Prospective Evaluation of Urinary Metabolic Indices in Severely Obese Adolescents after Weight Loss Surgery

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BACKGROUND: Observational studies in obese adults have found abnormal urinary metabolic indices that predispose to nephrolithiasis. Few studies have been performed in severely obese adolescents.

OBJECTIVES: To assess urinary stone risk factors in severely obese adolescents and in those undergoing 2 types of weight loss surgery.

SETTING: Children’s hospital, United States.

METHODS: A prospective cross-sectional study was performed to assess urinary metabolic profiles in severely obese adolescents who either have not undergone any gastrointestinal surgery or who have undergone Roux-en-Y gastric bypass (RYGB) or vertical sleeve gastrectomy (SG). Twenty-four-hour urine collections were performed at home and evaluated at a central laboratory. Established normal reference ranges for adults were used in the analysis. A linear regression analysis was performed assessing the relationship of the study group with each of the outcomes.

RESULTS: A total of 55 samples were analyzed from 14 severely obese adolescents and from 17 severely obese adolescents after bariatric surgery (RYGB, 10; SG, 7). Median body mass index was similar between the RYGB and SG groups. The median 24-hour excretion of oxalate was significantly elevated in the RYGB group. Calcium and uric acid excretion and the median supersaturation of calcium oxalate, calcium phosphate, and uric acid were similar among all groups.

CONCLUSIONS: Elevated excretion of oxalate in the urine of severely obese adolescents and in those who have undergone RYGB may portend increased risk for kidney stone formation. Larger longitudinal studies are needed to verify these findings and to determine the clinical risk of developing stone disease in these patient populations.