Classification of Urolithiasis in Denmark—a national survey

Andreasen KH, Poulsen AL, Rosenkilde Olsen P, Aabech H, Osther PJ on behalf of the “DANSTEN-2002” project group.  
Departments of Urology: Frederiksborg Hospital, Holbæk Hospital, and Fredericia Hospital. Correspondence: kim.andreasen@frh.regionh.dk

EULIS 2007. Handout oral presentation no. 126

Background: 
To describe the distribution of stone diseases in Denmark, using a simple classification system based on etiology and risk factors.

Design, methods and material: 
All urological departments in Denmark were invited to join a central registration of all adult patients with upper urinary tract stones for a 2-year period. Seventeen departments participated (90%). Patients were evaluated according to the guidelines from the Scandinavian Cooperative Group for Urinary Stones (1).

Both hospitalized and out-patients were included. Patients could only be registered once. Patients were evaluated and classified according to the guidelines (fig. 1 and table 1-2).

MIAF urolithiasis: conditions with a definitive Metabolic, Infectious, Anatomical or Functional cause of stone formation. Seventeen departments representing 11 of 14 counties participated, covering approximately 90 % of the population.

Number of patients/department: median 81 (range: 19 - 429).

Overall results (number of patients and distribution) (N=2294):

Classification: 
Simple idiopathic calcium urolithiasis
Complicated idiopathic calcium urolithiasis: With hypercalciuria With hypocitraturia With both hypercalciuria and hypocitraturia With neither hypercalciuria nor hypocitraturia With unknown urine calcium and urine citrate
MIAF urolithiasis: 
Metabolic: Urine related disorders Urine stone with hyperuricaemia Urine stone without hyperuricaemia 2,8 dihydroxyadenuria Xanthinuria Hypocalciuric states: Primary hyperparathyroidism Everlitic hyperoxaluria Hypercalciemic states: Primary hypercalciuria Other hypercalciemic conditions Renal tubular acidosis Chronic renal failure states Cystinuria Other rare causes not mentioned above (ex. Indinavir)
Infection stones Anatomical or Functional abnormalities Classification not possible (incomplete diagnostics)

Evaluation chart

Medical history & imaging: 
Stone analysis: Complicated urolithiasis: 
Complicated idiopathic calcium urolithiasis: With hypercalciuria With hypocitraturia With both hypercalciuria and hypocitraturia With neither hypercalciuria nor hypocitraturia With unknown urine calcium and urine citrate

Overall results (number of patients and distribution) (N=2294):

Classification

Simple idiopathic calcium urolithiasis 1190 52.9
Complicated idiopathic calcium urolithiasis 534 23.2
MIAF urolithiasis
Metabolic: Urine related disorders Urine stone with hyperuricaemia Urine stone without hyperuricaemia 2,8 dihydroxyadenuria Xanthinuria Hypocalciuric states: Primary hyperparathyroidism Everlitic hyperoxaluria Hypercalciemic states: Primary hypercalciuria Other hypercalciemic conditions Renal tubular acidosis Chronic renal failure states Cystinuria Other rare causes not mentioned above (ex. Indinavir)
Infection stones Anatomical or Functional abnormalities Classification not possible (incomplete diagnostics)

Results: 
2294 patients were registered.

Classification (N=2294): 
Hypercalciuria and/or hypocitraturia in patients with complicated idiopathic calcium urolithiasis

Hypercalciuria in children (10-15y): 32.5 %
Hypocitraturia in children (10-15y): 42.6 %

Definition of simple and complicated stone disease
Simple stone disease: Single stone formers with spontaneous passage of stone.
Complicated stone disease: 
- Urological history or evaluation: Complex stone formations, multiple stone events, stone-related complications, stone disease requiring surgical intervention.
- Imaging, stone analysis or medical history: Chronic renal failure, hyperparathyroidism, renal tubular acidosis, enteric hyperoxaluria, or chronic diarrhoea.

389 patients (17 %) had MIAF-urolithiasis, 1724 patients (75 %) had idiopathic calcium urolithiasis, and 181 patients (8 %) were not classified (fig. 2).

1190 patients (52 %) had simple idiopathic calcium urolithiasis, 534 patients (23 %) had complicated idiopathic calcium urolithiasis, 214 patients (9 %) had a metabolic cause, 63 patients (3 %) had infection stones, and 112 patients (5 %) had an anatomical/functional cause (fig 3).

Among 534 patients with complicated idiopathic calcium urolithiasis 48 (9 %) had hypercalciuria, 155 (29 %) had hypocitraturia, 19 (4 %) both hypercalciuria and hypocitraturia and 117 (22 %) had neither hypercalciuria nor hypocitraturia. In 195 patients (38 %) 24H U-calium and U-citrate was not available. (fig. 4).

214 patients had a metabolic cause (specified in fig. 5). The were no cases of 2,8 dihydroxyadenuria or xanthinuria.

Conclusion
The classification system was applicable and of clinical value. The results are supposed to be representative for the whole nation of Denmark.