PHARMA SCIENCE MONITOR
AN INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES

EPIDEMIOLOGY OF RENAL STONE AILMENT IN FEW DISTRICT OF GUJARAT STATE

Vyas Amit S. *[1], Patel Mandev B.[2], Patel Ajay I.[3] and Joshi Namrata R.[4]

[1] Researcher Singhaniya University, Rajasthan, India
[2] K. B. Raval College of Pharmacy, Gandhinagar, India
[3] Zydus Research Center, Ahmedabad, India
[4] Smt. N.M. Padaliya Pharmacy College, Ahmedabad, India

ABSTRACT

A study was conducted for Urolithiasis, mainly focused on renal, Ureter and a gall stone, to check their respective prevalence, probable causes, awareness, and drug utilization and evaluates efficiency of different therapies in population of Gujarat. Detailed questionnaires were designed to collect data randomly from 200 patients of rural and urban area of Ahmedabad and Mehsana district. Male with stone was found 2.5 times than of female consuming veg. food and with peak age of 30-40 age groups. Main type stone found was of kidney stone with upper Ureter. Female were more found with gall stone as compare to male. Majority of patients were found to have family history of stone. Major cause found for the stone was dehydration and increase amount of salt in normal dietary water. Main symptoms were back pain along with nausea and vomiting. Pain killer, antibiotics and α blocker tamsuloin were used in allopathic treatments while cystone, neeri and lithex were used as Ayurvedic preparations for relief from stone. So it is reasonable to conclude that proper awareness and proper combination of drug therapy are necessary for the better treatment of renal stone. In addition patients should also counsel to determine the probable cause stone as for stone prevention is better than cure.

Keywords: kidney stone, gall stone, Ureter.

INTRODUCTION

Human being is gifted with 4 vital organs, Heart, liver, kidney and lungs. The human kidneys are paired organs, which are positioned just in front of the 11th and 12th ribs. The kidneys are responsible for filtering water and other substances from the blood. The combination of these filtered substances and water is known as urine. Kidney stones (called renal calculi from Latin *ren, renes*, "kidney" and *calculi*, "pebbles" [1] in medical parlance) are solid concretions or crystal aggregations formed in the kidneys from dietary minerals in the urine. The first evidence of urinary stones was found in an Egyptian mummy at E1 Amrah – Egypt 4800 B.C. Kidney stones are a relatively common problem. Kidney stone is termed as “Silent Disease Kidney stones are classified by their

location in the kidney (nephrolithiasis), ureter (ureterolithiasis), or bladder (cystolithiasis), or by their chemical composition (calcium-containing, struvite, uric acid, or other compounds). The risk of developing nephrolithiasis in normal adults appears to be lower in Asia (1-5 %) than Europe (5-9%) and North America (12% in Canada, 13 % in USA). The highest risk was reported in Saudi Arabia (20.1%). [2]. Approximately 350-thousand Americans have new stones each year. In spite of the relative frequency of this extremely painful condition, the epidemiology of renal stones is not well developed. It has been suggested that renal stones are associated with increased age. [3] About 5% of American women and 12% of men will develop a kidney stone at some time in their life, and prevalence has been rising in both sexes. Approximately 80% of stones are composed of calcium oxalate (CaOx) and calcium phosphate (CaP); 10% of struvite (magnesium ammonium phosphate produced during infection with bacteria that possess the enzyme urease), 9% of uric acid (UA); and the remaining 1% are composed of cystine or ammonium acid urate or are diagnosed as drug-related stones. [4] Kidney stones are a significant source of morbidity. 80% of those with kidney stones are male. Men most commonly experience their first episode between age 30–40 years; while for women the age at first presentation is somewhat later. In addition, those who develop kidney stones have a 50% risk of having another stone within 5-10 years. White patients are affected by kidney stones more than African American, and the maximum incidence occurs in the 30-50 year old age group.

Nephrolithiasis is a multifactorial disease related to genetic disorders and environmental factors. Kidney stones are more usually observed in adults and are associated with several metabolic and anatomical disorders. The major anatomical abnormalities found were obstruction of the ureteropelvic junction, horseshoe kidney, complete or incomplete duplicated ureter, bifid pelvis, and medullary sponge kidney, are known to be responsible for stone formation. [5]

Urolithiasis refers to stones originating anywhere in the urinary system, including the kidneys and bladder. [6] Nephrolithiasis (from Greek nephros, "kidney" and lithos, "stone") refers to the presence of such calculi in the kidneys. Calyceal) calculi refer to aggregations in either the minor or major calyx, parts of the kidney which pass urine into the ureter (the tube connecting the kidneys to the urinary bladder). The condition is called

ureterolithiasis when a calculus or calculi are located in the ureter. Stones may also form or pass into the bladder, a condition referred to as cystolithiasis. [7]

Colic is independent of body position or motion and is described as a boring or burning sensation associated with nausea and vomiting. Stones less than 5 mm in diameter have a high chance of passage; those of 5–7 mm have a modest chance (50%) of passage, and those greater than 7 mm almost always require urological intervention. [4]

In India, approximately 5 -7 million patients suffer from stone disease and at least 1/1000 of Indian population needs hospitalization due to kidney stone disease. In India, the "stones belt" occupies parts of Maharashtra, Gujarat, Punjab, Haryana, Delhi and Rajasthan. In these regions, the disease is so prevalent that most of the members of a family will suffer from kidney stones sometime in their lives. [8] With increasing number of stone cases in Gujarat population, the present study was commenced with following main objectives:

1. To confirm the prevalence of renal stone disease in different area of Gujarat and also to check the individual prevalence for renal stone, ureter stone as well as gall stone in the same.
2. To check the characteristics of patients- age, gender, lifestyle etc.
3. To find out probable causes for stone from the survey.
4. To check for the awareness of renal stone, ureter stone as well as gall stone patients for the consciousness of the treatment.
5. To evaluate the efficacy of different Pharmacological and Non Pharmacological treatment for stone.
6. Finally, to summarize different factors, which are responsible for prognosis of the disease. So the cause of disease is investigated and treatment criteria may be decided.

METHODOLOGY

Patients are so unaware about major symptoms of disease so they do not prefer to go to clinic to take treatment until pain progress and also they are not undergoing for clinical tests after stone incidence often. So, we have surveyed different rural and urban areas of Ahmedabad and Mehsana district of Gujarat for epidemiological study of renal stone, ureter stone as well as gall stone. Patients were contacted individually and the data

obtained by direct questionnaire method with their moral support to us. Data obtained by counseling at patient's home as well as from pathology lab and interviewing physicians. Data regarding patients are Age group, Sex, Life style, Type of stress, Family history, Drug treatment, and stone analysis (Fig. 1- 6).

Figure 1: No. of Patients of Each sex With renal stone

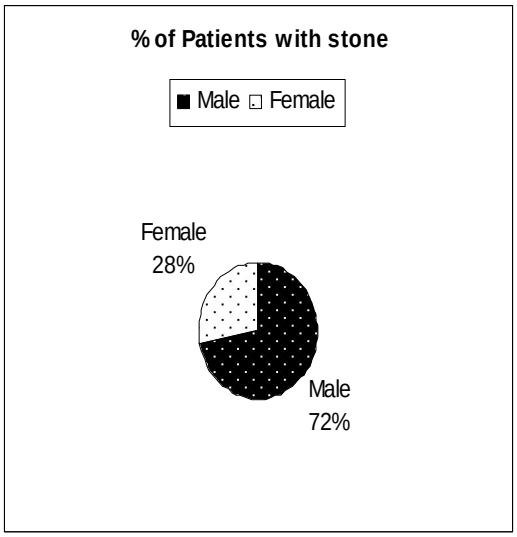


Figure 2: Food Habit of Patients

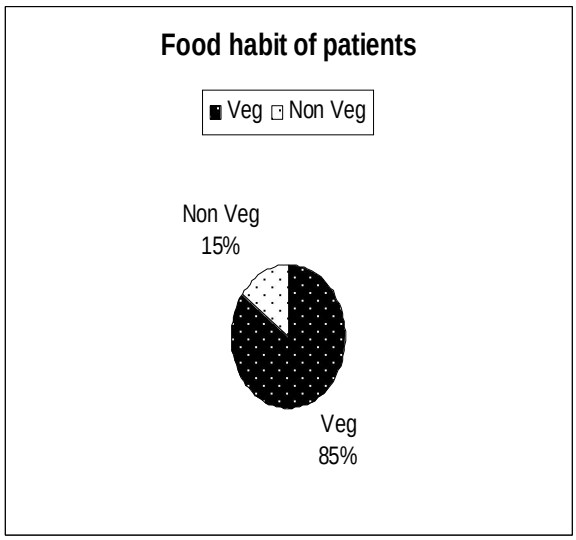
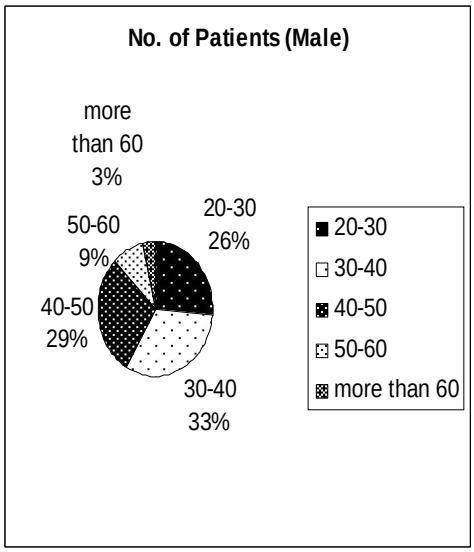


Figure 3: No. of Patients of Each sex within different age group with stone



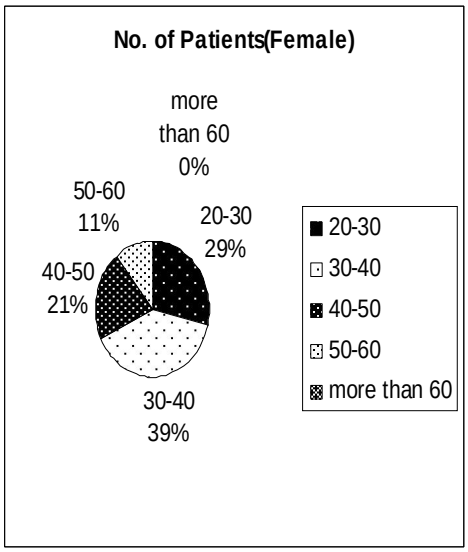


Figure 4: Symptoms observed in Patients

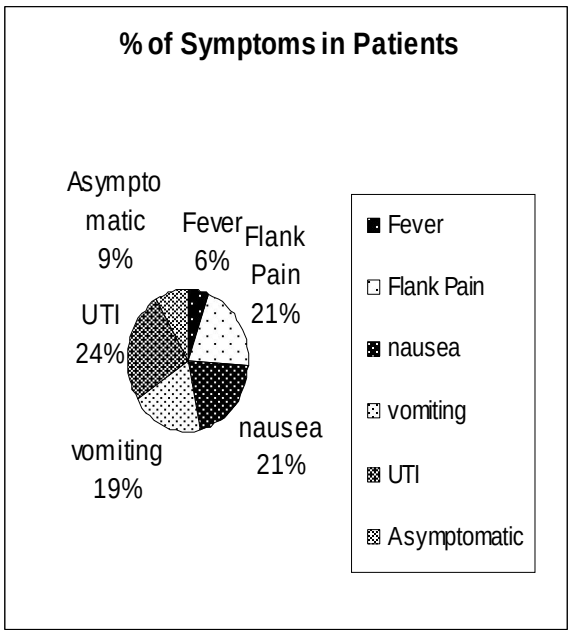


Figure 5: % Patients with renal stone

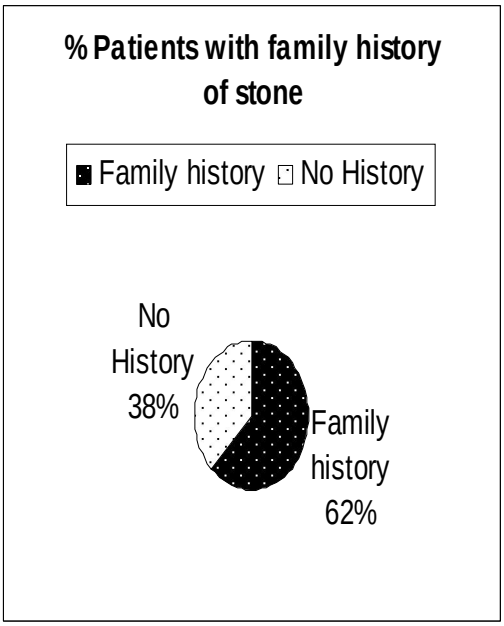
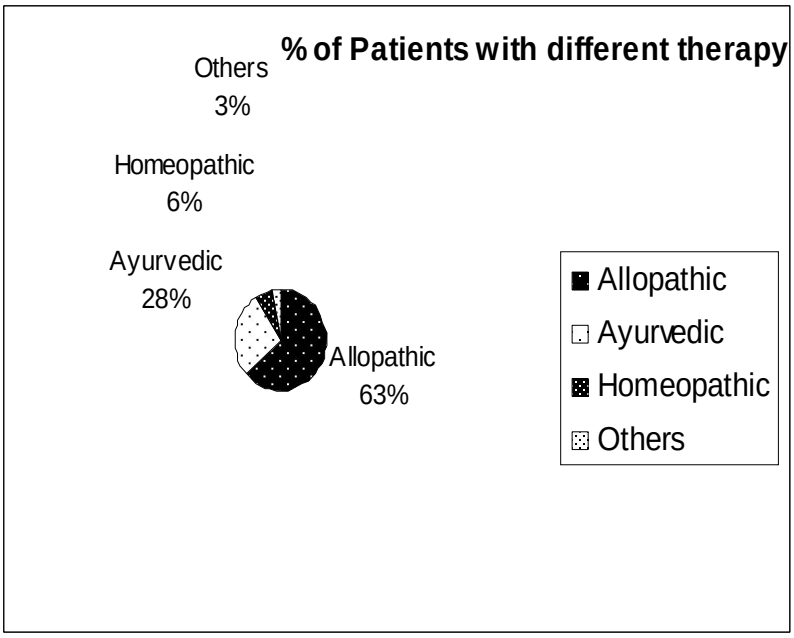


Figure 6: Different Therapy for stone



RESULTS AND DISCUSSION

Demographic data revels that prevalence of renal stone was found to be 72 % in men and 28 % in females. Furthermore, the prevalence ratio (male: female) for Kidney

stone was 2.57:1 and for gall stone thee ratio was 1:10. Prevalence of Kidney stone is significantly higher in urban area than in rural area. The reason for the high prevalence in men (1) May be due to high content of fluoride in different area of Gujarat, as it comes under stone belt area. [8] (2) May be due to high muscle content & muscular activity [9] The reasons behind stone in rural area is lack of purified water for drinking, Lack of knowledge for prophylactic awareness or preventive measures i.e. Drinking mineral water, keep your self hydrating, not knowing nature of stone for future reference. Improper diagnosis and for that of urban area is high obesity and less movement, with bad sitting, drinking soft drinks. [10]

Prevalence for men patient was observed more in 30-40 groups. However nearly similar incidence were observed in 40-50 and 20-30 age group also. That shows that working men are more prone to kidney stone probably due to high activity and improper water drinking habit. However now a day incidence of stone is increasing younger age group also as per physician comment. Same results were obtained for females also. But, female were found more prone to gall stone as compare to male probably due to racial reason.

There are a number of kidney stone symptoms which can occur, but pain and discomfort is the primary one that most people report along with UTI. The pain can be moderate or severe depending on the size of the stone among other things. Back pain radiating toward groin is believed gold standard symptoms for stone. It is often compared to the pain associated with childbirth for women. Nausea and vomiting was also noted in stone patients. Few patients were also found asymptomatic with no major symptom.

Suffering for most Kidney stone patients since long time indicating its chronic nature. The usage of Allopathic medicine for the treatment for Kidney stone is highest as compared to other therapies. Reason (1) May due to faster action as in case of radiating pain. (2) Specific action ex. Tamsulosin (α1b and α1d blocker) was commonly used to dilate stone for expulsive therapy. α1d receptor were predominantly found in Ureter and most concentrated in the distal Ureter. [11] However there is no prophylactic treatment available to prevent kidney stone as far as allopathic treatment is concerned. Ayurvedic drugs were becoming potential therapy for renal stone both preventive and curative ends.

Family history for KUB stone patients was found 62 % indicating hereditary factor for diseases. [12]

Hence awareness of Kidney stone patients for pharmacological as well as non pharmacological treatment, Lithotripsy, ESWL, surgery is becoming key task. Very few kidney stone patients were undergone for the diagnostic tests like Biochemical test or stone analysis due to lack of awareness but after diagnosis of kidney stone, the patients were found more conscious for the regular checkup and treatment.

CONCLUSION

So it is reasonable to conclude that Kidney stone prevalence is higher in men with age group 30-40 years. Female were found more prone towards gall stone both. UTI, nausea and vomiting were found most commonly, which are responsible for high morbidity in the patients. Improper water drinking habit, increased soft drink usefulness and lack of knowledge for stone analysis were found probable causes for stone. Majority of patients were prescribed antacid with antibiotics for UTI treatment. So proper awareness and proper combination of drug therapy are necessary for the better treatment of renal stone. In addition patients should also counsel for the probable cause stone as for stone prevention is better than cure.

REFERENCES

1. Collins CE, Chapter 14: The Urinary System, 2006; in Collins pp. 208-25.
2. Adriano R, Vitale C, Marangella M. Epidemiology of nephrolithiasis. J Nephro. 2000; 13: S65-70.
3. Van Aswegen CH, Du Plessis DJ. Pathogenesis of kidney stones. Med Hypotheses 1991; 36:368-70.
4. Fredric L.C, Andrew E, and Elaine W ; Kidney stone disease; The Journal of Clinical Investigation, October 2005; Volume 115, Number 10.
5. Anatomical alterations in patients with nephrolithiasis, J Bras Nefrol. Mar 2010; 32 (1): 33-6.
6. Pearle MS, Calhoun EA and Curhan GC, Chapter 8: Urolithiasis, 2007; in Litwin and Saigal, pp. 283-319
7. McNutt WF, Chapter VII: Vesical Calculi (Cysto-lithiasis), 1893; in McNutt pp. 185-6

8. http://www.dilipraja.com/stone.htm
9. http://www.essortment.com/urinary-system-disorders-47972.html
10. http://www.drhoffman.com/page.cfm/552.
11. Bijarania R. K., kaur T., Surinder K. Singla, Tandon C., Non surgical management therapies for kidney stone; J Pharm Edu Res June 2010; Vol1,Issue no. 1.
12. University of Maryland Medicine: Kidney Stones. http://www.umm.edu/patiented/doc81 full.html. 2003.

For Correspondence:
Amit S.Vyas
Email: amit_apmc@yahoo.co.in