified. The most prevalent MBDs in the DDD population were OP (5.3%), VDD (1.6%), PHT (0.8%), NUG (0.4%), and GD (0.3%). Each age range varied in the prevalence order of MBDs. Most common for the <45 years old group were VDD 0.8% and OP 0.4%, while OP was the most common MBD among 45-64 years old (OP 3.4%, VDD 1.6%) and >65 years old (OP 13.5%, VDD 2.4%). The OP rate in each age range significantly differed from the other two (0.4 vs. 3.4 vs. 13.5%; all, $p<0.05$). Females experienced higher rates of the 5 most common MBDs compared to males (OP 8.7 vs. 1.4%; VDD 2.1 vs. 0.9%; PHT 1.2 vs. 0.3%; GD 0.4 vs. 0.2%; NUG 0.5 vs. 0.2%) (all, $p≤0.01$). OP was the most common MBD across all races (White 6.0%, Black 2.2%, Hispanic 3.2%, and Other 4.2%). White patients had significantly higher OP rate than Black or Hispanic patients ($p<0.05$). VDD was the second most prevalent in all races (White 1.6%, Black 2.9%, Hispanic 0.8%, and Other 1.4%), with Hispanics having lower rates of VDD than Whites and Blacks ($p<0.05$). Top prevalence rates compared across age, sex, and race cohorts can be found in Table 1.

DISCUSSION AND CONCLUSION: Our data supports current literature showing OP and VDD as the most common MBDs in the general population. This study shows that for all demographic subgroups except patients <45 years of age, OP is the most common MBD.