Is Hypertension Associated with Increased Urinary Calcium Excretion in Patients with Nephrolithiasis?

Introduction and Objectives: The epidemiological relationship between nephrolithiasis (NL) has been investigated in details in the last 25 years and is well–known. Several studies show an increased risk of incident NL in patients (pts) with hypertension (HT) while others reveal an increased risk of HT in those with NL. We examined the relationship between HT and 24–hour urine composition in pts with NL.
Materials and Methods: We retrospectively reviewed a database of 24-hour urinalysis. Pts who presented for an initial metabolic stone assessment and were 18 years old or older, were identified and included in the study. Outpatient clinic and hospital records and 24 hours uric composition data were analyzed. BMI was calculated in kg/m2 from self reported pts height and weight at 24 hour urine collection. Pts were categorized with HT in they met 2 criteria, including 1) HT was listed in the medical history of the medical records and 2) they were on at least 1 anti- hypertensive medication, eg ß-blocker, calcium channel blocker, thiazide, angiotensin converting enzyme inhibitor or angiotensin II receptor blocker. Nominal logistic regression was also done to examine the HT prevalence by quintile of calcium and citrate excretion. Pts were excluded from study if BMI or medical history could be not be obtained or 24-hour urine collection was deemed inadequate.
Results: Of 148 pts analyzed, 51 (34.5%) had a baseline diagnosis of HT and 97 (65.5%) did not. HT pts were older (mean age ±SD 57.3 ± 10.7 vs 47.5±11.6 yrs, $p<0.001$) and had greater BMI (27.7 ±5.1 vs 25.9± 5.9 kg /m2 ,$p=0.003$). On adjusted multivariate analysis compared with normotensive stone formers those with HT excreted 26.2 mg per day more urine calcium, corresponding to a 13 % increase in urinary calcium excretion. The relative risk of HT was significantly associated with quintile of calcium excretion but not with quintile of citrate excretion (1.27,95 % CI, 1.03 to 1.63 vs 0.93, 95%CI , 0.79 to 1.16).
Conclusion: These findings suggest a potential common physiological pathway linking the 2 diseases. In pts with NL- HT appears to be related to increased urinary calcium excretion but not to urinary citrate excretion. This association is important when treating pts with NL since those with HT may require unique dietary and medical therapy.