

Pattern of Presentation and Management of Urolithiasis at Federal Medical Centre, Nguru, Nigeria.

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ABSTRACT

Background: Urolithiasis has been with mankind since ancient time. Although it is more common in the developed world, the pattern of presentation in the developing countries is tending towards that of developed countries.

Objectives: To evaluate the pattern of presentations and treatments offered to patients with urolithiasis over the last 2 years at Federal Medical Centre (FMC), Nguru.

Materials and Methods: The study is a 2-year retrospective review of patients managed for urolithiasis at FMC Nguru. The patients' bio-data, pattern of presentation and radiological features of the stones, as well as the treatment given to the patients, were reviewed.

Results: The records of 55 patients were reviewed; the mean age was 24.1 years with a range of 1.5 to 70 years. The male to female ratio was 10:1. The most common presenting symptom was painful micturition in 21 patients (38.18%). The total number of stones extracted was 58, one patient had multiple right renal pelvic calculi, another had bilateral renal pelvic stone and the third patient had bladder and distal ureteric stone. Two patients (3.64%) expelled their calculi while awaiting surgery, the remaining 53 patients (96.36%) had opened surgical treatment. Most of the stones are in the bladder in 29 patients (52%). Twenty-one patients (38.18%) had upper urinary tract stones out of which 13 were in the renal pelvis.

Conclusion: Urolithiasis is also common in the developing communities. Despite the changing pattern from lower to the upper tract in developed countries, we found lower tract stone dominating as seen in many underdeveloped. This may be attributable to yet to establish environmental or genetic factors.

KEYWORDS: Pattern, Presentation, Urolithiasis, Developing countries

Introduction

Urolithiasis is a leading ubiquitous urologic lesion that is as old as human history. The preceding reviews revealed it's less common

in the developing countries¹⁻⁴. However, contemporary conclusions showed the incidence is on the rise especially in the urban areas of the developing communities⁵⁻⁷. Some studies likewise show changing pattern of presentation in these developing countries from mainly lower urinary tract stones that affect bladder and urethra towards that of the western countries that are mainly upper urinary tract stones affecting the kidneys and ureters⁸. The aim of our study is to evaluate the pattern of presentation plus the treatment offered to the patients with urolithiasis over 2 year period at a tertiary health institution; the Federal Medical Centre (FMC), Nguru, Nigeria.

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Materials and Methods

This appraisal was a 2-year retrospective review of patients that were managed for urolithiasis at the Federal Medical Centre Nguru. Ethical clearance was obtained in the first place from hospital ethics committee.

The hospital records of the patients that had treatment for urinary calculi between September 2013 and August 2015 were retrieved from the surgical out-patient unit, accident and emergency, theatre, and surgical wards.

The Information extracted included the patients' bio-data, clinical presentation, laboratory and radiological findings, plus the treatment rendered. The data are analysed by using SPSS version 21.

Results

Eighty-four patients were diagnosed with urolithiasis during the period. Fifty-five case notes were retrieved; the remaining were misplaced and excluded from analysis.

The mean age of the patients was 24.1 (± 19.56) years; age range was 1.5 to 70 years and peak age group 1 to 10 years (Table 1.). A total of 36.36% of the patients were children (age less than 12 years). The male to female ratio was 10:1. The most common presenting symptom was painful micturition indicated in 21 patients (38.2%) as shown in Table 2. Associated presentations included pyuria, haematuria, hypertension and vomiting as depicted in Table 3. Ten patients (18.18%) had urinary obstruction as shown in Table 4.

An abdomino-pelvic ultrasound scan was effected in forty-seven patients out of whom forty-one (87.23%) revealed calculi. Of the 46 patients that had plain abdominal X-ray, 44 patients (95.65%) had radio-opaque calculi and 2 (4.35%) radiolucent calculi were discovered intra-operatively. Intravenous urogram carried out in 19 patients, all

demonstrated pelvic-calyceal system dilatation. Limited metabolic evaluation in the form of serum calcium, serum uric acid and inorganic phosphate assay done in seventeen patients revealed hyperuricaemia in 3 patients.

Urine microscopy and culture in the 55 patients yielded mainly *E. coli* in 13 patients (23.64%) as shown in Figure 1.

Fifty-three (96.36%) patients had open surgeries; whilst two expelled their ureteric calculi while on conservative treatment. At surgery 50 patients had solitary calculi and 3 multiple (one patient had multiple right renal pelvic calculi, another had bilateral renal pelvic stone and the third patient had bladder and distal ureteric stone). The total number of stones extracted were fifty-eight.

Based on the location of the calculi along the urinary tract, 21 patients (38.2%) had upper urinary tract stones (13 in the renal pelvis and 8 in the ureters). Right-sided upper tract calculi were 12 (66.66%) patients. Lower urinary tract stones were in 33 patients (60%), mostly in the bladder (52%). One patient has both upper and lower tract stone as shown in Table 5.

Stone sizes recorded in forty-two patients showed the mean size of 3.68cm (± 1.9), the smallest recorded calculus was 0.5cm in diameter and the largest was 6cm.

Post-operative complications were encountered in seven patients (12.73%); six surgical site infection and a residual right renal stone about 0.5cm in a patient.



Pattern of Presentation and Management of Urolithiasis

TABLE 1: Age distribution in years

Age range (Yr)	Sex		Frequency	Percentage
	M	F		
1 - 10	16	2	18	32.7
11 - 20	9	0	9	16.4
21 - 30	10	1	11	20.0
31 - 40	4	1	5	9.1
41 - 50	5	0	5	9.1
51 - 60	3	0	3	5.4
61 - 70	3	1	4	7.3
Total	50	5	55	100

TABLE 2: Presenting complaints

Symptom	Frequency	Percentage
Dysuria	21	38.2
Loin pain	20	36.4
Suprapubic pain	5	9.1
Acute Urinary Retention	4	7.3
No pain	5	9.1
Total	55	100.0



TABLE 3: Other findings

Other symptoms	Frequency
Pyuria	15
Haematuria	7
Hypertension	4
Vomiting	3
Passage of stone in the urine	2
Symptoms of Anaemia	1
Renal failure	1

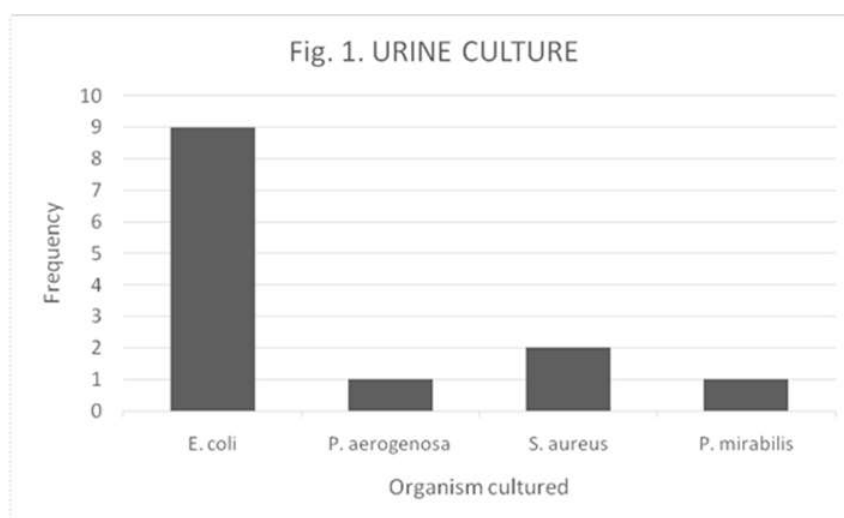
TABLE 4: Background urinary obstruction

Condition	Frequency	Percentage
BPH	3	5.5
Bladder neck stenosis	2	3.6
PUJ obstruction	2	3.6
Urethral stricture	1	1.8
Distal ureteric stricture	2	3.6
Total	10	18.1

TABLE 5: Stone location

Location of stone	Frequency	Percentage(%)
Renal pelvic	13	23.6
Ureter	8	14.5
Ureter & bladder	1	1.8
Bladder	29	52.7
Urethral	4	7.3
Total	55	100.0





Discussion

Urolithiasis is a leading ubiquitous urologic presentation. Its incidence is steadily on the rise in the developing countries^{6,9,10}. This plausibly ascribes to westernisation in the lifestyle and diet. The modal age group in our appraisal was 1 to 10 years and the mean age at presentation was 24.1 years. This was low when matched with some studies^{1,4}, the rationale may be higher prevalence of paediatric urolithiasis in our appraisal with children constituting 36.36% of the entire patients with calculi. This was also much higher than reported by Schwarz et al¹¹. He concluded that paediatrics represent 2-3% of the whole population of stone-formers. The increasing incidence of paediatric urolithiasis appear to be global over the last decade¹². In a study by Van Dervoort et al. in the USA, up to five-fold increase in the prevalence of urinary stone in children was realized in the last decade^{13,14}. Even though urolithiasis in paediatric is more often than not associated with background metabolic or obstructive abnormalities in the urinary tract¹⁵⁻¹⁷, our study however, did not identify such abnormalities. There are no sufficient facilities for comprehensive metabolic evaluation in most developing countries including ours and only 17 seventeen patients

(30.91%) in our review had the available limited evaluation. However, there are growing conclusions linking urolithiasis in paediatrics age group with low socioeconomic status¹⁸ and malnutrition^{19,21}.

The male to female ratio in this appraisal was higher than reported in a number of studies²²⁻²⁴. Greater incidence of calculi in males has been credited to higher protein meal that elevates urinary excretion of phosphates and magnesium and reduces urinary citrate concentration²⁵. The lower incidence in women was until recently ascribed to increased urinary citrate concentrations which lower urinary saturation of stone-forming salts²⁶; recent review indicted endogenous estrogen. It was also assumed that estrogen therapy in postmenopausal women may reduce the risk of calculi recurrence by decreasing urinary calcium and calcium oxalate saturation. The most common presenting complaint in this study was painful micturition this may be due to the high prevalence of bladder stone. Some studies reported loin pain as the commonest presentation parallel higher upper tract calculi^{23,27}. Other associated features included pyuria and haematuria not uncommon in patients with urolithiasis. Even though all

patients had urine microscopy culture and sensitivity test, only thirteen patients (23.6%) had positive growth of mainly *E. coli*. This was identical to findings by Petkovic et al and Yilmaz et al^{28,29}.

The global trend showed increased in the prevalence of upper tract stone^{30,31}, in this study per contra lower tract stone mainly bladder stone had higher prevalence similar to many developing countries^{9,32,33} as shown in Table 5.

Advances in technology and surgical innovations has made open surgery uncommon procedure in the treatment of urolithiasis in many countries³⁴, but it remains the mainstay of treatment in low-resource centres like ours³⁵. All the patients except two had open surgeries. This is due to non-availability of the minimally invasive options. In developing countries, the paucity of urological facilities and expertise necessitate open surgical procedures^{22,36}.

Unlike other endemic countries where bladder stones extracted are typically large³⁷⁻³⁹, the average size of stone extracted in our

study was 3.68cm.

Postoperative complications were recorded in seven patients (12.73%); six surgical site infections and a residual right renal stone of 0.5cm in a patient.

Limitation of our review included inherent weaknesses of retrospective studies; the missing case notes and information as a result of inadequacy of record keeping. A long-term prospective appraisal may address some of the shortcomings.

Conclusion

Urolithiasis is a leading ubiquitous urologic ailment. Contrary to the changing pattern of lower to the upper tract calculi in developed countries, our appraisal revealed lower tract calculi dominance that rhymes with conclusions from many underdeveloped communities. Urinary calculi treatment should, therefore, occupy its rightful place in health care planning and capacity building prioritisation. A shift towards endourological interventions as obtained in developed societies is highly desirable in our setting.

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