

RENAL STONES IN KELANTAN, MALAYSIA - HAS THE PATTERN CHANGED?

N Nazmi¹, D Zainal¹ and M Hashim²

¹Department of Medicine, Hospital Universiti Sains Malaysia, Kubang Kerian, 16150 Kota Bharu, Kelantan, Malaysia; ²Department of Surgery, Universiti Sains Malaysia Hospital, Kubang Kerian, 16150 Kota Bharu, Kelantan, Malaysia

Abstract. Records of 183 patients with renal stones managed at Hospital Universiti Sains Malaysia between 1985 and 1995 were retrospectively evaluated.

The commonest symptom was lumbar pain which may be associated with either frequency, blood stained urine or dysuria. One hundred and sixty-one patients (88%) had upper tract stones while the remainder had lower tract stones. Positive urine cultures were seen in 33 patients. The commonest organism isolated was *Escherichia coli* followed by *Klebsiella aeruginosa* and *Staphylococcus aureus*.

Almost all of our patients had renal impairment at presentation and 70% of them progressed to chronic renal failure.

In contrast to previous findings, the pattern of renal stone in this region is similar to that described in Western society. Its effect on renal function is serious and hence warrant special attention.

INTRODUCTION

Urinary stone is a common problem encountered in clinical practice in Kelantan, the Northern Eastern state of Malaysia. The patterns of renal stone described by earlier studies in this region were rather confusing. In an earlier study (Sreenivasan, 1981) it was shown that upper tract stones was more common than lower tract stones. In addition there was a decreasing trend in the incidence of lower tract stones in this state. On the other hand a subsequent study (Lim *et al*, 1988) revealed that lower tract stones were more prevalent than upper tract stones.

Hence, to clarify this issue we decided to conduct a retrospective study to assess the clinical pattern of renal stone diseases in this region.

MATERIALS AND METHODS

Records of patients with the diagnosis of renal stones treated at Hospital Universiti Sains Malaysia (HUSM) between 1985-1995 were traced and re-

viewed. Clinical details such as biodata, presenting symptoms, laboratory results and treatment given were noted.

The effects of renal stone diseases on kidney function were based on the latest available serum creatinine levels. A Cockcroft and Gault formula was used to calculate the creatinine clearance (CrCl):

$$\text{CrCl} = \frac{(140 - \text{age}) \times (\text{body weight in kg}) \times C}{72 \times \text{plasma creatinine in mg \%}}$$

The severity of renal impairment was defined as follows:

mild = CrCl between 50 - 30 ml/min/1.73 m²

moderate = CrCl between 30 - 20 ml/min/1.73 m²

severe = CrCl between 20 - 10 ml/min/1.73 m²

End-stage = CrCl less than 10 ml/min/1.73 m²

Where C in females = 0.85 and in males = 1

RESULTS

A total of 183 patients with a diagnosis of renal stones were treated at Hospital Universiti Sains Malaysia (HUSM) between 1985 and 1995. During this study period a total of 200,204 patients were admitted to HUSM. Hence the prevalence of renal stone disease was 9.8 per 100,000 patients per year.

Correspondence: D Zainal, Department of Medicine, Hospital Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia.

Age, sex and ethnic group

The majority of patients were between the age of 50 and 59 years, as illustrated in Fig 1. There were 123 males and 60 females, a 2 : 1 ratio. 172 were Malays, 9 were Chinese, 1 Indian and 1 categorized as "others" was from Thailand.

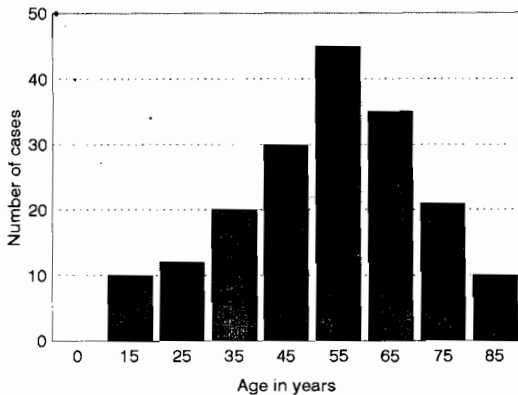


Fig 1—Distribution of age among renal stone patients.

Clinical presentation

Lumbar pain was the commonest complaint. This may be associated with either frequency, dysuria and blood stained urine. The character of pain varies from patient to patient which were described as either burning, stabbing, or sharp radiating to the loin. Other complaints were back pain,

abdominal pain and suprapubic pain as illustrated in Table 1. Thirty-nine patients had a history of either passing sandy materials in their urine or stones per urethra. The majority of them could not recall how many stones they passed.

Site or distribution of stone

Majority of our patients (161) had their stones in the kidneys. Out of this 20 patients had staghorn calculi (Table 2).

Urine cultures

Eighteen percent of our patients had concomitant urinary tract infections at presentation. The commonest causative organism was *Escherichia coli* (Table 3), while *Klebsiella*, *Proteus* and *Pseudomonas* were seen in 33.3% of patients with urinary tract infections.

Serum biochemistry

The serum biochemistry results of patients with renal stone are shown in Table 4. Almost all of our patients (90%) had renal impairment of varying degree at presentation. During the course of the disease process approximately 70% of them progressed into chronic renal impairment (Table 5), of which 3.8% required permanent renal replacement therapy.

Table 1
Clinical presentations of patients with renal calculi.

Symptoms	n (%)
Back pain + passing sandy materials	4 (2.2)
Abdominal pain + passed out stone per urethra	9 (5.0)
Lumbar pain only	55 (30.0)
Lumbar pain + hematuria	19 (10.4)
Lumbar pain + hematuria + dysuria	3 (1.6)
Lumbar pain + hematuria + passed out stone	4 (2.2)
Suprapubic pain + passed out stone	1 (0.5)
Hematuria + passed out stone	8 (4.4)
Dysuria + passed out stone	1 (0.5)
Passed out stone per urethra	12 (6.6)
Asymptomatic	67 (36.6)

Table 2
Anatomical distribution of calculi.

General	Specific site	Unilateral	Bilateral	Total
Upper tract	Kidney (s)	104	47	151
	Kidney (s) + ureter	6	4	10
Lower tract	Lower 1/3 ureter	15	3	18
	Bladder	4	-	4
Total				183

Table 3
Organism detected in the urine.

Organism	No. of cases n = 33
<i>Escherichia coli</i>	18
<i>Klebsiella aeruginosa</i>	5
<i>Staphylococcus aureus</i>	3
<i>Pseudomonas aeruginosa</i>	3
<i>Proteus mirabilis</i>	2
<i>Proteus morgani</i>	1
<i>Streptococcus</i> sp	1

Table 4
Serum biochemistry results at initial presentation.

Variables	Mean \pm 1SD	Units
Urea	20.9 \pm 9.0	mmol/l
Sodium	136.5 \pm 5.1	mmol/l
Potassium	4.5 \pm 1.5	mmol/l
Creatinine	188.8 \pm 228.4	μ mol/l
Uric acid	393.7 \pm 184.5	μ mol/l
Total calcium	2.19 \pm 0.3	mmol/l
Phosphate	1.19 \pm 0.6	mmol/l

Management

Almost half of our patients were managed conservatively with liberal fluid intake. The remainder required surgical intervention as illustrated in Table 6. The incidence of recurrence could not be determined, as the majority of patients defaulted follow up.

DISCUSSION

The prevalence of renal stone diseases managed at Hospital Universiti Sains Malaysia was 9.8 per 100,000 admissions per year. The male preponderance and the peak of age incidence in the fifth decade are in accord with findings reported elsewhere (Robertson *et al*, 1980; Schneider, 1985).

In a previous study of the extent and distribution of calculus disease in Peninsula Malaysia, Sree-

nevason (1981) used five yearly hospital returns to examine the admission rates. He found an incidence of 33.3 per 100,000 admissions for upper tract calculi and 3.6 per 100,000 for lower tract calculi in Kelantan between 1972 and 1976.

Subsequently, between 1984 and 1986 Lim *et al* (1988) analyzed operative cases of renal calculi in Kelantan. They found lower tract stones were more common than upper tract stones.

In this study we found that renal calculi in this region are predominantly of upper tract origin which is similar to the pattern, described in industrialized countries (Avioli, 1978). This study has pointed out that it is important to define the study population. If we look into admission rates, we are bound to find higher prevalence of upper tract calculi whereas if we look into operative cases we are bound to see more lower tract calculi. This is because the admission/operation ratio was higher for patients with upper tract stones compared to

Table 5

Severity of renal impairment based on the latest calculated creatinine clearance.

Degree of renal impairment	No. of patients n = 183	(%)
Normal	52	(29.5)
Mild	79	(43.2)
Moderate	30	(16.4)
Severe	13	(7.1)
End-stage renal failure	7	(3.8)

Table 6

Operations conducted.

Type of operations	No. of cases n = 76
Pyelolithotomy	39
Ureterolithotomy	19
Vesicolithotomy	8
Nephrectomy	2
ESWL	8

those with lower tract stones (Lim *et al*, 1988). Furthermore multiple admissions were more common amongst patients with upper as opposed to lower tract stones.

The other point of interest in this study is the effect of renal stones on renal function tests. This point has not been emphasized in earlier studies. A significant number of our patients has chronic renal impairment during the course of their disease proc-

ess. Many will require renal replacement therapy. This indicates that early detection and prompt treatment is necessary in order to reduce the morbidity imposed by renal stone disease.

In conclusion, these data indicate that the pattern of renal stone is similar to those described in developed countries. Its effect on renal function is serious and hence indicate the need to designed a strategy to reduce the incidence of renal stone in this region.

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