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### Stones and Endourology

Original article

# Epidemiological characteristics of childhood urolithiasis in Morocco



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#### KEYWORDS

Urolithiasis;  
Children;  
Epidemiology;  
Prevalence;  
Fez;  
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#### Abstract

**Objectives:** Due to the increase observed in the incidence of pediatric urolithiasis in the world, and the scarcity of studies of this pathology in Morocco, we assessed whether epidemiological characteristics of pediatric urolithiasis have a similar profile like in developed countries further we tried to assess the prevalence of this pathology among children in Hassan II University-Hospital of Fez.

**Subjects and methods:** Between January 2003 to November 2013, 104 pediatric patients with urolithiasis were presented to Hassan II University-Hospital of Fez. Eighty one were boys and 23 girls. Patients were referred from different regions of Moroccan states.

**Results:** Out of 104 children diagnosed with urolithiasis, 5 patients with positive family history of renal stones, and 12 were recurrent (12%).

Their age varied between 8 months and 15 years old, with a mean age of  $7.86 \pm 4$ . The sex ratio was 3.5:1 boys to girls. Clinical presentations were dominated by micturition disorder (59%), abdominal or flank pain (28%), nephritic colic (22%), hematuria (22%) and urinary tract infection (13%). Stones were located in the upper urinary tract in 62.5% of cases.

Stones were treated by surgery in 89 cases (89%), and with ESWL in only 2 cases (2%).

Over these years of study, a prevalence of 0.83% of childhood urolithiasis was calculated.

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**Conclusions:** This preliminary study represents only a region of the country, so more epidemiological analyses should be done.

Stone analysis should be performed more frequently, and patients must be presented at earlier stages, before any development of renal failure.

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## Introduction

Urinary stone disease affects patients of all ages but remains rare in children [1]. The composition and clinical characteristics of urinary calculi in children varies greatly from one country to another and from one historic period to the next, depending on several factors such as dietary, climate, genetic and socio-economic factors [2,3].

In Morocco, stone prevalence, incidence and risk factors for hospitalization occur less in children compared to adults.

The aim of this study was to identify trends in the epidemiology of urolithiasis during an 11-year period among children at Pediatric and Pediatric surgery departments of Hassan II University-Hospital of Fez.

## Subjects and methods

From January 2003 to November 2013, 104 pediatric patients with urolithiasis were treated in Hassan II University-Hospitals of Fez. Patients were referred from different regions of Moroccan state. Medical records were evaluated for clinical and laboratory data including age of diagnosis, sex, personal, family history, clinical presentations, location of stones and method of treatments.

Statistical analysis were performed with SPSS software version 21, with a significance value set at  $P < 0.05$ .

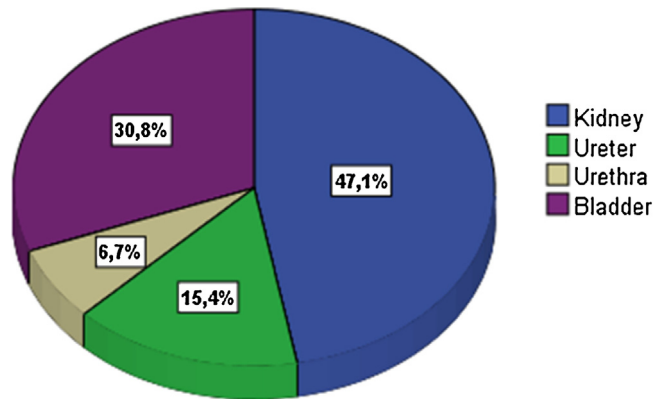
## Results

The age of pediatric urolithiasis patients at diagnosis ranged from 8 months to 15 years old with an average of  $7.86 \pm 4$  years (Mean  $\pm$  SD). 81 were boys and 23 girls, while the sex ratio was 3.5:1 boys to girls.

Over these 11 years, a prevalence of 0.83% of childhood urolithiasis was calculated.

Out of the 104 children diagnosed with urolithiasis disease, 68% of patients come from rural areas, 5 of those children have a positive family history of urolithiasis, and 12 cases were recurrent (12%).

Clinical presentations of this pathology were variable and multiple in some cases. They were dominated by micturition disorder (59%), abdominal or flank pain (28%) and nephritic colic 22%. Hematuria and urinary tract infection as clinical presentations of stone formation were found respectively in 22% and 13% of our patients. Anatomical abnormalities were detected in 4 patients, and only in one of these patients, urolithiasis was detected incidentally.



**Fig. 1** Location stones in urinary track.

Stones were located in the upper urinary tract among 62.5% of cases (kidney: 47.1%, ureter: 15.4%), and were mostly found in children over 5 years old, and in the lower tract in 37.5% cases (bladder: 30.8%; urethra: 6.7%) (Fig. 1).

Ultrasound examinations revealed that unilateral stones occur in 87.5% of patients (42.9 right; 44.6 left) and bilateral ones in 12.5% of all cases.

The stone sizes were also determined by echography and scanner varied between 4 and 40 mm (Fig. 2).

At the time of diagnosis, 19 patients (18.3%) had positive urine cultures; *E. coli* was the most commonly encountered microorganism. It represents 47.4% of species. *P. mirabilis*, *P. aeruginosa* and Enterobacter genus represented 10.5%.

Stones were analyzed only in 16 patients (15.4%), 62.5% of cases by chemical methods and 37.5% of cases by infrared spectrophotometry.

Calcium oxalate stones were present in 56.25% of cases, phosphate in 50% of stones in which struvite represented 18.75% of cases. Uric acid was present in 12.5% of stones.

Our data revealed that (6.7%) cases of chronic renal failures are the result of urinary stone disease.

Because of the absence of other less invasive techniques in Hassan II hospital, surgery is considered to be the only technique of extracting urinary calculi from children. It represents 89 cases, and 2 cases of ESWL in our series were performed in the pediatric hospital of Rabat. The stones passed spontaneously in 4.4% of cases.

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