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Clinical study and management of bladder calculus in patients presenting to VMKVMC hospital

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***Abstract*---**Aim: To study and analyse the clinical findings, pattern, various management and their outcome of bladder calculus in patients visiting VMKVMC hospital. Methodology: In this retrospective study about fifty patients with bladder calculus were selected and datas like urine examination, ultrasonogram (USG), X ray KUB were noted. The Management performed in those patients were open suprapubic cystolithotomy or transurethral cystolithotripsy or percutaneous cystolithotripsy. Patients' symptoms, socio- economic status, composition of calculus and post- operative complications were recorded. Results: Out of 50 patients, 30 were male (64%) and 20 were female (36%). Management done was open suprapubic cystolithotomy in 8, transurethral cystolithotripsy in 28 and percutaneous cystolithotripsy in 14 patients. Composition of bladder stones was Caph. CaOx, uric acid in 24, CaOx, uric acid in 3, MAP CaOx uric acid in 16, MAP CaOx in 3, uric acid in 2 and CaOxAmm. Urate in 2 patients. Conclusion: The study revealed that maximum males were affected and transurethral cystolithotripsy was the most common management performed.

***Keywords*---**hematuria, suprapubic pain, transurethral cystolithotripsy, urinary bladder calculus.

Introduction

Urinary bladder calculi account for 5%. It usually migrates from upper urinary tract either primary idiopathic, or secondary calculi.[1] Bladder stones are uncommonly seen in developed countries. It is observed that in adults they are most commonly linked with bladder outlet obstruction, chronic infection or the presence of an intravesical foreign body. History reveals that until the 20th century bladder calculi more prevalent in poor children and adolescent.[2]Nowadays their occurrence in childhood is especially because of malnutrition such as in a protein-poor diet. Urinary stones remain asymptomatic in most of the cases. However, 50% of patients present with symptoms such as suprapubic pain, dysuria, hematuria, weak and choppy urine stream, hesitancy, frequency, urgency and pain in the glans.[3]

Because of increased productivity and movement of nations into industrial age, average income and food quality improvement, these cases started disappearing from previously affected population. Because of improved diet, especially in increased protein carbohydrate ratio, primary vesicle calculi are rare nowadays. In urological practice, new and advanced therapeutic methods are available to manage urolithiasis.[4]

The urinary calculi are formed by 70% of calcium, 20% of uric acid, 10% of magnesium ammonium phosphate (struvite) and about <1% of cystine.[5,6] Urine is a stable solution and any variation in the degree of saturation, of the urinary pH and of the concentration of crystallization inhibitors can alter the existing equilibrium and result in urolithiasis.[7] Considering this, we performed present study to assess clinical findings and management of bladder calculus in patients visiting VMKVMC hospital.

Methodology

After considering the utility of the study and obtaining approval from ethical review committee of the institute, we retrospectively recruited fifty patients presented to department of general surgery OPD and surgical ward of VMKVMC hospital with the complaint of Bladder Calulus. Inclusion criteria were patients with clinical features of bladder calculus with radiological confirmation of calculus disease. Exclusion criteria were patients who were critically ill and needed emergency medical care, patients with other type of calculi like renal, ureteric and urethra calculus and pregnant women with bladder calculus.

In this study about Fifty patients with bladder calculus were selected and datas like urine examination, ultrasonogram (USG), X ray KUB were noted. The Management performed in those patients were open suprapubic cystolithotomy or transurethral cystolithotripsy or percutaneous cystolithotripsy. Patient's symptoms, socio- economic status, composition of calculus and post- operative complications were recorded. The results were compiled and subjected for statistical analysis using chi-square test. P value less than 0.05 was set significant.

Results

Table I Sex wise distribution of patients

Total- 50		
Gender	Male	Female
Number (%)	30 (64%)	20 (36%)

Out of 50 patients, males were 30 (64%) and females were 20 (36%) (Table I).

Table II Age wise distribution of patients

Age group (years)	Number	P value
11-20	4	0.21
21-30	9	
31-40	10	
41-50	11	
>50	16	

Age group 11-20years comprised of 4, 21-30years had 9, 31-40years had 10, 41-50years had 11 and >50years had 16 patients. The difference was non- significant (P> 0.05) (Table II).

Table III SES wise distribution of patients

SES	Number	P value
I	21	0.01
II	17	
III	4	
IV	6	
V	2	

Socio- economic status (SES) was I seen in 21, II in 17, III in 4, IV in 6 and V in 2 patients. The difference was significant (P< 0.05) (Table III).

Table IV Assessment of symptoms

Symptoms	Number	P value
Pain abdomen	43	0.05
Burning micturition	21	
Fever	17	
Pain radiating to the tip of penis	28	
Hematuria	12	
Urine dribbling	10	
Urine retention	7	
Gravel in urine	5	

Symptoms were pain abdomen in 43, burning micturition in 21, fever in 17, pain radiating to the tip of penis in 28, hematuria in 12, urine dribbling in 10, urine

retention in 7 and gravel in urine in 5 patients. The difference was significant (P< 0.05) (Table IV).

Table V Assessment of post- operative stay

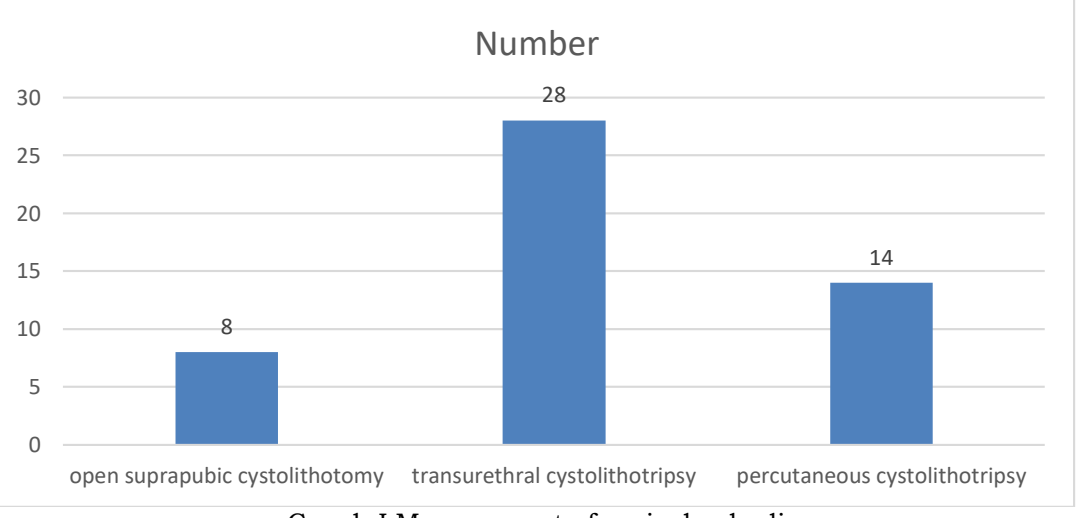
Post- operative stay (days)	Number	P value
<5	35	0.02
5-15	15	

Post- operative hospital stay was less than 5 days in 35 and 5-15 days in 15 patients. The difference was significant (P< 0.05) (Table V).

Table VI Management of vesical calculi

Management	Number	P value
open suprapubic cystolithotomy	8	0.03
transurethral cystolithotripsy	28	
percutaneous cystolithotripsy	14	

Management done was open suprapubic cystolithotomy in 8, transurethral cystolithotripsy in 28 and percutaneous cystolithotripsy in 14 patients. A significant difference was observed (P< 0.05) (Table VI, Graph I).



Graph I Management of vesical calculi

Table VII Composition of bladder stones

Composition	Number	P value
Caph. CaOx, uric acid	24	0.01
CaOx, uric acid	3	
MAP CaOx uric acid	16	
MAP CaOx	3	
Uric acid	2	
CaOx Amm. urate	2	

Composition of bladder stones was Caph. CaOx, uric acid in 24, CaOx, uric acid in 3, MAP CaOx uric acid in 16, MAP CaOx in 3, uric acid in 2 and CaOx Amm. Urate in 2 patients. A significant difference was observed (P< 0.05) (Table VII).

Discussion

It is well established that outlet obstruction is the main causative factor in >75% of patients of bladder lithiasis leading to stasis, infection, alteration in pH of urine, urine supersaturation and heterogeneous nucleation, with calculus formation.[8]It is seen in males above 50 years of age and in such condition, it is due to benign prostatic hyperplasia (BPH) followed by urethral stricture and adenocarcinoma of the prostate.[9]

These calculi are composed of calcium oxalate or magnesium ammonium phosphate (struvite) and uric acid. These calculi may vary in number and more than 1 can be seen in 25- 30% of patients.[10] About 22-34% of patients, urinary tract infection can be associated with the pathogenesis of bladder lithiasis. Proteus sp. is the most commonly isolated microorganism from urine cultures.[11] Proteus and some strains of Pseudomonas and E. coli produce urease, which hydrolyzes urea, leading to ammonia and carbon dioxide, raising the pH and encouraging urinary supersaturation and precipitation of crystals of magnesium ammonium phosphate.[12] The present study assessed clinical findings and management of bladder calculus in patients visiting VMKVMC hospital.

Our results showed that out of 50 patients, males were 30 (64%) and females were 20 (36%). Malladad et al[13]studied 42 patients with vesical calculi, in which males were more affected as compared to females (6:1). In approximately 71% of cases, pain abdomen was the common complaint. 52% patients were using bore well water to drink. The method of treatment was transurethral cystolithotripsy in 50% cases, percutaneous cystolithotripsy in twenty-one percentage cases and open suprapubic cystolithotomy in 29% cases. There was no reported complication with percutaneous cystolithotripsy. Most of the vesical calculi were of mixed variety with predominant composition being calcium phosphate, calcium oxalate, and uric acid.

Our results revealed that age group 11-20years comprised of 4, 21-30years had 9, 31-40years had 10, 41-50years had 11 and >50years had 16 patients. SESI were seen in 21, II in 17, III in 4, IV in 6 and V in 2 patients. Symptoms were pain abdomen in 43, burning micturition in 21, fever in 17, pain radiating to the tip of penis in 28, hematuria in 12, urine dribbling in 10, urine retention in 7 and gravel in urine in 5 patients. Post- operative hospital stay was less than 5 days in 35 and 5-15 days in 15 patients.

Ramachandra et al[14] enrolled 40 patients with vesicle calculus and found that 30% were in age group 51-60 years. Maleswere commonly affected than females. 55% (22) patients reported with pain abdomen and 37.5% (15) with dysuria. Results showed that alkaline urine was present in 60% (24) patients. 10 patients had albumin in urine, 8 patients showed urine sugar whereas 28 patients showed pus cells were found in urine. Ultrasonography of abdomen and pelvis showed

hydroureteronephrosis in 8 patients, cystitis in 10 patients and benign prostatic hyperplasia in 20 patients.

Our results showed that management done was open suprapubic cystolithotomy in 8, transurethral cystolithotripsy in 28 and percutaneous cystolithotripsy in 14 patients. Un-in et al[15] in their study compared lithotripsy with holmium: YAG laser with ballistic lithotripsy in 23 patients and ten patients respectively. All patients were free of calculi, but the use of the holmium laser procedures provided faster and more effective treatments for large calculi. Similar results were shown in study by Ramakrishnan PA et al.[16]

Our results found that composition of bladder stones was Caph. CaOx, uric acid in 24, CaOx, uric acid in 3, MAP CaOx uric acid in 16, MAP CaOx in 3, uric acid in 2 and CaOxAmm. Urate in 2 patients. Shah et al[17] reported 77 (6.4%) pediatric casesout of 1,211 patients of urolithiasis. Maximum cases (55.8%) were seen in age group was 6–10 years. Male: female ratio was 7.6:1.Urinary bladder was the favourable site in 67.5%. Maximum cases were from lower-middle or poor income groups. Calcium was present in 98.7%, oxalate in 87%, phosphate in 84.4% and uric acid in 76.6%. The drawback of our study is small sample size.

Conclusion

Results of the study revealed that in maximum males were affected and transurethral cystolithotripsy was the most common manangement.

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