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RESEARCH ARTICLE

ASSESS THE RISK FACTORS OF UROLITHIASIS AMONG PATIENTS ATTENDING OPD AT SRI RAMACHANDRA HOSPITAL, SOUTH INDIA, CHENNAI

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INTRODUCTION

Urolithiasis is the third most common urological disease affecting both males and females but predominant among males in a proportion of approximately 2:1. Calculogenesis consisted of intrinsic and extrinsic factors like age, sex, geography, climate, dietary, mineral composition, and water intake (Moeow, 2006). Kidney stone formation or urolithiasis is a complex process that occurs due to imbalance between promoters and inhibitors in the kidneys or urinary tract (Aggarwal et al., 2013). The significant relationship found with renal calculi and risk factors like intake of vegetables, antacid medication, gout, dehydration due to poor water intake and sweating, genetic factors, bladder catheterization, long term bedrest, and bilharziasis (Muhbes, 2012). The 'Afro-Asian stone-forming belt' are located in the countries of the Middle East, North Africa, Mediterranean regions, North-western states of India and Southern states of USA. 'Stone wave' caused by changing food habits and social conditions in the world.

Obesity, high protein contained food, consanguinity, consumption of alcoholic beverages like wine increased the risk of calculosis. 75% of paediatric age group with nephrolithiasis had identified with predisposing factors of renal calculi. (Lopez, and Hoppe, 2010). In the last few years, incidence of urinary stones is increasing with a decrease in age of onset. Researchers predict that by 2050, high temperature due to global warming will give rise of renal calculi (UT Southwestern Medical Center, 2008). Statistics has shown that there is increase in the incidence of renal stones in Tamil Nadu male to female ratio was 1:0.3, men and women suffered from kidney stone with average age of 40-42 years, May to September month was peak period of calculi, which caused economic burden to patients (Vandana and Sundaram, 2016). Life style modifications of smoking 36.03%, alcohol consumption 41.59%, lack of physical activity 42.79%, obesity 54.80% also revealed a high prevalence of this disease. Postmenopausal women with low estrogen levels have an increased risk for kidney stones. Women who have had their ovaries removed are also at increased risk (Nalini Sofia et al.,

2016). The study revealed a high prevalence of kidney stone is due to low fluid intake 72.07%(p=0.000), dehydration 67.56% (p=0.012) and dietary habits of mixed diet 91.59%(p=0.000), high intake of coffee and tea 57.50%, sodium 64.26%, sugar 49.84%. Life style modifications of smoking 36.03%, alcohol consumption 41.59%, lack of physical activity 42.79%, obesity 54.80% also revealed a high prevalence of this disease. Wong *et al* and Ahmed *et al* had concluded that association of metabolic syndrome like diabetes mellitus and urolithiasis are directly proportional as increased urinary pH which predisposed crystal formation in urine. It was also found that abdominal obesity increased 75% of urolithiasis. Sleep deprivation, shift work, bright light exposure at night, obesity also added in the risk factors of urolithiasis. Roudakova and Monga, found that prevalence and incidence of renal stone disease was directly associated with BMI and body size and increasing in childhood. Education to patients regarding behavior change on diet modification, life style changes will minimize ill effects of renal stone formation (Patel and Mehta, 2013). Currently, we can see young population visiting uro and nephro OPDs and undergoing Dialysis which sensitizes us to study this problem to identify the risk factors and the types of urolithiasis.

Aim of the study: The study aimed to determine the risk factors for urolithiasis among patients and to associate the risk factors and types of urolithiasis with selected background variables.

METHODOLOGY

Research approach: The quantitative research method was considered to be the most appropriate approach to achieve the set objectives.

Research design: The research design by the investigator was Descriptive design.

Setting of the study: The study was conducted in the urology and Nephrology OPD in Sri Ramachandra hospital, porur, chennai. Approximately 30 patients attend each OPD per day.

Population: The study population included patients with complaints of calculi in the urinary tract and diagnosed as urolithiasis. The population for the study were both men and women who have complaints and diagnosed as urolithiasis attending urology and nephrology OPD in Sri Ramachandra hospital, Porur, Chennai.

Sample: Patients who were currently diagnosed as urolithiasis and has previous history of renal calculi attending urology and nephrology OPD of Sri Ramachandra hospital, porur, chennai. and those who met the inclusion criteria.

Sample size: A total of 50 patients were used for the study as samples.

Criteria for sample selection: Inclusion criteria weremale, female and transgender, >21years, able to communicate in Tamil and/or English, present and past history of urolithiasis. Exclusion criteria were pregnant and lactating mothers, who were not willing to participate and mentally challenged.

Description of the tool: Self-Structured Tool consisted of three parts: Demographic variables, clinical variables and Risk factors of urolithiasis

Validity: Content validity was obtained from experts in the field of urology and nephrology.

Data collection procedure: A written permission to conduct the study was obtained from the Medical Director, Head of the Department of Urology and Nephrology OPD, Sri Ramachandra Hospital. The Study was conducted from 19th to 24th April 2016. The Investigators verified the health record of the patients and collected the history from those previously and currently diagnosed with renal calculi.

Ethical Clearance: Permission was obtained from the Institute (Sri Ramachandra University) Ethical Committee, Human studies. Informed consent was obtained from every participant after a brief explanation regarding the study by the researchers. Confidentiality was maintained during the data collection.

RESULTS

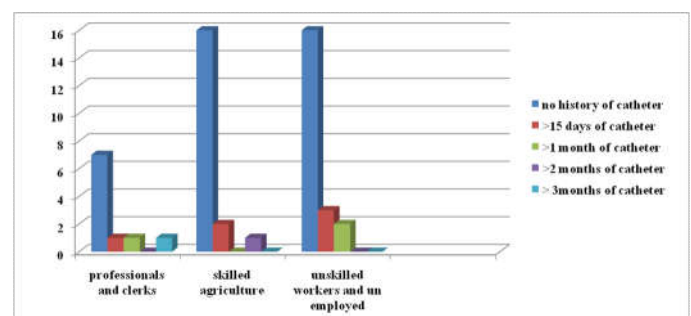


Fig 1. Association of occupation with presence of long term urinary catheter

Table 1. Distribution of patients according to their demographic variables (N=50)

Demographic Variables	No.	%
Age in years		
21-30	00	00
31-40	05	10
41-50	18	36
51-60	27	54
Gender	34	68
Male	16	32
Female		
Education	16	32
No Formal Education	22	44
Primary	08	16
Higher Secondary	04	08
Graduate		
Occupation		
Legislators, Semi officials and Managers	00	00
Professionals	01	02
Technicians and Associate Professionals	00	00
Clerks	04	08
Service Workers and Shop and Market Sales Workers	05	10
Skilled Agriculture and Fishery Workers	14	28
Plant and Machine Operators and Assemblers	05	10
Unskilled Workers	04	08
Unemployed	17	34
Marital Status		
Single	02	04
Married	47	94
Widow/divorce	01	02
Type of Family		
Joint	24	48
Nuclear	26	52
Place of Residence		
Urban	18	36
Rural	23	46
Semi-urban	09	18
Monthly Income (in rupees per year)		
<10,000	27	54
10,000-20,000	22	44
>20,000	01	02

Table 2. Distribution of patients according to their clinical variables (N=50)

Clinical Variables	No.	%
Site of pain		
Abdomen	19	38
Flank	27	54
Pelvic	04	08
None	00	00
Type of pain		
Colicky	26	52
Dull aching	04	08
Wake and ill- localize	00	00
Continuous	05	10
Intermittent	15	30
Radiation of the pain		
Yes	27	54
No	23	46
Pain Numerical rating scale score		
0-3 Mild pain	13	26
4-6 Moderate pain	23	46
7-10 Severe pain	14	28
Present complaints of		
Abdominal, Flank pain radiating to groin	27	54
Haematuria	00	00
Nausea and Vomiting	06	12
Restlessness	03	06
All the above	14	28
Investigation findings		
Blood and Urine test		
Ultrasound	33	66
CT scan	17	34
MRI scan	00	00

Table 3. Distribution of patients according to their risk factors of urolithiasis (N=50)

Variables	No.	%
Family history of urolithiasis		
Yes	06	12
No	44	88
History of recurrent UTI		
Yes	23	46
No	27	54
Drinking fluoridated tap water		
Yes	27	54
No	23	46
Alcohol consumption, if yes amount and type.....		
Yes	13	26
No	37	74
On Calcium supplements		
Yes	17	34
No	33	66
AYUSH treatment (undergone)		
Yes	05	10
No	45	90
Aerated beverages		
Yes	15	30
No	35	70
Congenital renal abnormalities, if yes name it		
Yes	00	00
No	50	100
Previous history of stone disease		
Yes	20	40
No	30	60

Medications		
Acetazolamide (Diamox)		
Indinavir (Crixivan)		
Corticosteroids		
Antacids containing Silica		
Anti-Hypertensive-Triamterene		
Chemotherapeutic agents		
None of the above		
Body Mass Index		
< 18.5 underweight	03	06
18.5-24.9 Normal weight	43	86
25.0-29.9 Overweight	03	06
30.0-34.9 Class I Obesity	01	02
Any history of presence of long term urinary catheter		
No history	39	78
>15 days	06	12
>1 month	03	06
>2 months	01	02
>3 months	01	02
Activity level		
Bed rest	00	00
Sedentary activity	20	40
Moderate activity	30	60
Strenuous activity	00	00
Dietary style		
Protein supplement	04	08
Red meat	32	64
Brown chocolate	14	28
Amount of water intake per day		
<1L	09	18
< 2L	25	50
<3L	15	30
>4 L	01	02
Frequency of urine emptying		
2 nd hourly	05	10
4 th hourly	16	32
6 th hourly	11	22
8 th hourly	18	36
Co morbidity		
Arthritis	05	10
Colitis	00	00
Gout	00	00
Hypertension	21	42
Hyperthyroidism	02	04
Renal tubular acidosis	00	00
Anemia	02	04
Blood cancer	00	00
Nephrocalcinosis	00	00
Diabetes mellitus	10	20
None of the above	10	20

Table 4. Association of gender with pain (N=50)

Gender	Pain score			x ² value p value
	0-3	4-6	7-10	
Male	11	19	4	13.90
Female	2	4	10	0.001 *

*statistically significant at p< 0.05

Table 5. Association of occupation with BMI (N=50).

Occupation	BMI				x ² value p value
	<18.5	18.5-24.9	25-29.9	30-34.9	
Professionals and clerks	1	3	1	0	29.93 0.03*
Service Workers and skilled agriculture	0	18	1	0	
Plant and machine operators	0	4	1	0	
Unskilled workers	1	3	0	0	
Unemployed	1	15	0	1	

*statistically significant at p< 0.05

DISCUSSION AND CONCLUSION

The present study reveals that there was statistically significant association between gender with pain and occupation with BMI. The present study concluded that out of 50 patients 12% had family history of renal calculi, 26% were alcoholic, 46% were having the history of recurrent UTI, 34% were on calcium supplement, 54% were drinking fluoridated tap water, 30% consumed aerated beverages, 10% of them were on AYUSH treatment, 40% had previous history of calculi, 42% were on antihypertensive- Trimeterene, 14% were on corticosteroid. It is noted that 20% were known case of diabetic and 42% were hypertensive, 40% had sedentary activity, 60% had moderate activity. Regarding water consumption 68% of them had <2 litres per day and 36% had the habit of passing urine with the interval of >8 hours. The study was supported by Feneley. et al and Muhbes, that urinary catheter causes calculi due to incomplete bladder emptying. Hess, and Roudakova et al concluded that people with obesity and BMI >30 Kg/ m² were higher risk to develop urinary calculi. It is also supported by the study conducted by Obligado et al that hypertension and obesity were major risk factor for urolithiasis .

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