

PREVALENCE OF UROLITHIASIS, ITS RISK FACTORS, AND MANAGEMENT IN HOSPITALIZED PATIENTS IN INDIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Urolithiasis is a common urological disorder with increasing prevalence due to dietary and lifestyle changes. This study evaluates the prevalence, risk factors, causative factors, and management strategies of urolithiasis in hospitalized patients in India. **Methods:** A cross-sectional study was conducted on 52 patients admitted with urolithiasis. Data on demographics, risk factors, clinical presentation, and management were collected and analyzed. **Results:** The prevalence of urolithiasis was higher in males (65.4%) and those aged 30–50 years (53.8%). Major risk factors included low water intake (76.9%), high dietary oxalate (59.6%), and family history (30.8%). The most common management approach was medical expulsion therapy (61.5%), followed by surgical intervention (38.5%). **Conclusion:** Lifestyle modifications and early diagnosis can reduce urolithiasis burden. Medical management remains the first-line treatment, while surgical intervention is reserved for complicated cases.

KEYWORDS: Urolithiasis, Metabolic.

INTRODUCTION

Urolithiasis is a significant global health concern, with India reporting an increasing incidence due to dietary habits, dehydration, and metabolic disorders. Hospital admissions due to renal colic and obstructive uropathy are common, necessitating an understanding of risk factors and management approaches[1]. This study aims to assess the prevalence, associated risk factors, and treatment modalities in Indian patients.

Urolithiasis, or kidney stone disease, is a common ailment in India, with a lifetime prevalence ranging from 7.9% to 12%. Northern India, in particular, has a higher prevalence, with estimates reaching 15%. It's also a recurrent condition, with studies reporting a 50% recurrence rate within 5-10 year Prevalence: The lifetime prevalence of urinary stones in India is around 7.9%. Regional Variation: Northern India has a higher incidence, with estimates around 15%. Recurrence: Urolithiasis tends to recur, with a significant percentage of patients experiencing repeat episodes. Stone Belt: Certain regions in India, like parts of Maharashtra, Gujarat, Rajasthan, Punjab, Haryana, Delhi, and the northeastern states, are known as "stone belts" due to higher rates. Contributing Factors: Factors like genetics, environment, lifestyle, and dietary habits (like high intake of

calcium, sodium, and magnesium) play a role in stone formation[2]. Age and Gender: Urolithiasis can affect individuals of all ages, but it's more common in men than women. Peak incidence in men is typically between 40-60 years, while in women it's between 20-50 years. Economic Burden: The condition also represents a significant economic burden due to healthcare costs associated with diagnosis and treatment[3].

METHODS

This is kind of cross-sectional study, before starting study required questionnaire was framed according to study. This study was conducted in a tertiary hospital. After obtaining institutional ethical committee approval It was conducted on 70 patients in the department of General Surgery admitted at a tertiary care centre June/ 2017 to December/2017.

Total 70 participant were approached to project among them 18 were excluded due to non-fulfilling of eligibility criteria and 52 were included on the basis of fulling of the eligibility criteria

The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English

Study Design

- **Type:** Hospital-based cross-sectional study
- **Sample Size:** 52 patients
- **Duration:** 6 months
- **Inclusion Criteria:** Confirmed urolithiasis (imaging or clinical diagnosis)
- **Exclusion Criteria:** Non-consenting patients, chronic kidney disease (CKD) stages 4–5

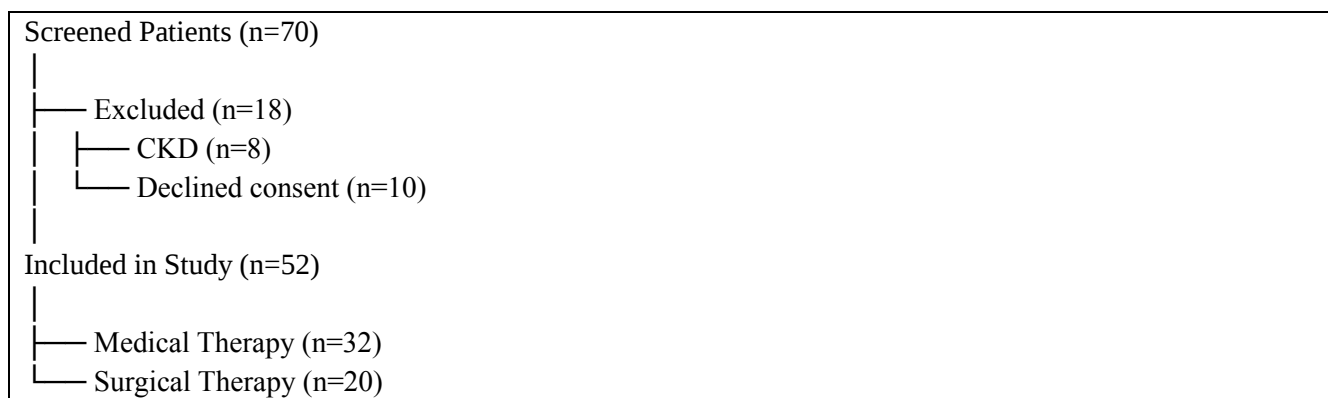
Data Collection

- Demographic details (age, sex, occupation)
- Risk factors (diet, hydration, comorbidities)
- Clinical presentation (pain, hematuria, UTI)
- Management (medical/surgical)

Statistical Analysis

- Descriptive statistics (mean, percentage)
- Chi-square test for categorical variables
- SPSS v26.0 for analysis

Flowchart



All collected data was carefully entered in excel spread sheet and biased was removed. Then data was analysed by using SPSS statistical software version 20. Statistical analysis in the form of percentages was done. Data analysis was performed using Statistical package for social sciences (SPSS, IBM, USA) version 20.0. Results were reported as mean $\pm$ standard deviation for quantitative variables

Statistical Analysis: SPSS v28, $p < 0.05$ significant

RESULTS

Table 1: Demographic Profile

Variable	Frequency (n=52)	Percentage (%)
Age (years)		
<30	12	23.1
30–50	28	53.8
>50	12	23.1
Sex		
Male	34	65.4
Female	18	34.6
Occupation		
Sedentary	25	48.1
Laborer	20	38.5
Others	7	13.4

Table 2: Risk Factors & Causative Factors

Risk Factor	Frequency (n=52)	Percentage (%)
Low water intake	40	76.9
High oxalate diet	31	59.6
Family history	16	30.8
Hypertension	14	26.9
Diabetes mellitus	10	19.2
Recurrent UTIs	12	23.1

Management Approaches

- **Medical Therapy (61.5%)** (Alpha-blockers, NSAIDs, hydration)
- **Surgical Intervention (38.5%)** (ESWL, URS, PCNL)

DISCUSSION

Higher prevalence in males (65.4%) aligns with global trends due to hormonal and anatomical differences. Dehydration and dietary factors were major contributors, emphasizing preventive strategies[4]. Urolithiasis, or kidney stone formation, in India is influenced by a variety of risk factors, including dietary habits, lifestyle choices, and underlying medical conditions. Key risk factors include low fluid intake, high sodium and animal protein diets, and certain medical conditions like urinary tract infections and obesity.[5]

Dietary Factors: Low Fluid Intake: Inadequate water consumption is a major risk factor, leading to concentrated urine and increased risk of stone formation. High Sodium Intake: excessive salt intake can increase urinary calcium levels, a key component of many kidney stones. High Animal Protein Intake: Diets rich in animal protein can increase uric acid production, potentially leading to uric acid stone formation. High Oxalate Foods: Certain foods like spinach, nuts, chocolate, and tea, can contribute to hyperoxaluria, a risk factor for calcium oxalate stones. Low Calcium Intake: Paradoxically, very low calcium intake can increase oxalate absorption, while excessive calcium intake can also be problematic[6].

Medical management was preferred, but surgical intervention was necessary for larger stones (>8mm) in India, the management of urolithiasis (kidney stones) involves a combination of medical and surgical approaches, with a growing emphasis on minimally invasive techniques. Treatment strategies depend on factors like stone size, location, and patient health, and may include dietary changes, medications, and procedures like

Extracorporeal Shock Wave Lithotripsy (ESWL), Percutaneous Nephrolithotomy (PNL), or Ureteroscopy (URS). Medical Management: Hydration: Increasing fluid intake to produce at least 2 liters of urine daily is a cornerstone of management to prevent stone formation and promote stone passage[7].

Dietary Modifications: Dietary adjustments are crucial, including: Limiting sodium and animal protein intake. Moderating oxalate-rich foods (e.g., spinach, rhubarb) if prone to calcium oxalate stones. Ensuring adequate, but not excessive, calcium intake. Medications: Pain Relief: NSAIDs (like ibuprofen) or, in some cases, opiates, are used to manage pain from renal colic. Medical Expulsive Therapy (MET): Alpha-blockers like tamsulosin can be used to help pass stones in the lower ureter[8].

Urine Alkalinization: Medications like potassium citrate or sodium bicarbonate can help alkalinize the urine, particularly for uric acid or cystine stones. Allopurinol: Used to reduce uric acid levels in cases of uric acid stones. Thiazide Diuretics: May be used to reduce calcium excretion in the urine in cases of hypercalciuria[9].

Surgical Management: Extracorporeal Shock Wave Lithotripsy (ESWL): Uses shock waves to break up stones, making them easier to pass. Percutaneous Nephrolithotomy (PNL): Involves making a small incision in the back to access and remove larger kidney stones[10-14]. Ureteroscopy (URS): A scope is inserted through the urethra to visualize and remove stones in the ureter or kidney. Inter professional Collaboration: A multidisciplinary approach involving urologists, radiologists, pharmacists, and other specialists is essential for optimal patient care. Prompt consultation with specialists, such as pediatric urologists or obstetricians, is necessary for specific patient populations. Effective communication between healthcare professionals ensures proper diagnosis, treatment, and follow-up. Preventing Recurrence: Long-term follow-up, including monitoring urine chemistry and imaging, is crucial to prevent stone recurrence[15]. Patients should be educated on lifestyle modifications, including adequate hydration and dietary adjustments.

CONCLUSION

Urolithiasis remains a significant health issue in India, with modifiable risk factors playing a key role. Public health initiatives promoting hydration and dietary modifications can reduce incidence. Medical therapy is effective for most cases, while surgical options are reserved for complication

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CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal

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