Value of the Spot Urine Sample for the Metabolic Evaluation of Urolithiasis Patients

Introduction and Objectives: To compare between spot urine sample and 24-hours urine collection for the metabolic evaluation of urolithiasis patients and to study the variability of different urinary risk factors between the stone-formers and non-stone formers.
Materials and Methods: Two groups, 58 adult persons each were included in this study. Stone-formers (group 1) and non-stone formers group (group 2). Each one in both groups was subjected to clinical evaluation, laboratory investigations and radiological evaluation. For all, morning spot urine specimen and 24-hour urine collection was obtained at the outpatient clinic. Urinary risk factors (pH, creatinine, citrate, oxalate, calcium, uric acid and magnesium) were tested in 24-hour and spot urine in both groups.
Results: In group 1 43 (74.1%) males and 15 (25.9%) females were involved with the mean age of (42.52±10.699) years. While in group 2, 47 (81%) males and 11 (19%) females were involved with the mean age of (26.79±5.881) years. There was a significant difference between the body mass index (BMI) of the stone formers (29.976±8.56) kg/m2 and the non-stone formers (27.159±4.453) kg/m2 ($p<0.01$). The mean urine volume of non-stone formers (2462±352.349) ml/day was significantly higher than that of stone-formers (1575.86±645.174) ml/day ($p <0.01$). The pH of stone-formers was (5.77±0.67) and (5.75±0.6) in the 24-hour and spot-urine samples, respectively ($p <0.01$), while the pH of non-stone formers was (6.345±0.51) and (6.29±0.45) in the 24-hour and spot urine samples, respectively ($p<0.01$). In the stone-formers group, the mean excretion/day of calcium, oxalate, citrate, magnesium, was significantly higher in comparison to non-stone formers in both 24-hours urine and spot urine samples. There was normal urate excretion in both groups ($p <0.01$). The mean calcium excretion/day in the stone-formers (331.75±142.06) mg/day was significantly higher than that of non-stone formers (231.58±79.21) mg/day. The mean excretions of magnesium and citrate/day in the non-stone formers (127.89±24.84 and 2209.86±363.22) mg /day, were significantly higher than that of the stone-formers (40.02±23.11 and 502.27±300.44) mg/day for magnesium and citrate respectively. Consecutive observations and correlation of creatinine-corrected uric acid, calcium, magnesium, citrate and oxalate showed similar pattern between spot and 24-hours urine in the two study groups.
Conclusions: Morning spot urine analysis adequately correlates the conventional 24-hours urine collection for metabolic evaluation of urolithiasis patients.