26 HYPOPHOSPHATEMIA IS ASSOCIATED WITH NEPHROGENIC SYSTEMIC FIBROSIS: A CASE-CONTROL STUDY

Elana J. Bernstein,[1] Tamara Isakova,[2] Mary E. Sullivan,[3] Lori B. Chibnik,[4] Hasan Bazari,[3] Myles S. Wolf,[2] Jonathan Kay[5] *[1]Hospital for Special Surgery, New York, NY, USA; [2]University of Miami Miller School of Medicine, Miami, FL, USA; [3]Massachusetts General Hospital, Boston, MA, USA; [4]Brigham & Women's Hospital, Boston, MA, USA; [5]University of Massachusetts Medical School, Worcester, MA, USA*

10.1136/annrheumdis-2011-201237.26

Background Nephrogenic systemic fibrosis (NSF) manifests as hardening, tethering and hyperpigmentation of skin; flexion contractures of joints; and extracutaneous fibrosis in individuals with chronic kidney disease (CKD) following exposure to gadolinium-based contrast agents (GBCA) during imaging procedures. Given that not all patients with CKD exposed to GBCA develop NSF, additional factors must be involved in its pathogenesis. Preliminary evidence suggests there may be derangements of calcium and phosphorus metabolism in patients with NSF. Fibroblast growth factor 23 (FGF23) is a phosphorus and vitamin D regulating hormone. FGF23 levels increase markedly as GFR decreases. Whether FGF23 excess contributes to the development of NSF is unknown.

Purpose This study investigated potential factors in addition to GBCA exposure that may be involved in the pathogenesis of NSF. The authors hypothesised that, compared to patients with stage 5 CKD who do not have NSF, those with NSF would manifest greater alterations in calcium, phosphorus and FGF23 levels.

Methods Twenty-nine adult subjects with stage 5 CKD undergoing hemodialysis or peritoneal dialysis were recruited from outpatient nephrology and rheumatology practices. Subjects were excluded if they had a history of a phosphate wasting disorder or untreated primary hyperparathyroidism. Cases consisted of 10 patients with stage 5 CKD and biopsy-proven NSF. Controls consisted of 19 patients with stage 5 CKD without NSF, nine of whom had never previously been exposed to gadolinium. Cases and controls were matched for age and sex. Blood was collected from all 29 subjects and analysed for phosphorus, calcium, FGF23 and 25-hydroxy-vitamin D levels, in addition to other routine laboratory tests. Statistical analysis was performed using the student's t-test for differences in phosphorus, calcium and 25-hydroxy-vitamin D levels between the two groups, and the Wilcoxon test for differences in FGF23 levels.

Results Subjects were predominantly male (62%), and the majority identified themselves as Caucasian (79%). The mean age of subjects was 63 years (SD 12). Patients with NSF had significantly lower phosphorus levels compared to controls (3.4 ± 0.87 mg/dl vs 4.49 ± 1.05 mg/dl, p=0.01). Accounting for the use of phosphate binders did not alter these results.

There were no significant differences in mean calcium (9.53 ± 0.92 mg/dl vs 9.64 ± 0.58 mg/dl, p=0.70), mean 25-hydroxy-vitamin D (29.53 ± 23.90 ng/ml vs 26.90 ± 15.00 ng/ml, p=0.74), or median (Q1-Q3) FGF23 (6744.0 (2984 - 10679) RU/mL vs. 5539.5 (3357 - 11989) RU/mL, p = 0.77) levels between NSF patients and controls.

Conclusion This case control study suggests that differences in phosphorus metabolism may exist between patients with stage 5 CKD and NSF compared to patients with stage 5 CKD without NSF. Further study of the possible pathogenic role of altered phosphorus handing in the development of NSF is therefore needed.