

DIETARY AND DRINKING HABITS IN PATIENTS ADMITTED WITH NEPHROLITHIASIS

Muhammad Umer Farooq, MBBS, House Officer, ATH Abbottabad.

Fakhar Uz Zaman, MBBS, FCPS (Med), Medical Officer, ATH Abbottabad.

Syed Hassan Mustafa, MBBS, FCPS (Med), Medical Officer, ATH Abbottabad.

Abdullah Khan, MBBS, FCPS (Med), Medical Officer, KTH Peshawar.

Muhammad Tariq Shah, MBBS, House Officer, ATH Abbottabad.

Muhammad Wasim Sajjad, MBBS, House Officer, ATH Abbottabad.

Muhammad Waheed Sohail, MBBS, House Officer, ATH Abbottabad.

Muzaffar Islam, MBBS, House Officer, ATH Abbottabad.

Date of Received: 25/04/2018

Date of Acceptance: 02/08/2018

ABSTRACT

Background: The nephrolithiasis is the 3rd most common clinical problem worldwide. Men are at great risk of developing stones. The dietary and drinking factors play an important role in its causation. The present study was conducted to determine the dietary and drinking habits in patients presented with nephrolithiasis to Ayub Teaching Hospital, Abbottabad. **Study design:** This cross-sectional study enrolled 140 patients by convenient sampling. **Setting & Period:** The study was carried out at urology ward of Ayub Teaching Hospital, Abbottabad from November 2016 to June 2017. **Methods:** In this study a self-maintained structured questionnaire was used to interview 140 patients admitted in both male and female urology ward of Ayub Teaching Hospital, Abbottabad. The questionnaire covered the drinking and dietary habits of patients with relevance to determinants such as no of glasses per day, level of education, physical activity, the occupation of patients and source of drinking water. Data was collected through questionnaires and was analyzed using SPSS-23. **Results:** Total of 140 patients were enrolled, 80 (57.1%) were males whereas 60 (42.9%) were females. Most of them 116(82.9%) were from rural areas, 132(94.3%) poor socio economic status, 60(42.9%) drinking water from tap and 80(57.1%) eating vegetables. Most 100(71.4%) of them were illiterate, 92(65.7%) working indoor and 60(42.9%) drinking 5 to 10 glasses per day. **Conclusion:** The study highlights the poor dietary and drinking habits of patients admitted with nephrolithiasis.

Key words: Nephrolithiasis, Urolithiasis, Kidney stones.

Correspondence Address

Muhammad Umer Farooq
MBBS, FCPS (Med),
Medical Officer, ATH
Abbottabad.
Address: District Battagram
Village Qamar Abad Nearer to
Sub-Jail Battagram Hazara
Division KPK
fakharkmcit@gmail.com

Article Citation: Farooq UM, Zaman UF, Mustafa HS, Khan A, Shah TM, Sajjad WM, Sohail WM, Islam M. Dietary And Drinking Habits In Patients Admitted With Nephrolithiasis. *IJAHS*, Jul-Sep 2018;03(01-05):133-137.

INTRODUCTION

The nephrolithiasis is defined as the solid mass formed in the urinary tract. These masses (stones) are formed from the crystals that separate out of urine. The stones are also formed when the crystal forming substances (calcium, oxalate, uric acid) are either high in concentration or those substances preventing the stone formation is low in concentration.¹

The nephrolithiasis is the 3rd most common clinical problem worldwide presenting up to 15% of population in the western countries.^{2,3} The

incidence of stone formation is not uniform throughout the world as, changes are attributed to variation in dietary habits and socioeconomic conditions.⁴ In Pakistan, for instance, one out of 73 admissions in a government hospital are found to be of nephrolithiasis.⁵

Kidney stones disease varies in frequency and stone type between different climates and racial groups. They are uncommon before the age of 20 years, however, their incidence rises between age of 20 and 30 years and then remain constant until the age 70 years after which the incidence falls

again.^{6,7} Men are at greater risk of developing kidney stones as they are two and four times more common in men than women.⁸ Although stones may be asymptomatic but potential consequences include abdominal and flank pain, nausea and vomiting, urinary tract obstruction and infection.⁹

The pathophysiology of the stone formation may be due to infections, hormonal influences, metabolic disturbances, diet factors or obstruction in the urinary system or increasing excretion of chemical components such as oxalate, calcium, carbonate, magnesium, phosphate and cysteine.¹⁰

There are five main types of kidneys stones: calcium oxalate stone, calcium phosphate stone, uric acid stone, struvite stone and cysteine stone. Among these 80% of adults with kidney stones have stones consisting predominantly of calcium oxalate or calcium phosphate with most remaining patients having either struvite or uric acid stones.¹¹

The dietary factors associated with increased stone risk include low fluid intake, low calcium intake and high fructose intake while there is mixed evidence for animal protein, increased sodium, increased sucrose, low magnesium.¹²

This study was carried out to determine the dietary and drinking habits in patients admitted with nephrolithiasis in general population. The study will create awareness among the patients to modify and adapt their life styles to prevent the incidence of nephrolithiasis.

SUBJECTS AND METHODS

This was a cross-sectional study conducted at Urology Outpatient Department(OPD) and Urology Unit of Ayub Teaching Hospital (ATH), Abbottabad from November 2016 to June 2017. One-hundred and forty(140) patients of both genders were included in same population by using non-probability convenient sampling

technique. Data were collected by filling preformed questionnaire including several variables of interest, through asking the questions given in questionnaire by interviewers. Informed consent was taken from all the subjects keeping ethical considerations and privacy of data in view.

Participants of any age and gender were included. Patients with acute symptoms were excluded. Data was analyzed using SPSS-23. Frequencies and percentages were calculated for qualitative variables, and Mean±SD were calculated for quantitative variables.

RESULTS

A total of 140 patients were studied. The minimum age was 8years while the maximum was 75years with the mean of ±16.38. 80 (57.1%) were males while 60 (42.9%) were females. 56 (40.0%) drink 1 to 5 glasses per day, whereas 60 (42.9%), 16 (11.4%) and 8 (5.7%) drink 5 to 10, 11 to 15 and 16 to 20 glasses per day respectively. Similarly, Out of 140 patients , 48 (34.3%), 80 (57.1%) and 12 (8.6%) patients had daily physical activity of 1 to 5 hours, 6 to 10 hours and 11 to 15 hours respectively. Those who were included in 1 to 5 hours group consist of 12 (15.0%) males and 36 (60,0%) females. The 6 to 10 hours group includes mostly males 64 (80.0%) and 16 (26.7%) are females. There were only 4 (5.0%) male and 8 (13.3%) females included in 11 to 15 hours group.

Some other results are shown in the tables.

Out of 140 patients 60 (42.9%), 40 (28.6%) and 40 (28.6%) drink tap,well and spring water

Table 1: Number of times citrus food were consumed in a week

	Frequency	Percentage
Never	12	34.3
One to two	11	31.4
Three to four	7	20.0
Five to six	1	2.9
Daily	4	11.4
Total	35	100.0

Table 2: Occupation of the patient and its relation to food mostly consumed in a week.

Occupation of the patient	Food Consumed in a week				Total
	Meat	Vegetables	Pulses	Rice	
Govt. employee	2 66.7%	1 33.3%	0 0.0%	0 0.0%	3 100%
private employee	0 0.0%	3 75%	0 0.0%	2 25%	5 100.0%
self employee	2 22.2%	6 66.7%	0 0.0%	1 11.1%	9 100.0%
House wife	2 16.7%	9 75%	1 8.3%	0 0.0%	12 100.0%
Not Applicable	3 50.0%	1 16.7%	1 16.7%	1 16.7%	6 100.0%
Total	9 25.7%	20 57.1%	2 5.7%	4 11.4%	35.0 100%

respectively. 112 (80.0%), 8 (5.7%), 4 (2.9%), 8 (5.7%), 4 (2.9%) and 4 (2.9%) patients mostly consumed tea, milk, soft drinks, juices, lassi and green tea respectively. Mostly patients consumed tea and mostly amongst them were uneducated 112 (80.0%), whereas 38 (20.0%) were educated. Majority of patients drink tea 112 (80%) whereas 8 (5.7%) drink milk, 4 (2.9%) drink soft drinks, 8 (5.7%) drink juices, 4 (2.9%) drink lassi and 4 (2.9%) drink green tea.

DISCUSSION

Our results depict the higher prevalence of nephrolithiasis in males (57.1%) than in females (42.9%). A similar study conducted in Iceland (4.3% in men and 3.0% in women) and Iran (6.1% in men and 5.3% in women) also concluded the same inference.¹⁴ Similarly in another study higher rate of renal stone disease were reported in males than in females, with a ratio of three to one (3:1).²⁰

The prevalence of urinary calculi is higher in those who live in mountainous, desert, or in rural areas.²¹ This is exactly according to our results in which 82.9% patients were from rural area while only 17.1% were from urban areas.

Kidney stones are more common in patients of low socio-economics.²⁰ This is in accordance to our results which shows that 94.3% of patients were having lower socio economic status.

A diet rich in oxalates proves pivotal in stone

formation. The more animal protein i.e meat consumed, the greater is the risk for renal calculi and vice versa.¹⁴ In our study, however, meat came in second (25.7%) in the staple foods' list of the patients, after vegetables (57.1%). One suggestion for this difference is the amount of pesticides sprayed on the vegetables, containing all sorts of hazardous salts and chemicals. The small sample size can also be a cause for this deviation.

One survey concluded that a high calcium diet together with a low meat diet actually reduces the risk of developing renal stones by 51%.¹⁸ This is in accordance to our studies. A similar reduction in risk (11%) has been reported by tea, contradicting our results where 80% of the victims were tea-addicts. We believe that the reason for this difference is because more hard water is used to making tea in our area.¹⁹

Citrus juices prevent stone formation due to their high citrate content. This is exactly according to our results as only 5.7% of juices consumer were having stones.²²

Ingestion of deficient amounts of calcium has also been noticed to increase the occurrence of kidney stones.²³ We saw that in our results also, as only 5.7% of patients consuming milk were having kidney stones.

According to a study in USA, incidence rates of 1 and 0.71 were observed in 45,619 men with lowest (<1275mL/day) and highest (≥2500mL/day) intake of water, respectively.¹⁶ Our study is in accordance to their study. The more water flows through urinary system, the lesser are the chances of stasis which disrupts the process of nephrolithiasis.²⁴ Our results favor this assumption. Hard tap water is also a risk factor.¹⁷

A research conducted in New York City Marathon in 1971 showed that there was 3-5 times higher risk of renal stones among the runners and also in people living in warmer regions.¹⁸ Also, our research also indicates that housewives (34.3%)

and self-employed laborers (25.7%) suffered from dehydration due to their life style, making them vulnerable to kidney stones.

CONCLUSION AND RECOMMENDATIONS








Low Socio-economic status, red meat, dehydration, less intake of water is major risk factors of nephrolithiasis. Public awareness about nephrolithiasis needs to be improved. Further studies are required to determine the effect of diet on nephrolithiasis as contradicting evidence is present in literature.

REFERENCES

1. Qaseem A, Dallas P, Forcica MA, Starkey M, Denberg TD. Dietary and pharmacologic management to prevent recurrent nephrolithiasis in adults: a clinical practice guideline from the American College of Physicians. *Annals of Internal Medicine* 2014;161(9):659-67.
2. Farooq M, Hameede A, Anwar M, Haq HM, Bukhari MA. Urinary calculi biochemical profile of stones removed from urinary tract. *Professional Med J Mar* 2007;(14):6-9.
3. Miller NL, Lingeman JE. Management of kidney stones. *BMJ* 2007;334:468-72
4. Copet M, Hoppe B. History epidemiology regional diversities of urolithiasis. *Pediatr Nephrol* 2010;25:49-59.
5. Jamal A, Ramzan A. Renal and postrenal causes of acute renal failure in children. *JCPSP* 2004;14(7):411-5.
6. Curhan GC, Willet WC, Speizer FE, Spiegelman D, Stampfer MJ. Comparison of dietary calcium with supplemental calcium and other nutrients as factors affecting the risk for kidney stones in women. *Annals of Internal Medicine*. 1997 Apr 1;126(7):497-504.
7. Stamatelou KK, Francis ME, Jones CA, Nyberg LM, Curhan GC. Time trends in reported prevalence of kidney stones in the United States: 1976-1994. *Kidney international* 2003;63(5):1817-23.
8. Taylor EN, Stampfer MJ, Curhan GC. Obesity, weight gain and the risk of kidney stones. *Jama* 2005;293(4):455-62.
9. Boyce CJ, Pickhardt PJ, Lawrence EM, Kim DH, Bruce RJ. Prevalence of urolithiasis in asymptomatic adults: objective determination using low dose noncontrast computerized tomography. *The Journal of urology* 2010;183(3):1017-21.
10. Dugawale P, Shariff A, Hendre A, Patil S and Soutakke A. Chemical analysis of stones and its significance in urolithiasis. *Biochemical Research* 2010;21(3):210-15.
11. Moe OW. Kidney stones: pathophysiology and medical management. *Lancet* 2006;367(9507):333-44.
12. Taylor EN, Stampfer MJ, Curhan GC. Dietary factors and the risk of incidence kidney stones in men: new insights after 14 years of follow-up. *J Am Soc Nephrol* 2004;15(12):3225-32.
13. Trincheiri A. Epidemiology of urolithiasis: an update. *Clin Cases Miner Bone Metab* 2008; 5(2): 101-06
14. Robertson WG, Peacock M, Marshall DH. Prevalence of urinary stone disease in vegetarians. *Eur Urol* 1982; 8(6): 334-9
15. Robertson WG, Peacock M, Marshall DH, Speed R. The Prevalence of Urinary Stone Disease in Practicing Vegetarians. In: Vahlensieck W, Gasser G (eds.) *Pathogenese und Klinik der Harnsteine VIII*. 16th ed. UK: Steinkopff; 1982. p 6-14
16. Siener R, Hesse A. Fluid intake and epidemiology of urolithiasis. *EJCN* 2003; 57(2): 47-51
17. APEC Water. Does Hard Water Cause Kidney Stones? [online] [cited: 15 July, 2016] Available from: http://www.freedrinkingwater.com/water_heal/medical/1/1-water-hardness-and-kidney-stones.htm
18. Saxena A, Sharma RA. Nutritional aspect of nephrolithiasis. *Indian J Urol* 2010; 26(4): 523-30
19. Ferraro PM, Taylor EN, Gambaro G, Curhan GC. Soda and Other Beverages and the Risk of Kidney Stones. *CJASN* 2013; 8(8):1389-95

20. Ramello A, Vitale C, Marangella M. Epidemiology of nephrolithiasis. J Nephrol 2000;13:45-50.
21. Lo SS, Johnston R, Al Sameraai A, Metcalf PA, Rice ML, Master JG. Seasonal variation in the acute presentation of urinary calculi over 8 years in Auckland, New Zealand. BJU international. 2010;106(1):96-101.
22. Seltzer MA, Low RK, McDonald M, Shami GC, Stoller ML. Dietary manipulation with lemonade to treat hypocitraturic nephrolithiasis. J Urol 1996; 156:907-9.
23. Curhan GC, Willet WC, Rimm EB, Stampfer MJ. A prospective study of dietary calcium and other nutrients and the risk of symptomatic kidney stones. N Engl J Med 1983; 328: 833-8.
24. Menon M, Koul H: Clinical review 32: Calcium oxalate nephrolithiasis. J ClinEndocrinolMetab 1992;74:703-7.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Muhammad Umar Farooq	Data Collection	
2	Fakhar Uz Zaman Khan	Statistical Analysis and Manuscript writing	
3	Syed Hassan Mustafa	critical Analysis	
4	Abidullah Khan	Proof Reading	
5	Muhammad Tariq Shah	Literature review	
6	Muhammad Wasim Sajjad	Data Collection	
7	Muhammad Waheed Sohail	Data Collection	
8	Muzaffar Islam	Data Collection	