MP04-18 ASSOCIATION OF OBESITY WITH INCREASED ENDOGENOUS OXALATE SYNTHESIS

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Introduction

Urinary oxalate levels are affected by both dietary and endogenous components. Prior studies have demonstrated the positive correlation between weight/body mass index (BMI) and urinary oxalate excretion. Our objective was to determine if this association is secondary to increased endogenous oxalate synthesis.

Methods

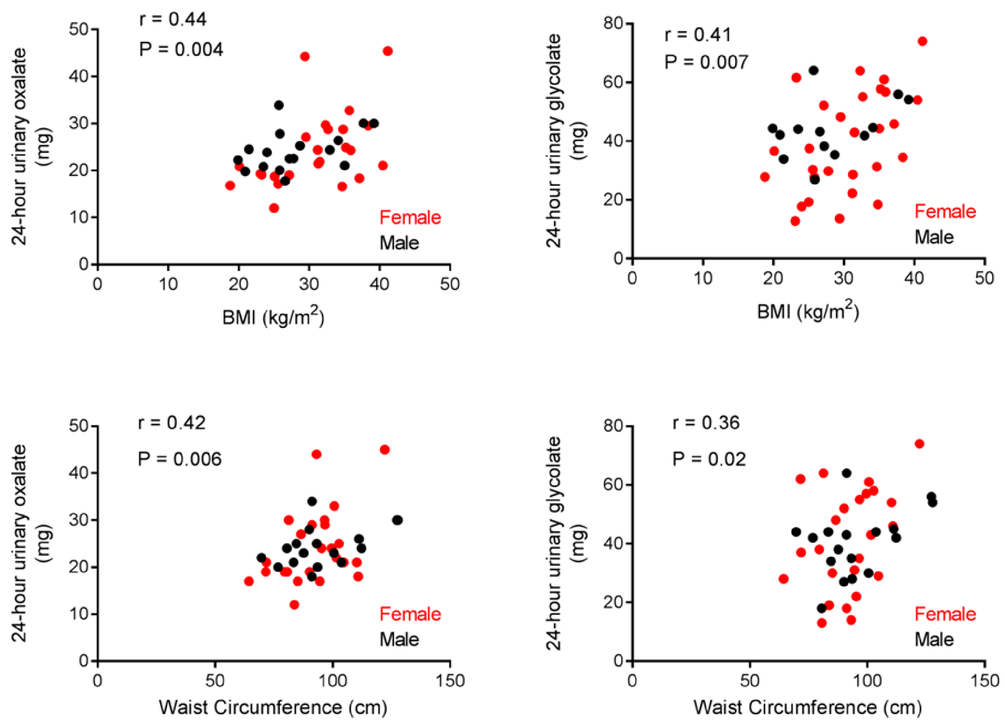
Healthy subjects, between 18 and 65 years old, with variable BMI were recruited. Subjects consumed a low oxalate controlled diet containing 16% protein, 30% fat, 54% carbohydrate, 1000 mg calcium, and 30 mg oxalate which was devoid of vitamin C and calcium supplements. Subjects remained on this diet for 3 days. 24-hour urine collections were performed on the last two days. Urinary oxalate was measured by ion chromatography coupled with mass spectroscopy. Statistical analysis included Chi-squared, correlation and linear regression analysis, and student t-test.

Results

There were 41 subjects recruited with various BMIs (19-42). Urinary oxalate excretion (mg/day) was positively correlated with BMI (r=0.44, p=0.004) and waist circumference (r=0.42, p=0.006). Similar correlations were see with urinary glycolate excretion (mg/day) with BMI (r=0.41, p=0.007) and waist circumference (r=0.36, p=0.02). Urinary oxalate and glycolate excretion was positively correlated (r=0.31, p=0.049).

Discussion

These results demonstrate a positive correlation between urinary oxalate derived from endogenous oxalate synthesis and BMI as well as other measures of obesity. This also provides an explanation for the association between stone risk and obesity.



Funding: AUA Research Scholar, Endourology Society, Friends of Joe, NORC Intramural Grant, K08 NIH, P20 NIH

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

MP22-04 – IMPACT OF DEMOGRAPHIC FACTORS AND SYSTEMIC DISEASE ON URINARY STONE RISK PARAMETERS AMONGST STONE FORMERS

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Introduction

Age, sex, and race are all known to influence kidney stone risk. Previous literature has demonstrated a clear link between kidney stone disease, obesity, and diabetes. Our objective was to examine in a multivariate analysis the associations between various demographic factors and systemic diseases on stone risk parameters in a stone forming population.

Methods

A retrospective chart review of adult kidney stone patients who completed 24-hour urine collections from April 2004 through August 2015 was performed. Demographic information was captured including age at collection, sex, race, and BMI. Chart review was performed to assess for a diagnosis of diabetes and hypertension. The results of CT Imaging, and renal/abdominal ultrasonography, performed with ±6 months were reviewed for a diagnosis of fatty liver disease. Statistical analysis included Pearson correlation analysis, Spearman correlation analysis, and linear and logistic regression analyses, both univariate and multivariate.

Results

There were 589 patients included in the study. Numerous urinary parameters were significant in association with demographic factors or systemic diseases in a multivariate analysis. Older age was associated with decreased calcium (Ca) excretion (p=0.0214), decreased supersaturation of calcium oxalate (SSCaOx) (p=0.0262), decreased supersaturation of calcium phosphate (SSCaP) (p< .0001), and decreased urinary pH (p=0.0201). Males excreted more Ca (p=0.0015) and oxalate (Ox) (p=0.0010), had lower urine pH (p=0.0269), and higher supersaturation of uric acid (SSUA) (p< .0001) than women. For race, African Americans had lower urine volume (p=0.0023), less Ca excretion (p=0.0142), less Ox excretion (p=0.0074), and higher SSUA (p=0.0049). Diabetes was associated with more Ox excretion (p< .0001), lower SSCaP (p=0.0068), and lower urinary pH (p=0.0153). There were positive correlations between BMI and Ca excretion (p=0.0386), BMI and Ox excretion (p=0.0177), and BMI and SSUA (p=0.0045).

Discussion

These results demonstrate that both demographic factors and systemic disease are independently associated with numerous risk factors for kidney stones. These results highlight that there are differential risks for individuals to develop kidney stones based on these associations. The mechanisms responsible for these associations and disparities (racial differences) need to be further elucidated.

Funding: AUA Research Scholar, Endourology Society, Friends of Joe, NORC Intramural Grant, K08 NIH, P20 NIH

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MP22-07 SCREENING FOR PRIMARY HYPERPARATHYROIDISM IN A TERTIARY STONE CLINIC, A USEFUL ENDEAVOR

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Introduction

Primary Hyperparathyroidism (1HPT) is associated with the risk of developing kidney stones. In addition, stone formers (SF) may have secondary hyperparathyroidism due to vitamin D deficiency or gastrointestinal malabsorption of calcium. Our objective was to determine the prevalence of 1HPT amongst SF evaluated at a tertiary stone clinic and determine if it is cost effective to screen for this condition.

Methods

We retrospectively reviewed 742 adult SF seen by a single urologic surgeon from 2012-2017 all of who were screened for 1HPT with an intact serum PTH (iPTH) and calcium. The diagnosis of 1HPT was based on the presence of hypercalcemia with an inappropriately elevated iPTH or a high normal serum calcium and an elevated iPTH. The diagnosis was confirmed by surgical neck exploration. Published cost data and stone recurrence rates were utilized to create a cost-effectiveness decision tree.

Results

Fifty-three (7.1%) were diagnosed with 1HPT. Fifteen (28%) had hypercalcemia and inappropriately elevated iPTH, 38 (72%) had high normal serum calcium levels and inappropriately elevated iPTH. The potential diagnosis was ignored/missed by primary care physicians in 9 (17.0%) based on review of prior lab results. Cost modeling was undertaken for 5, 10, 15, and 20 year intervals after screening. Based on our prevalence data, historical risks for recurrence and published cost data for stone treatments, cost savings in screening are realized at 10 years.

Discussion

These results support screening for primary hyperparathyroidism in patients evaluated in a tertiary referral setting.

Assumed Prevalence of 1HPT	5 years	10 years	15 years	20 years
1.00%	0.91	0.96	0.97	0.98
2.00%	0.92	0.97	0.98	0.99
3.00%	0.93	0.98	0.99	1.00
4.00%	0.94	0.99	1.00	1.01
5.00%	0.95	1.00	1.02	1.02
6.00%	0.97	1.02	1.04	1.05
7.10%	0.98	1.03	1.05	1.07

Funding: AUA Research Scholar, Endourology Society, Friends of Joe, NORC Intramural Grant, K08 NIH

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