

## ORIGINAL RESEARCH

# Evaluation Of Risk Factor Of Kidney Stone Disease: A Clinical Questionnaire Based Study

<sup>1</sup>Dr. Shishupal Meena, <sup>2</sup>Dr. Pushendra Bansal, <sup>3</sup>Dr. Mamta Gupta, <sup>4</sup>Dr. Ghanshyam Bansal

<sup>1</sup>Junior Specialist (General Medicine), District Hospital, Karauli, Rajasthan, India

<sup>2</sup>Senior Specialist (General Surgery), General Hospital, Gangapur City, Rajasthan, India

<sup>3</sup>Sonologist, Mamta Sonography Centre, Karauli, Rajasthan, India

<sup>4</sup>Senior Specialist (Pediatrics), District Hospital, Karauli, Rajasthan, India

### Corresponding author

**Dr. Ghanshyam Bansal**

Senior Specialist (Pediatrics), District Hospital, Karauli, Rajasthan, India

Email: [drbansalkped@gmail.com](mailto:drbansalkped@gmail.com)

Received: 05 November, 2022

Accepted: 21 December, 2022

## ABSTRACT

**Background:** Kidney stone disease (KSD) is a common issue with a high health care burden that affects the quality of life among the global population. The present study was conducted to assess risk factor of kidney stone disease.

**Materials & Methods:** The present study was conducted among 620 patients over a period of 6 months. The study included self-administered questionnaire. All of the analyses were performed using State V.12. p values < 0.05 were considered as statistically significant.

**Results:** The study was conducted among 320 patients. Out of them, 59.37% were males and 40.62% were females. The most common risk factor for kidney stone was Mixed diet (91.25%) followed by did not drink required water (2-3 lit/day) daily (71.87%).

**Conclusion:** The study concluded that there was a significant relationship between diet, family history, low fluid intake and the formation of renal calculi.

**Keywords:** Risk Factor, Kidney Stone, Nephrolithiasis.

## INTRODUCTION

Kidney stones are hard deposits of minerals (calcium, oxalate and phosphate) which are formed from dissolved minerals in the urine and are usually excreted in the urethra.<sup>1</sup> The formation of kidney stones known as nephrolithiasis. Kidney stones are an aggregation of crystalline structures that build up in the nephrons of the kidney. These crystalline structures impair the normal functioning of the kidney and often require costly interventions such as pharmacological treatment, laser and radio bombardment, and surgical interventions (if severe).<sup>2</sup> Kidney stones are classified into calcium oxalate, calcium phosphate, uric acid, cysteine, struvite, and mixed stones types, depending on the material of the stones. Calcium stones account for almost 70–80% of all kidney stones.<sup>3</sup> Kidney stones are quite common and usually affect people who are between 30 and 60 years of age. They affect men more than women. It is estimated that renal colic (severe pain caused by a kidney stone) affects about 10-20% of men, and 3-5% of 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.<sup>4</sup> Research on urological patients has shown that the incidence of kidney stones can be associated with sex, race, geographic region, occupation, hot climate, positive family history, unhealthy diet (excessive intake of caffeine, salt, dairy products, animal proteins and fat), smoking, alcohol consumption, physical activity, obesity, low fluid intake, dehydration, socioeconomic status, education, water quality, high intake of vitamins D and C, genetic background and comorbid metabolic disorders (diabetes mellitus, hypertension, chronic kidney disease, and cardiovascular disease).<sup>5</sup> The present study was conducted to assess risk factor of kidney stone disease.

## MATERIALS & METHODS

The present study was conducted among 320 patients over a period of 6 months. Informed consent were taken from the patients after explaining them the study. The study included self-administered questionnaire, which include the recurrence of stone formation, family history, and water intake, BMI, dietary habits etc. All of the analyses were performed using State V.12. p values < 0.05 were considered as statistically significant.

## RESULTS

The study was conducted among 320 patients. Out of them, 59.37% were males and 40.62% were females.

The most common risk factor for kidney stone was Mixed diet (91.25%) followed by Did not drink required water (2-3 lit/day) daily (71.87%).

**Table 1: Distribution According to Gender**

Gender	N(%)
Male	190(59.37%)
Female	130(40.62%)

**Table 2: Association of Risk factors with Renal calculi patients**

Risk factors	N(%)
Already stones in their lifetime	130(40.62%)
Family history of kidney stone	80(25%)
Did not drink required water (2-3 lit/day) daily	230(71.87%)
Sweat a lot every day	220(68.75%)
Used NSAID frequently	85(26.56%)
BMI between < 25 and ≥39.99	180(56.25%)
Pure vegetarians	20(6.25%)
Non vegetarians	8(2.5%)
Mixed diet	292(91.25%)
Consume coffee and tea more than 8 ounce a day	186(58.12%)
Consume soft drinks	210(65.62%)
Higher sodium intake	140(43.75%)
Frequently consume processed foods	145(45.31%)

## DISCUSSION

The symptoms of kidney stone are related to their location whether it is in the kidney, ureter, or urinary bladder.<sup>6</sup> Initially, stone formation does not cause any symptom. Later, signs and symptoms of the stone disease consist of renal colic (intense cramping pain), flank pain (pain in the back side), hematuria (bloody urine), obstructive uropathy (urinary tract disease), urinary tract infections, blockage of urine flow, and hydronephrosis (dilation of the kidney). These conditions may result in nausea and vomiting with associated suffering from the stone event.<sup>7</sup>

The study was conducted among 320 patients. Out of them, 59.37% were males and 40.62% were females. The most common risk factor for kidney stone was Mixed diet (91.25%) followed by Did not drink required water (2-3 lit/day) daily (71.87%).

The stone development is more commonly found in male patients than female patients. A study focusing on the prevalence of stone development in the United States places the difference between men and women as high as 2 times.<sup>8</sup>

The effects of sex hormones (estrogens and androgens) on urinary oxalate and calcium can be responsible for the higher risk of kidney stone development in men. Estrogen prevents the formation of kidney stones by increasing the production of citric acid.<sup>9</sup>

Dai *et al.* reported a strong protective effect of fluid intake on preventing stone formation in men. Men drinking >2,000 mL/day were half as likely to have renal stones compared with men drinking <500 mL/day. Apart from the total fluid intake, more studies have focused on the role of specific beverages on renal stones, but their results were conflicting.<sup>10</sup>

High consumption of vegetables could also lead to renal stone production, and it was also described in other studies.<sup>11</sup>

Diet plays an important role in the development of kidney stones, especially in patients who are predisposed to this condition. A diet high in sodium, fats, meat and sugar, low in fibre, vegetable protein and unrefined carbohydrates are increase the risk of kidney stones. Oxalate is found in green beans, tomatoes, nuts, chocolates and tea which increase the risk for kidney stones. Vegetarians have a decreased risk of developing stones. Studies have shown that even among meat eaters those who ate higher amounts of fresh fruits and vegetables had a lower incidence of stones. Studies have shown that even among meat eaters those who at higher amounts of fresh fruits and vegetables had a lower incidence of stones.<sup>4</sup>

Taylor *et al.* reported a positive correlation of the risk of kidney stones development with BMI and waist circumference (WC).<sup>12</sup>

## CONCLUSION

The study concluded that there was a significant relationship between diet, family history, low fluid intake and the formation of renal calculi.

## REFERENCES

1. Sofa NH, Walter TM, Sanatorium T. Prevalence and risk factors of kidney stone. *Glob J Res Anal.* 2016;5(3):183–7.
2. Shin S, Srivastava A, Alli NA, Bandyopadhyay BC. Confounding risk factors and preventative measures driving nephrolithiasis global makeup. *World J Nephrol.* 2018;7(7):129-142. doi:10.5527/wjn.v7.i7.129.
3. Nikpay S, Moradi K, Azami M, Babashahi M, Otaghi M, Borji M. Frequency of kidney stone diferent compositions in patients referred to a Lithotripsy Center in Ilam, West of Iran. *J Pediatr Nephrol.* 2016;4(3):102–7.
4. Sofia NH, Walter TM, Sanatorium T. Prevalence and risk factors of kidney stone. *Global Journal For Research Analysis.* 2016 Mar 5;5(3):183-7.

5. Khalili P, Jamali Z, Sadeghi T, Esmaeili-Nadimi A, Mohamadi M, Moghadam-Ahmadi A, Ayoobi F, Nazari A. Risk factors of kidney stone disease: a cross-sectional study in the southeast of Iran. *BMC urology*. 2021 Dec;21:1-8.
6. S. B. N. Kumar, K. G. Kumar, V. Srinivasa, and S. Bilal, "A review on urolithiasis," *International Journal of Universal Pharmacy and Life Sciences*, vol. 2, no. 2, pp. 269–280, 2012.
7. J. M. Teichman and M. H. Joel, "Acute renal colic from ureteral calculus," *New England Journal of Medicine*, vol. 350, no. 7, pp. 684–693, 2004.
8. Soucie JM, Thun MJ, Coates RJ, McClellan W, Austin H. Demographic and geographic variability of kidney stones in the United States. *Kidney Int*.1994;46:893–899.
9. Altaf J, Arain AH, Kella NL, Rehman SU. Chemical analysis of urinary stones and its locations associated to urinary tract. *J Liaquat Univ Country: Pakistan*. 2013;12(3):203–7.
10. Dai M, Zhao A, Liu A, You L, Wang P Dietary factors and risk of renal stones: A case-control study in Southern China *J Ren Nutr* 2013; 23 e21 8.
11. Wang J, Luo GT, Niu WJ, et al.: Risk factors for the kidney stones: a hospital-based case-control study in a district hospital in Beijing. *J Peking Univ*. 2013, 1:971-4.
12. Taylor EN, Stampfer MJ, Curhan GC. Obesity, weight gain, and the risk of kidney stones. *JAMA*. 2005;293(4):455–62.