www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i12.59

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Clinical Study and Management of Calculus in Upper 1/3rd of the Ureter

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Abstract
Aim: *To identify the various clinical presentations and the complications of upper 1/3rd Ureteric calculus, To study the most common type of stone in upper 1/3rd ureter(stone analysis). To study the difference and relative advantage of different treatment modalities so that an appropriate treatment regimen can be instituted for the patient and further complications may be prevented.*
Materials and Methods: *Prospective study of 100 patients diagnosed to have upper ureteric calculi at Kempegowda Institute Of Medical Sciences Hospital, Bangalore from October 2014 to August 2016 and of them 74 underwent operative procedure for upper ureteric calculi. Data was analysed using descriptive statistics and chi-square test.*
Results: *Results were analysed among who underwent operative procedure in different ascepts like, Age (mean age=43.59), Incidence (M>F), dietary habits (mixed diet> veg diet), site of pain (U/L>B/L), complications, need for ESWL(19), different operatives modalities followed by stone analysis.*
Conclusion: *the incidence of urolithiasis has increased drastically, probably due to modern lifestyle and dietary habits and shift in the age distribution of Urolithiasis in recent times. There is an increased number of patients suffering fromthis condition in younger age group. Shift in gender distribution of urolithiasis with age, especially in females in post-menopausal period.*

Introduction

Urolithiasis is one of the common cause for morbidity in modern society. The lifetime prevalence of kidney stone disease is estimated at 1% to 15%, varying according to age, gender, race, and geographic location with the most recent prevalence estimate of 8.8%.[1] It has been suggested that the rise in stone incidence and prevalence seen in the worldwide can be attributed in part to a rise in the detection of asymptomatic calculi through increased utilization of radiographic imaging, particularly computed tomography.[2,3] Edvardsson and colleagues (2013) found that the annual incidence of symptomatic stones did not increase significantly, despite significant increases in the incidence of asymptomatic stones in both genders (from 7 to 24 per 100,000 in men, P < .001, and from 7 to 21 per 100,000 in women< .001).

The highest prevalence of stone disease in whites, followed by Hispanics, Asians, and African-Americans, who had prevalence of 70%, 63%, and 44% of whites, respectively. The gender distribution of stone disease varies according to race. Peaks in incidence in the fourth to sixth decades of life. It has been observed that women show a bimodal distribution of stone disease, demonstrating a second peak in incidence in the sixth decade of life corresponding to the onset of menopause and a fall in estrogen levels .[4,5]

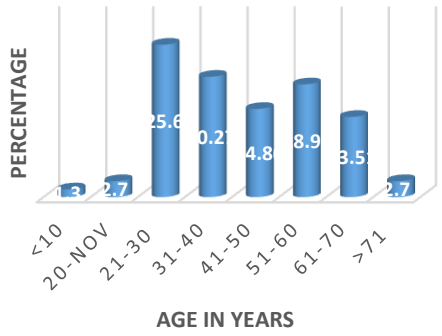
This finding and the lower incidence of stone disease in women compared with men have been attributed to the protective effect of estrogen against stone formation in premenopausal women, owing to enhanced renal calcium absorption and reduced bone resorption.[6,7] In two large prospective cohort studies of men and women, the prevalence and incident risk of stone disease were directly correlated with weight and body mass index (BMI) in both sexes, although the magnitude of the association was greater in women than in men.[8,9] Utilizing the NHANES III (1988-1994) data set, West and colleagues (2008) found that those with a diagnosis of metabolic syndrome were significantly more likely to report a history of kidney stones compared to healthy subjects (8.8% vs. 4.3%, respectively, P < .001). In contrast, the association of obesity and uric acid stone formation is primarily influenced by urinary pH. It has been suggested that the association of obesity with calcium oxalate stone formation is primarily due to increased excretion of promoters of stone formation[10,11]. With westernization of culture, the site of stone formation has also migrated from lower to upper urinary tract. Revolutionary advances in the minimally invasive and non invasive management of stone have greatly facilitated the ease with which stones are removed. However surgical intervention is in just removing the offending stone and do little to the course of the disease. Hence thorough understanding of urinary tract stone is necessary. Therefore this study was conducted in department of general surgery in Kempegowda institute of medical sciences in about 74 patients to know the etiology and appropriate surgical management in treatment of upper ureteric calculi.

Materials and Methods

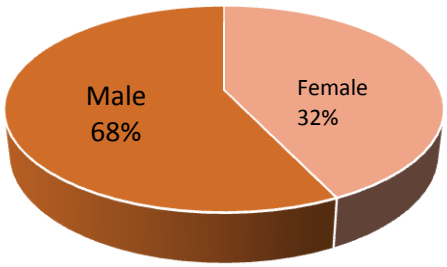
Prospective study of 100 patients diagnosed to have upper ureteric calculi at Kempegowda Institute Of Medical Sciences Hospital, Bengaluru from October 2014 to August 2016. Detailed clinical history including dietary habits and clinical examination was followed at the time presentation and confirmatory radiological investigations was followed up. patients have explained disease, complications /morbidity associated and management protocols have been explained. Clinical presentations, complications. operative modalities followed by stone analysis was studied along with detailed followup for 12 months was carried out. Various treatment modalities adopted in this study were ESWL, URS and stenting, ICL and PCNL.

Results

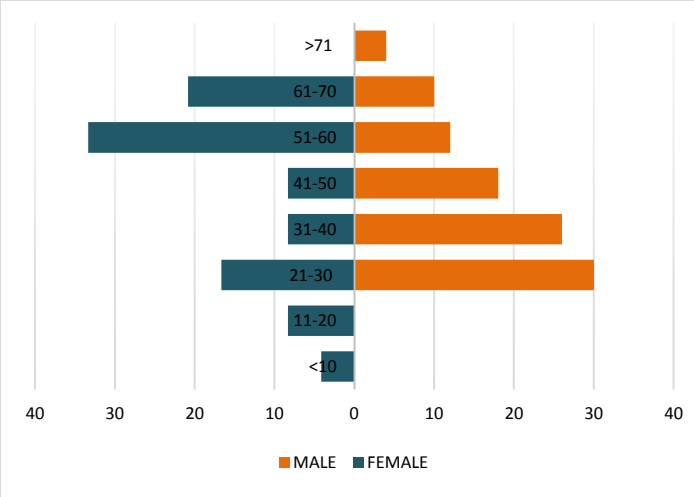
Age Incidence



Sex distribution

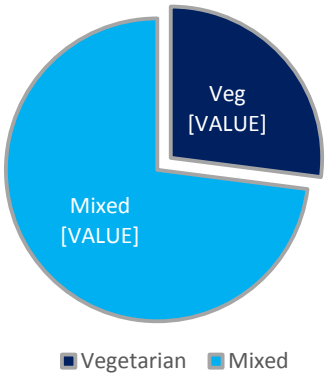


Distribution of Urolithiasis between Two Genders



The incidence in males is more between the age group of 21 to 40 years. In the case series as we see the incidence in females' increases with age and more in the post-menopausal period, this explains bone resorption in the post-menopausal women is one of the reason for ureteric stone formation

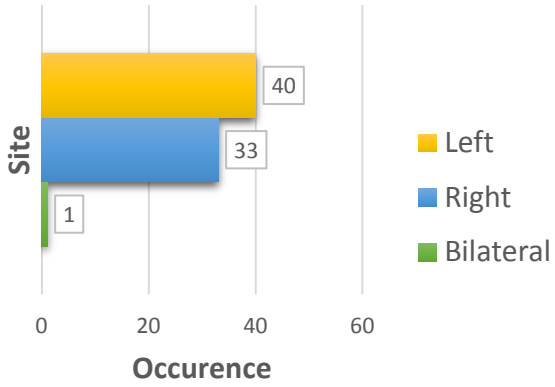
Dietary Habits



Diet	Number of Cases	Percentage
Vegetarian	20	27.03
Mixed	54	72.97
Total	74	100

The incidence of stone formation is more in mixed diet – 72.97% especially with those who eat more of meat.

Site of pain



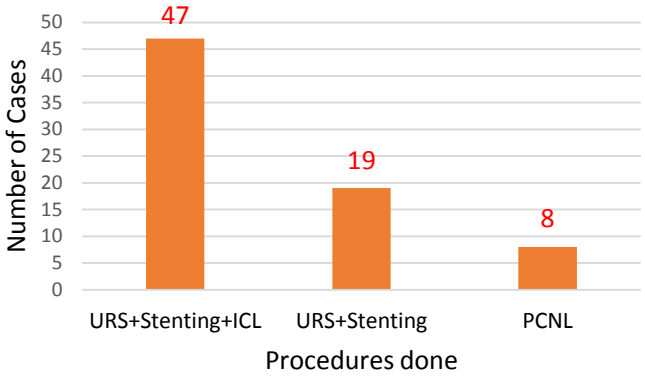
Complications

Complications	No. of Cases
Hematuria	7
UTI	19
HUN	64
ARF	8

Most common complications noticed in this case series is hydroureteronephrosis (64 of 74 patients). As upper ureteric calculi obstructs the outflow and causes backpressure to the kidneys. Which is followed by urinary tract infection, hematuria and acute renal failure.

ESWL	CASES	PERCENTAGE
Underwent	19	25
Others	55	75
TOTAL	74	100

Operative procedure

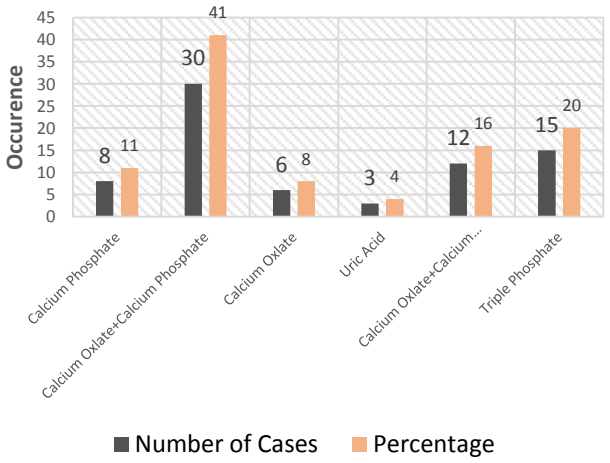


Operative Procedure	Number of Cases
URS+Stenting+ICL	47
URS+Stenting	19
PCNL	8
Total	74

Most of the patient underwent ureteroscopy and ICL and stenting i.e. 66 patients.

Of which 47 patients ICL was sufficient but remaninig 19 patients ICL was not sufficient and had to undergo ESWL.

Stone analysis



Discussion

Urolithiasis is one of the emerging condition today. It is necessary to know the investigation of choice and the right treatment modality including prevention at the level of etiology.

This study was conducted in Kempegowda Institute of Medical Science, Bangalore with a sample size of 74 who presented with renal colic and were diagnosed to have upper ureteric calculi. The study results is as follows: The age incidence ranged from 15 to 80 years with peak incidence being between 21 to 40 years. Incidence among male is more than among female, with ratio between the two M: F - 2:1 As per the observation it suggests that the incidence in female is increasing with the age and the incidence in M: F is almost 1:0.8 to 1:1 in 6 and 7th decade. This shows that the females in the post-menopausal period are more prone for calculus formation which explains the effect of estrogen on bones and bone resorption in post-menopausal period due to deficient estrogen. Calculus formation are seen more in patients who consume meat. This could be due to high protein content in the meat and end product of protein being uric acid, one of the component of the stone. All the patients gave history of pain in either of the loin and had associated complications like HUN, Hematuria, UTI, acute renal failure. Of which HUN was most common due to obstruction in the outflow and causing back pressure to the kidneys. Various treatment modalities adopted in this study were ESWL, URS and stenting, ICL and PCNL.

The operative procedure differs with the size of the stone, for larger and impacted stones PCNL was the treatment of choice, for all other stones ICL with stenting was done and even after ICL, if few fragments were seen then ESWL was done..

In stone analysis the most common stone composition is calcium oxalate followed by triple phosphate and mixed stone. Triple phosphate stone was more commonly seen in patients with UTI.

Conclusion

In recent years, the incidence of urolithiasis has increased drastically, probably due to modern lifestyle and dietary habits. There has also been a shift in the age distribution of Urolithiasis in recent times. Earlier this was considered a disease of middle age, however there is an increased number of patients suffering from this condition in younger age group. There is a shift in gender distribution of urolithiasis with age, especially in females in post-menopausal period. In the past the urinary stone disease used to affect the lower urinary tract more commonly. This trend has also changed in the past few decades with higher number of cases presenting with upper ureteric stones. With the advent of minimal invasive surgeries, the definitive treatment of urolithiasis has become much easier than before, resulting in decline in morbidity of the disease.

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