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Short Communication

Prevalence of Kidney Stones among the Respondents of Vaniyambadi Taluk, Vellore District, Tamil Nadu, India

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Abstract

This article surveyed the prevalence of kidney stones among the respondents of Vaniyambadi Taluk of Vellore district. Vaniyambadi Taluk is fully surrounded by industries like leather, tannery and construction industries. The chemical effluents from these industries are being discharged in the nearby areas which get mixed with the ground water. The respondents use the ground water for drinking and agricultural purposes. There is a general prevalence of renal calculi around these areas. The prevalence of calculi based on sex, age and size (mm) of the kidney stones were evaluated. The recommendations and dietary management of the kidney stones are also suggested in the present study.

Keywords: Kidney stones, Vaniyambadi Taluk, Vellore district, leather industries, dietary management.

Introduction

Nephrolithiasis and urolithiasis is the medical term for kidney stones and ureteric stones. Kidney stone is an ancient disorder of the urinary tract which is not a product of modern life and it's most common of all. Evidence of kidney stones has been found in an Egyptian mummy estimated to be more than 7,000 years old. Children getting kidney stones has also become more common in recent years (Smith *et al.,* 2010). In India, it affects nearly 2 million people every year and the life time risk is about 20% in those having this disorder. Northern part of India is defined as the stone forming belt and the incidence is low in Southern part. Most of the human being will develop a kidney stone at some time in their life. Kidney stones happen in 1 in 10 individuals in their lifetime. Kidney stone is a common disorder responsible for substantial human suffering and economic cost to society. Kidney stones most commonly affect both males and females. Kidney stone like lumps that can develop in one or both of the kidneys (Lee *et al.,* 2002; Stamatelou *et al.,* 2003). Populations that consume diets rich in animal protein have a higher risk of stones than those with a more vegetarian diet. The risk of forming a stone is increased further by a high intake of refined sugar, salt and oxalate rich foods (Teichman, 2004). The exact cause of kidney stones cannot always be found. Doctors do not always know what causes a stone to form. While certain foods may promote stone formation in people who are susceptible, scientists do not believe that eating any specific food causes stones to form in people who are not susceptible.

A person with a family history of kidney stones may be more likely to develop stones. Urinary tract infections, kidney disorders such as cystic kidney diseases, and certain metabolic disorders such as hyperparathyroidism are also linked to stone formation. In addition, more than 70% of people with a rare hereditary disease called renal tubular acidosis develop kidney stones. Cystinuria and hyperoxaluria are two other rare, inherited metabolic disorders that often cause kidney stones. In cystinuria, too much of the amino acid cysteine, which does not dissolve in urine can lead to the formation of stones made of cysteine. A disorder of uric acid metabolism gout, excess intake of vitamin D, urinary tract infections, and blockage of the urinary tract may also cause kidney stones (Van Drongelen *et al.,* 1998). People who form kidney stones often have metabolic or other abnormalities detectable on urinary testing. The common abnormalities include low urinary volume, hypercalciuria, hyperoxaluria, hyperuricosuria and hyperoxaluria. There is, however, significant overlap with healthy controls who also often have biochemical 'abnormalities', albeit less frequently (Leonetti *et al.,* 1998; Curhan *et al.,* 2001). People who is suffering from kidney stone problems may experience, nausea, vomiting, pain in the lower abdomen and back pain (kidney side part of the body), testicle or urinary tract, dribbling of urine (Abate *et al.,* 2004). Thus, keeping the above points in mind, this study surveyed the prevalence of kidney stones among the respondents of Vaniyambadi Taluk of Vellore district.

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Table 1. Prevalence of kidney stones among the respondents of Vaniyambadi Taluk of Vellore district.

Age group (years)	No. of patients	Gender		Kidney stone size	Kidney affected	
		Male	Female		Right	Left
21-30	8	5	3	6 -11 mm	2	5
31-40	15	7	8	5-20 mm	10	6
41-50	11	9	2	4-20 mm	4	9
51-60 above	16	10	6	3-16 mm	11	9

Materials and methods

Study population: This survey was conducted among the respondents attending M. Farooq Clinic, Vaniyambadi, Vellore district. The prevalence of kidney stone cases was evaluated using the most important symptoms based on the discussion with consulting urologist. Respondents affected by kidney stones (n = 50) who visited the hospital for a routine physical examination were invited to participate in this survey. Details of the respondents namely age, sex and their kidney stone size (mm) were collected from their hospital data. To screen for the presence of kidney stones, all participants underwent an ultrasound examination that was performed by attending physicians in the hospital.

Results and discussion

The prevalence of calculi based on sex, age and size (mm) of the kidney stones were evaluated. We found males were affected more than the females by calculi with 4 mm to 20 mm, particularly in the age group of 31-40 and 51-60 years (Table 1). Majority of the respondents belonged to the age group of 51-60 years and their calculi were in the size of 3-16 mm affecting the right kidney the most. The youngest age group of the respondents (21-30 years) had calculi of 6-11 mm affecting the left kidney the most. The calculi found were primarily the calcium oxalate crystals (Fig. 1). Kidneys remove extra water and wastes from the blood, converting it to urine. They also keep a stable balance of salts and other substances in the blood. Kidney stone are hard deposits of minerals and acid salts that stick together in concentrated urine. The waste products in the kidney can occasionally form crystals that collect around the inside of the kidney overtime, the crystals may build up to form a hard stone like lump forming renal calculi. Muscle relaxing medications can be used help pass medium sized stones. Larger stones may get stuck as they exit the renal pelvis or take longer time to move through the ureter, causing severe pain and other symptoms. Then they usually need to be broken up by sound waves or surgically removed (Taylor *et al.*, 2005; Romero *et al.*, 2010).

Conclusion

A simple and most important lifestyle change to prevent stones is to drink more liquids-water is best. Drink at least 10 to 12 cups (2.5 to 3 L) per day.

Fig. 1. Kidney stones of varying sizes obtained from the respondents of Vaniyambadi.

Half of all fluids taken should preferably be water. If you tend to form stones, you should try to drink enough liquids throughout the day to produce at least 2 quarts of urine in every 24-hour period. People who form calcium stones used to be told to avoid dairy products and other foods with high calcium content. But recent studies have shown that foods high in calcium, including dairy products, may help prevent calcium stones. People with chronic urinary tract infection and stones will often need the stone removed if the doctor determines that the infection results from the stone's presence. Patients must receive careful follow-ups to be sure that the infection has cleared. Patients should be told to avoid food with added vitamin D and certain types of antacids that have a calcium base. To conclude, we can say that Vaniyambadi respondents are mostly affected by kidney stones. The reason for the formation of kidney stone may be their lifestyle and the substances that are present in their drinking water which are majorly affected by the effluents of nearby industries.

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References

1. Abate, N., Chandalia, M. and Cabo-Chan, A.V. 2004. The metabolic syndrome and uric acid nephrolithiasis: novel features of renal manifestation of insulin resistance. *Kidney Int.* 65: 386-392.
2. Curhan, G.C., Willett, W.C. and Speizer, F.E. 2001. 24-hour urine chemistries and the risk of kidney stones among women and men. *Kidney Int*. 59: 2290-2298.
3. Lee, Y.H., Huang, W.C. and Tsai, J.Y. 2002. Epidemiological studies on the prevalence of upper urinary calculi in Taiwan. *Urol. Int.* 2002. 68: 172.
4. Leonetti, F., Dussol, B. and Berthezene, P. 1998. Effect of dietary control of urinary uric acid excretion in calcium oxalate stone formers and non-stone forming controls. *Neph. Dial. Transpl.* 13: 617-622.
5. Romero, V., Akpinar, H. and Assimos, D. 2010. Kidney stones: A global picture of prevalence, incidence, and associated risk factors. *Rev. Urol*. 12: e86-e96.
6. Smith, J., Mattoo, T.K. and Stapletlon, F.B. 2010. Patient information: Kidney stones in children. Retrieved online at http:// www.uptodate.com topic.do?topicKeyLrR
7. Stamatelou, K.K., Francis, M.E. and Jones, C.A. 2003. Time trends in reported prevalence of kidney stones in the United States: Kidney International 2003; 19761994; 63: 1817.
8. Taylor, E.N., Stampfer, M.J. and Curhan, G.C. 2005. Obesity, Weight gain, and the risk of kidney stones. *JAMA*. 293: 455-462.
9. Teichman, J.M.H. 2004. Acute renal colic from ureteral calculus. *New Engl. J. Med.* 350(7): 684-693
10. Van Drongelen, J., Kiemeney, L.A. and Debruyne, F.M. 1998. The impact of urometabolic evaluation on the prevention of urolithiasis: A retrospective study. *Urol.* 52: 384-391.

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