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Research Article

A Study on Risk Factors among Patients Suffering Urolithiasis

Dr. V. Mishra[1], Dr. Alok Pratap Singh[2]

[1]Consultant Urology Department, Vindhya Hospital & Research Centre Rewa
[2]Associate Professor, Anesthesia Department SSMC Rewa
Corresponding Author : **Dr. Alok Pratap Singh**
[2]Associate Professor, Anesthesia Department SSMC Rewa

ABSTRACT: INTRODUCTION: Having stones at any location in the urinary tract is referred to as urolithiasis. Calcium oxalate and/or phosphate stones account for almost 70% of all renal stones observed in economically developed countries.[2] The average lifetime risk of stone formation has been reported in the range of 5-10%.Many literatures and studies mentioned that there is no exact cause of urinary calculi but there are a number of genetic body reaction to certain metabolic and chemical conditions and life style risks that contribute to renal calculi formation.[5-7] The common risk factors are age, sex, climate, season, stress, fluid intake, occupation, affluence, diet, genetic and metabolic changes.

OBJECTIVES : 1. To study the socio-demographic profile of patients with renal calculi
2. To study the risk factors among patients with renal calculi.

MATERIALS AND METHODS:Total 253 patients of urolithiasis were included in our study and data regarding various socio demographic and risk factors was collected.

RESULTS: Out of total 253 studied patients who were diagnosed to have urolithiasis 147 (58.1%) were males and 104 (41.9%) were females. About 58% patients were between 25-55 years age. Among risk factors, most common risk factor for urolithiasis was non veg diet (in 86% patients), followed by coffee and tea consumption, (in 73%), stress full life (in 49%).

CONCLUSION: Modifiable risk factors like non vegetarian diet, consumption of tea and coffee, high salt intake, less water intake, stress, less physical activities, alcohol intake, play important role in pathogenesis of urolithiasis. So knowledge of these risk factors, and avoidance of these factors specially in whom, those have family history of renal stone, or past history of any stone would be crucial for prevention to this disease.

INTRODUCTION

A kidney stone, or renal calculus is a solid concretion or crystal aggregation formed in kidneys from dietary minerals in the urine. The condition of having kidney stones is termed nephrolithiasis. Having stones in urinary tract is referred to as urolithiasis, and the term ureterolithiasis is referred to stones located in ureters.[1] Kidney stones, which are solid crystals that form from dissolved minerals in urine, can be caused by both environmental and metabolic problems. Calcium oxalate and/or phosphate stones contribute to about 70% of all renal stones occurring in developed countries.[2] The average lifetime risk of stone formation has been reported in the range of 5-10%. Recurrent stone formation is a common problem with all types of stones and therefore an important part of the medical care of patients with stone disease.[3] Clinical manifestations are characterized by lumbar pain of sudden onset (the location of pain depends on the location of stone in the urinary tract) that may be accompanied by nausea and vomiting, gross or microscopic hematuria Diagnosis of renal stone in the acute setting is beyond the scope of the present update but in brief, is represented by urinalysis and imaging.[4]

Formation of renal calculi may occur in kidneys, the ureters or the bladder leading to the damage of the kidneys and block the flow of urine, impair kidneys function in getting rid of body waste products and finally cause renal failure. Many literatures and studies mentioned that there is no exact cause of urinary calculi but there are a number of genetic body reaction to certain metabolic and chemical conditions and life style risks that contribute to renal calculi formation.[5-7] The common risk factors are age, sex, climate, season, stress, fluid intake, occupation, affluence, diet, genetic and metabolic changes.[8]

Kidney stones are commonly seen between 30 and 60 years of age. They affect men more than women.. In India, 12% of the population is expected to have urinary stones, out of which 50% may end up with loss of kidneys or renal damage. Recurrence is a common phenomenon seen in stone formation and hence plays a significant role in management of patients with stone disease. Diet may have a significant impact on the incidence of urinary stones. The rising incidence like other diseases is also contributed by 'Western diet'. Kidney stones were more common among obese(high BMI) individuals than among normal-weight subjects (11.3% vs. 6.1%).[9] Other factors affecting occurrence of stone formation are climate, diet habits and local geographic conditions. Rising global temperatures could lead to an increase in kidney stones. Dehydration has been linked to stone disease, particularly in warmer climates, and global warming will exacerbate this effect. As per capita income increases, the average diet

changes, with an increase in saturated and unsaturated fatty acid; an increase in animal protein and sugar; and a decrease in dietary fibre, vegetable protein and unrefined carbohydrates. Increased animal protein intake, lower potassium intake, lower fluid intake were recently identified to higher stone risk. Higher consumption of fructose has been tied to kidney stone risk. Postmenopausal women are at high risk for kidney stone formation due to low levels of estrogen. Women who have had their ovaries removed are also at increased risk.The researchers discovered that stone formers had a 60% greater risk of developing chronic kidney disease (CKD) and a 40% increased risk of developing end-stage renal disease (ESRD), the most severe form of CKD.[10-15]

OBJECTIVES

1. To study the socio-demographic profile of patients with renal calculi

2. To study the risk factors among patients with renal calculi.

MATERIALS AND METHODS

Total Two hundred and fifty three (253) patients visited urology OPD, at vindhya hospital and research centre and diagnosed to have urolithiasis (by various imaging techniques) during the period between January 2014 and January 2017 (3 year) were selected for this study. After making diagnosis patients were asked about various risk factors, and data was collected.

RESULTS

Out of total 253 studied patients who were diagnosed to have urolithiasis 147 (58.1%) were males and 104 (41.9%) were females. About 58% patients were between 25-55 years age. 196 patients (77.5%) belonged to urban area. Among risk factors, most common risk factor for urolithiasis was non veg diet (in 86% patients), followed by coffee and tea consumption, (in 73%), stress full life (in 49%), excess sweating (48%), low water intake (47%). High intake of salt (43%), lack of physical activity(37%), and alcohol consumption (33%) were also important risk factors. Most of the patients had multiple risk factors.

TABLE 1 SHOWING FREQUENCY DISTRIBUTION OF SOCIO DEMOGRAPHIC FACTORS AMONG STUDY PATIENTS

Sociodemographic factors	Frquency (no.)	Percentage (%)
Age (in years)		
<18	24	9.5
18-25	39	15.5
26-40	78	30.8
41-55	67	26.5
56-70	32	12.6
>70	13	5.1
Gender		
Male	147	58.1
Female	104	41.9
Residence		
Rural	57	22.5
Urban	196	77.5
Education		
Illiterate	015	06
Literate	238	95
Marital status		
Married	058	23
Unmarried	195	77

TABLE-2 SHOWING FREQUENCY DISTRIBUTION OF RISK FACTORS AMONG STUDY PATIENTS

Risk Factors	Frquency (no.)	Percentage (%)
Problem in micturition	53	21
Past history of any stone	62	25
Family history of kidney stone	26	11
Less water intake (< 3 lit/day) daily	119	47
Excess sweating	121	48
BMI <18	05	2
BMI > 30	28	11
Stressful life	124	49
Habits of smoking	71	28
Alcohol consumption	84	33
Lacks of physical activity	93	37
History of hypertension	58	23
History of Diabetes	42	17
History of UTI	24	10
Rapid weight loss	3	1
Habit of late night eating	78	31
vegetarian diet	36	14
Non vegetarian diet	217	86
Consume coffee and tea more than 4 cups per day	185	73
Higher salt intake Frequently	108	43

Discussion

The increasing incidence and recurrence rate of urolithiasis a serious social problem. In our study we found that renal, stone formation is more frequent in males then females, this finding is similar to other studies,[16-18] they found that most of the patients with renal stones were males. This could be due to anatomical differences in urinary tract between males and females; in male urethra is longer than in female which may cause accumulation and stagnation of urine in bladder for longer times. Similar to our study in which about 58% patients were between 25-55 years age, Shamsuddeen SB[19] et al also found that both men and women in their adult age ranging from 25years to 45 years are very much prone to renal calculi. Sofia NH et al also found that nephrolithiasis is more common in men than in women and is more prevalent between the ages of 20 to 40 in both sexes.

Diet is also an important factor for the development of kidney stones, especially genetically susceptible patients and with family history. A diet high in sodium, fats, meat and sugar,

coffee and tea, low in fibre, vegetable protein and unrefined carbohydrates are at increased risk of kidney stones,[20] our study also found that high salt, coffee and tea intake and non vegetarian diet, less intake of water is also common risk factors for urolithiasis. Similar to other studies,[19-21] we also found that Diabetic and Hypertension were other risk factors for renal calculi present in 17% and 23% patients respectively.

The present study indicated that about 10 % of patients were complaining from urinary tract infections, this is in consistent with other studies[17,18,22,23] which mentioned that a person prone to urinary tact infection may be at risk of developing urinary calculi. Okada et al,[24] mentioned in their study that Long-term bed-rest induced renal stone formation. Bihl G et al[16], and Amiel J[24] have shown that complete bed rest for long time and reduction of physical activity may be a risk factor for urinary calculi formation, we also noted that, 37% study patients in our study had restrict physical activities.

CONCLUSION

Urolithiasis is associated with 60% greater risk of developing chronic kidney disease (CKD) and a 40% increased risk of developing end-stage renal disease (ESRD), the most severe form of CKD. In our study we found that apart from family history and genetics , other modifiable risk factors like non vegetarian diet, consumption of tea and coffee, high salt intake, less water intake, stress, less physical activities, alcohol intake, play important role in pathogenesis of urolithiasis. So knowledge of these risk factors, and avoidance of these factors specially in whom, those have family history of renal stone, or past history of any stone would be crucial for prevention to this disease.

REFERENCES

[1] Preminger, GM (2007). "Chapter 148: stones in the urinary tract". In Cutler, RE. The Merck Manual of Medical Information Home Edition (3rd ed.). Whitehouse Station, New Jersey: Merck Sharp and Dohme Corporation.

[2] Global Warming May Lead To Increase In Kidney Stones Disease Science Daily (May 15, 2008)

[3] Ch. Türk (chairman), T. Knoll (vice-chairman), A. Petrik, K. Sarica, C. Seitz, M. Straub, O. Traxer. Guidelines on Urolithiasis. Eur Urol 2007 Dec;52(6):1610-31.

[4] Li J, Kennedy D, Levine M, Kumar A, Mullen J. Absent hematuria and expensive computerized tomography: case characteristics of emergency urolithiasis. J Urol 2001;165(3):782-4.

[5] Devuyst O, Pirson Y. Genetics of hypercalciuric stone forming diseases. Kidney International .2007; 72 (9): 1065-72.

[6] Prié D, Friedlander G. Genetic Causes of Renal Lithiasis.International Bone & Mineral Society (IBMS). 2009; 357- 67.

[7] Abdel Goad EH, Bereczky ZB. Metabolic risk factors in patients with renal stones in KwaZulu Natal: an inter-racial study (Asian and Whites). BJU Int. 2004;93(1):120-3.

[8] Al-Khader, AA: Impact of diabetes in renal diseases in Saudi Arabia. Nephrol Dial Transplant 2001 16:2132–2135.

[9] Al-Mahroos, F, Al-Roomi, K: Overweight and obesity in the Arabian Peninsula: An overview. J R Soc Health 1999 119:251–253.

[10] Ljunghalls, Hedstrand .H: Epidemiology of renal stones in a middle-aged male population. Acta Med Scand 197:439-445; 1975.

[11] Gary C.curhan, Walter C.willett, Eric B.Rimm and Meir J.stampfer. Family history and risk of kidney stones. Jasn.asnjournals.org.

[12] KupPuswamy.B. Manual of socioeconomic status (urban), Manasayan, Delhi, 1981.

[13] Malvinder S.parmar, Kidney stones, BMJ 2004 June 12,328(7453):1420-1424.

[14] Ross WR, McGill JB. Epidemiology of obesity and chronic kidney disease. Adv Chronic Kidney Dis.2006; 13:325–35. [PubMed].

[15] Sakhaee K, Harvey JA, Padalino PK,Whitson P, Park CY. The potential role of salt abuse on the risk for kidney stone formation. The Journal of Urology 1993:150:310- 2.

[16] Bihl G, Meyers A. Recurrent renal stone disease--advances in Pathogenesis and clinical management. Lancet. 2001; 358 (9282): 651-6.

[17] http//www. About-Com .Heath Topics A-Z .Kidney Stones 2010 Adam.about.com/reports/000081-7.htm.

[18] Devuyst O.Pirson Y. Genetics of hypercalciuric stone forming diseases. Kidney International .2007; 72 (9): 1065-72.

[19] Shamsuddeen SB, Bano R, Shammari EA, Enezi SHA. Risk factors of renal calculi. IOSR Journal of Dental and Medical Sciences 2013:6;90-5.

[20] Cappuccio FP, Siani A, Barba G et al. A prospective study of hypertension and the incidence of kidney stones in men. J. Hypertens. 1999; 17: 1017–22.

[21] Batmanghelidj F, Kohlstadt I. Water: a driving force in the musculoskeletal system. In: Scientific Evidence for Musculoskeletal, Bariatric and Sports Nutrition. Boca Raton, Fla.: Taylor & Francis; 2006:127–135.

[22] Costa Bauza A, Isern BP. Factors affecting the regrowth of renal stones in vitro: A contribution to the understanding of renal stone development .Scandinavian Journal of Urology and Nephrology .2005;39:(3):194-9.

[23] Sayer J.A. Renal disease. Nephron Physiology. 2010;118 (1):35-44.

[24] Amiel J. Choong S. Renal Stone Disease: The Urological Perspective. Nephron Clin Pract . 2004; 98: 54-58.