

Urinary chemokines/cytokines in patients with calcium oxalate urolithiasis

Hypothesis / aims of study

Urolithiasis is widespread and can be asymptomatic for a long time and have a high recurrence rate. Calcium oxalate stones are the most common. We hypothesized that inflammation underlies the formation of calcium oxalate stones, since urinary chemokines/cytokines are elevated in patients with urolithiasis that urinary stones are associated with a cascade of inflammatory responses.

The aim of the study was to investigate urinary inflammatory cytokine and chemokine profiles in patients with calcium oxalate urolithiasis as prognostic markers of urolithiasis.

Study design, materials and methods

The study included 50 patients with urolithiasis and 30 healthy volunteers. The composition of kidney stones was analyzed by infrared spectrometry. Urine samples were collected in the absence of any symptoms of urolithiasis. Interleukin-8 (IL-8), regulated on activation, normal T cell expressed and secreted (RANTES), monocyte chemoattractant protein-1 (MCP-1), tumor necrosis factor-alpha (TNF-a), calprotectin levels were measured in urine samples using enzyme-linked immunosorbent assay.

Results

After adjustment for urinary creatinine, IL-8, MCP-1, TNF-a, RANTES, calprotectin urine levels were evaluated. IL-8, RANTES, calprotectin were significantly elevated in the presence of kidney stones compared with healthy controls. Urinary MCP-1, TNF-a concentrations were not significantly different between patients and healthy controls. This is a very important point that calprotectin was increased in all patients with urolithiasis in 100%, while RANTES and IL-8 in 65% and 78 %, respectively.

Interpretation of results

Our data showed that calcium oxalate stones are associated with a cascade of aseptic inflammatory reactions involving calprotectin. This supports the finding that the urinary stone matrix contains calprotectin. Thus, calprotectin is a biomarker associated with calcium oxalate stones.

Concluding message

The elevated urinary calprotectin level can be considered as a biomarker of calcium oxalate urolithiasis, including for screening and monitoring of recurrence as a risk factor.

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