

RESEARCH ON AWARENESS AND PREVENTION, IDENTIFY NEW SYMPTOMS, NATURAL REMEDIES, TREATMENT, LIFE STYLE CHANGES, RISK FACTORS, OF KIDNEY STONES(RENAL CALCULI) BY INVOLVING ROLE AND PATIENT COUNCELLING OF DOCTOR OF PHARMACY

RACHARLA JYOTHSNA*¹, MYLE AKSHAY KIRAN², MOHAMMAD MUSTAQ³, DR. GANGADHAR RAO⁴ and DR. ASHOK KUMAR⁵

*¹DOCTOR OF PHARMACY 4TH YEAR, PRATISTA INSTUTE OF PHARMACEUTICAL SCIENCE, DURJPALLY, CHEVMALA MANDALAM SURYAPETA TELANGANA STATE INDIA 508213

²DOCTOR OF PHARMACY, INTERNATIONAL RESEARCH SCHOLAR, , PRATISTA INSTUTE OF PHARMACEUTICAL SCIENCE DURJPALLY CHEVMALA MANDALAM SURYAPETA TELANGANA STATE INDIA 508213.

³M.PHARMACY(pharmaceutics)

⁴MBBS, FCID, DCH, CONSULTANT PEDIATRICIANVIJAYA, VIJAYA KRISHNA NURSING HOME, SURYAPETA

⁵M.PHARMACY, PHD PRINCIPAL INSTITUTE OF PHARMACEUTICAL SCIENCE DURJPALLY CHEVMALA MANDALAM SURYAPETA TELANGANA

Corresponding Author- MOHAMMAD MUSTAQ, DR. GANGADHAR RAO and DR. ASHOK KUMAR

Keywords:

Kidney stones, Pharmacy etc

Abstract

Kidney stones are one of the most common urological problems.(they undergo 12% MEN are more likely than women (6%) to develop kidney stones and the first incidence of stones usually occurs between 20-40 years of age. .Calcium is used for kidney failure used taking calcium carbonate or calcium acetate by mouth is effective for controlling high phosphate levels in the blood in people with kidney failure, calcium citrate is not effective for treating this condition. .Lemon -not having enough citrate in the urine seems to be increases the risk of developing kidney stones. There is 95%evidence that drinking. 2litres of lemonade throughout a day signecantly decrease the citrate levels in the urine. soy =kidney diseases in the people with diabetes, soy ,iso flavons might help prevent or heat kidney diseases in people with diabetes. stone root(herb) it is used in kidney stones and urinary tract infections. Suppose if patient took high doses of stone root drug, it undergo side effects ie dizziness, nausea, painful, stomach irritation..turmeric -it is inflammation (lupus erythrmatous), advance research suggest that taking turmeric daily for 3months can reduce blood pressure and improve kidney inflammation. So Suppose if patient took high doses of turmeric drug, it undergo side effects ie nausea, dizziness, diarrhea. significant risk reasons are 1.Lack of patient counseling.2.Lack of medication adherence.3.Lack of awareness regarding antibiotic réistance.4.No rational use of drugs. 5.prescription of high power antibiotics.6.Maintenance of unhygienic condition.The best way of preventing kidney stones is to make sure to drink plenty of

water each day to avoid becoming dehydration.. 1.Reducing salt intake2.Maintain a healthy diet3.Avoid fructose containing soft drinks4.Patient dietary calcium intake 700-1000mg per day.5.For patient urate stones reduce dietary purine rich protein like red meat,sea food,fish,animal protein.6.For patient calcium stones reducing eating oxalate rich food like potato chips, pear nuts,chocolate,beets,spinach.. This case reported here is such an example which again proves the importance of individualization and thus efficacy kidney stones can be very painful as you we'll know developing deposition of minerals and acid salts, oxalate, ureate, cystine phosphates, on the surface of the kidney stick, tougher and solidify, forming stone that can be as small as a grain of sand as large as golf ball, while simple life style changes and natural medication may help prevent kidney stone forming .

I. INTRODUCTION

Kidney stones are one of the most common urological problems. [1] Urinary calculi have worldwide distribution but are particularly common . It is estimated that approximately 2% of the population experiences renal stone disease at sometime in their life with male – female ratio of 2:1. The peak incidence is observed in 2nd to 3rd decade of life.[2] Calcium salts, uric acid, cystine and struvite are the basic constituents of most kidney stones. Calcium stones (75 – 80 %) are more common in men and approximately 50% of people who form a single calcium stone eventually form another within next ten years. Uric acid stones account for 5 – 10% of kidney stones and are also more common in men. Half of the patients with uric acid stones have gout and usually familial in origin. Struvite stones account 5 – 10% of all stones and are potentially dangerous. This stones occur mainly in women and as a result of urinary tract infection.oxalate monohydrate stones predominate in India.

11, HOW KIDNEY STONES TO DECREASE AND DEVELOPMENT , EPIDEMIOLOGY OF , PARTICULAR DISEASES OF VARIOUS PATIENTS, MONITORING, IMPORTANCE, LIFE STYLE CHANGES.

A.DEVELOPMENT

The development of urinary calculi or kidney stones is known as urolithiasis or nephrolithiasis. It is considered one of the most painful conditions known to man . . Over the last few years the incidence of kidney stones has increased and the age of onset for this condition has decreased. Diet and lifestyle may prevent the kidney stone diseases.

B.EPIDEMIOLOGY

To develop kidney stones and the first incidence of stones usually occurs between 20-40 years of age. The earlier the onset of the first episode, the more likely a person will be a multiple stone former. Increased body mass (obesity) is also a significant risk factor for developing renal stones. There are 5 primary types of stones. The most common are calcium oxalate or calcium phosphate stones and they account for 80-85% of all stones

C.IMPORTANCE

The loss of fluids and bicarbonate causes increased uric acid precipitation. Other causes include lead poisoning, long-term fasting, binge drinking, diabetes and insulin resistance. Uric acid stones can often be dissolved by alkalinizing the urine (citrate or sodium bicarbonate is used), along with increased water consumption. The drug Allopurinol is also used to reduce uric acid excretion via the kidneys. Struvite stones are caused by chronic urinary tract infections which elevate urinary pH, which allows for bacteria growth. Certain bacteria known as urea-splitting bacteria (Klebsiella, Pseudomonas and Proteus) are the primary pathogens responsible for this type of urinary stone. Certain structural or functional abnormalities of the urinary tract can also promote the formation of struvite stones,

including diverticuli, strictures of the bladder and neurogenic bladder. Women are more likely to develop this type of stone than men, and they can be very large. Cystine stones are relatively uncommon, they are caused by a rare genetic abnormality known as cystinuria. This condition causes large amounts of the amino acid cystine to be excreted and the onset of this type of stone often occurs in childhood or the early teen years. This type of stone can sometimes be dissolved and future stones prevented by drinking copious amounts of water (minimum 4 liters per day, ideally 5-7 liters per day).

II. New Symptoms

Severe pain in the back, below the ribs, and also unable to sit and stand and walk more time, pain that spreads to the lower abdomen and groin. Pain in urination, pink red and brown urine, cloudy (foul smelling urine)

The symptoms of kidney stones can range from asymptomatic to mild urinary frequency and discomfort to severe colicky pain in the abdomen, groin, and lower back. When stones are passing through the ureter it can cause hematuria, severe pain, nausea, vomiting, diarrhea, sweating and tachycardia. In severe cases kidney stones can cause urinary obstruction, kidney infections, and scarring and damage to the kidneys.

III. WHEN A PATIENT SUFFERING WITH KIDNEY STONES DISEASE, WHAT ARE THE PROBLEMS ARISING AND BY INVOLVING DOCTOR OF PHARMACY AND INVOLVING IN PATIENTS COUNSELLING From 2015 January —2016. December.

A. ATYPICAL HISTORY OF UTERIC STONE CASE HISTORY

1. A PERSON SUFFERING WITH 20 years OLD, FEMALE, Few twinges over 11 months with pain at flank region., UTI was observed 4 times before the kidney stones., Ultra sound scanning showed renal calculi 4mm diameter in right kidney with mild nephrosis., After the kidney stone, Again reoccurrence of urinary tract infection was observed. Then pharmacist observing and monitoring the patients.

A. Material and reasons and observance of pharmacist.

Patient is admitted with severe flank pain, frequent urination, pain during urination. UTI was identified and micro-organism was E-COLI antibiotics are prescribed. Patient is admitted with same symptoms again to the hospital with UTI INFECTION..

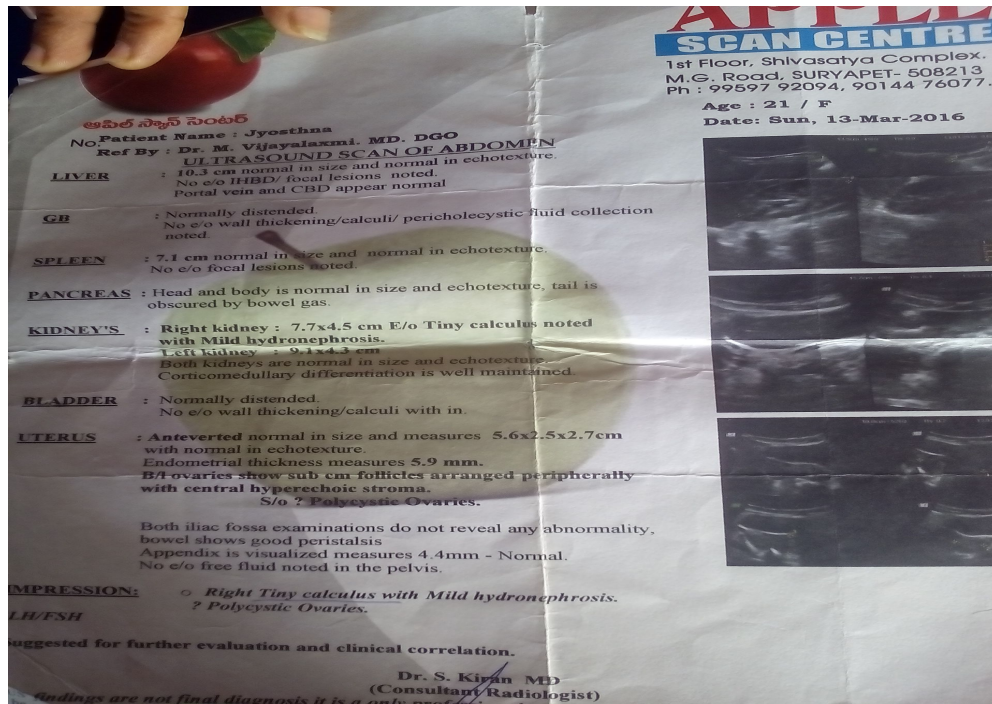
A: Reason: Incomplete course of tablets, Inadequate water intake.

B: Due to lack of counseling, no awareness in use of antibiotics by pharmacist.

ON 22-01-15.

B. SYMPTOMS :The patient admitted with severe flank pain, abdominal pain, headache, nausea, haematuria.

C. By Diagnosis: Right renal calculi with mild hydronephrosis is found.



D. TREATMENT TO PATIENT

Increased eosinophilis, UTI, organism ECOLI, - Ceftriaxone 500mg, DOLO650 MG, Voveran , pantac, monocef are drugs administered on 1st admissions.

Further on 2and admissions, mild nephrosis, cystitis is identified, - Ceftriaxone 500mg, dolo 650mg, pantac, Azithromycin, Voveran drug are given.

3 rd admission, increase in eosinophils, then drugs are given like ofloxacin, Ceftriaxone, dolo, pantac, etc

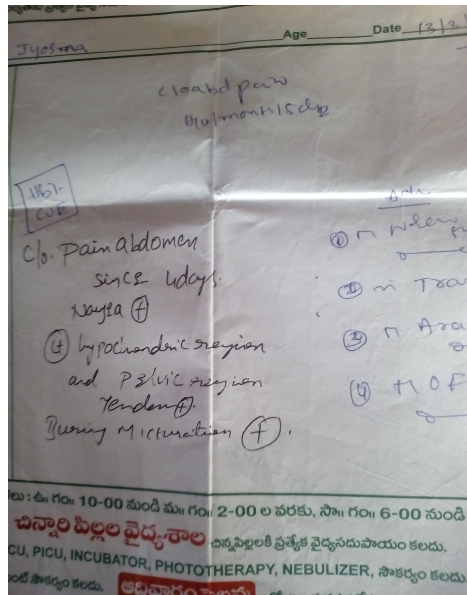
INVESTIGATIONS	RESULTS	UNITS	NORMAL RANGE
HEMATOLOGY			
HB%	9.9	gms%	11.5-14.0
PATHOLOGY			
COMPLETE URINE EXAMINATION			
PHYSICAL EXAMINATION			
QUANTITY	20 ml		
COLOR	REDTISH		
APPEARANCE	TURBID		
REACTION	ACIDIC		
SP. GRAVITY	1.025		
CHEMICAL EXAMINATION			
ALBUMIN	TRACE		
GLUCOSE	NIL		
BILE SALTS	ABSENT		
BILE PIGMENTS	ABSENT		
MICROSCOPIC EXAMINATION			
RBC	02 - 03 /HPF		
WBC	01 - 02 /HPF		
EPITHELIAL CELLS	PLENTY		
CRYSTALS	NIL		
CASTS	NIL		
OTHERS	NIL		

NOTE: THE ABOVE INVESTIGATIONS ONLY MEANT FOR CLINICAL CORRELATION. LIABILITY ONLY UP TO REPETITION IF REQUIRED. NOT VALID FOR ANY TYPE OF JUDICIARY PURPOSE.

Signature of M. S. Kiran

E. New brand names of drugs

PANTAP, MEROPENEM, CHYMORAL FOLATE, CALCIUM GLUCANATE, TRAMADOL, MEROTROL,



A. PATIENT CAME WITH ABDOMEN PAIN IN RIGHT SIDE AND PAIN IN URINATION, BURNING, MICTURATION, WE CARRY OUT SOME LABORATORY TESTS LIKE URINE TESTS, THEN AFTER ULTRA SOUND SCANNING %HAEMOGLOBIN AND COMPLETE URINE EXAMINATION, FOLLOWED BY ULTRA SOUND SCANNING, REPORTS SHOW FOLLOWING ABNORMALITIES LIKE LESS HAEMOGLOBIN (ANAEMIA), COLOUR REDDISH, APPEARANCE, - TURBID, FOUND INADVANCE RESEARCH TECHNOLOGY, IN ULTRASOUND SCANNING - RIGHT TINY CALCUS.

IV. Person is suffering with kidney stones since 6months then UTI was observed 4 times before the kidney stones., Ultra sound scanning showed renal calculi 4mm diameter in right kidney with mild nephrosis., After the kidney stone, Again so what are improvements to do

Material and reasons and observance by the pharmacist

A. ON FIRST ADMISSION

Right renal calculi with mild hydro nephrosis is found, URIKIND, DOLO 650, PANTAC, VOVERAN, MONOCEF, AMOXICILLIN, ciprofloxacin etc

B. 2nd admission

Cystitis is observed then advice the drug to be taken like NITROFUNTOIN, PANTAC, DOLO 650, MONOCEF, AMOXICILLIN,

C. 3rd admission

Mild hydronephrosis cystitis is observed. Drugs are given by physician like Amoxicillin with clavonic acid, dolo 650 mg, pantac, monocef, Voveran etc

V. REASONS OF PATIENTS REOCCURENCE.

- 1.Lack of patient counseling.
- 2.Lack of medication adherence.
- 3.Lack of awareness regarding antibiotic réistance.
- 4.No rational use of drugs.
- 5.prescription of high power antibiotics.
- 6.Maintenance of unhygienic condition.

V. PATIENT COUNCELLING FOR RENAL CALUCULI PATIENTS.

1. In prevention of disease
- 2.Counseling patients on discharge
- 3.Regarding non-pharmacological therapy
- 4.Drugs to be avoided
- 5.Foods to be avoided
- 6.Life style modifications.

VI. NATURAL REMEDIES OF KIDNEY STONES

- 1.Calcium - kidney failure used taking calcium carbonate or calcium acetate by mouth is effective for controlling high phosphate levels in the blood in people with kidney failure, calcium citrate is not effective for treating this condition.
 - 2.Lemon -not having enough citrate in the urine seems to be increases the risk of developing kidney stones. There is 95%evidence that drinking. 2litres of lemonade throughout a day signecantly decrease the citrate levels in the urine.
 - 3.soy =kidney diseases in the people with diabetes, soy iso flavons might help prevent or heat kidney diseases in people with diabetes.
 - 4.stone root(herb) it is used in kidney stones and urinary tract infections.
- Suppose if patient took high doses of stone root drug, it undergo side effects ie dizziness, nausea, painful, stomach irritation.
- 4.turmeric -it is inflammation (lupus erythrmatus), advance research suggest that taking turmeric daily for 3months can reduce blood pressure and improve kidney inflammation.
- So Suppose if patient took high doses of turmeric drug, it undergo side effects ie nausea, dizziness, diarrhea.

Home Remedies for Kidney Stones



Drink plenty of coconut and barley water regularly.



Avoid eating meat products, poultry and fish.



Have fresh ripe apples, melons and grapes.



Avoid foods with vitamin D, antacids and calcium base.

LIFE STYLE CHANGES

Diet (oxalate and phosphate consumption and excess sodium) may play a role in forming calcium stones, but lack of fluids and underlying metabolic problems such as hypercalciuria (excess urinary calcium), hyperoxaluria (excess urinary oxalate), and hypocitraturia (lack of urinary citrate) are most likely the primary causes. Uric acid stones are usually formed in people with gout or gouty arthritis. They can also form in patients with chronic diarrhea caused by Crohn's Disease and ulcerative colitis



Magnesium – men who consumed higher levels of dietary or supplemental magnesium had reduced risk of developing kidney stones. Magnesium decreases oxalate absorption and urinary excretion. Potassium citrate – oral potassium citrate supplementation has been shown to help prevent kidney stone formation. Recent studies also found that epileptic. Vitamin C – high levels of vitamin C (1,000 mg per day), was associated with a greater risk of developing kidney stones than in men who took low levels of vitamin C. Vitamin D – High doses of this important vitamin have been linked to increased formation of calcium kidney stones in people with hyper-parathyroidism. Vitamin K – people with higher amounts of vitamin K have a lower incidence of kidney stones. Vitamin K was found to inhibit calcium oxalate formation. In a human study this herb was found to reduce urinary calcium levels in patients with. It also slowed the growth of already existing stones.

Easy Ayurvedic Treatment for Kidney Stones removal



1. PHARMACIST SHOULD PROVIDE INFORMATION ON NON PHARMACOLOGICAL THERAPY

Foods to be avoided:, Potato chips, peanuts chocolate spinach, Asparagus, Beetroot,Rhubarb,Chocolate,BerriesLeeks,Parsley,CeleryAlmonds,Peanuts,, Cashew nut, Soy products, Grains such as oat meal, Whole wheat., Plenty of water intake, Decreased salt intake, Maintain healthy diet, Avoiding fructose containing soft drinks Avoid calcium containing food: Meat, Poultry, fish..

VII.NEW Preventive measures to be counseling by pharmacist TO patient

The best way of preventing kidney stones is to make sure to drink plenty of water each day to avoid becoming dehydration.

- 1.Reducing salt intake
- 2.Maintain a healthy diet
- 3.Avoid fructose containing soft drinks
- 4.Patient dietary calcium intake 700-1000mg per day.
- 5.For patient urate stones reduce dietary purine rich protein like red meat,sea food,fish,animal protein.
- 6.For patient calcium stones reducing eating oxalate rich food like potato chips, pear nuts,chocolate,beets,spinach.
- 7.To maintaining healthy exercise.
- 8.Awareness about the kidney stone formation to the people

VIII. RISK FACTORS

Family history, consuming high protein, high sugar content, high sodium, other medical conditions like renal tubular acidosis, cystinuria, uti,

Age , Twice in men than women, Men after age 40, Women during 50, Tinge girls have higher risks, Inadequate fluid intake and urine output promote urine concentration, Eating habits, Emotional status, Exercise, Pulmonary ventilation, Dietary habits

IX. PATIENTS ARISING QUESTIONS ABOUT THE PROBLEM OF RENEL CALUCULI INVOLVING PHARMACIST.

1. Which stones are most likely to pass with out surgery

Smaller the stone and the more distal its location the more likely it will pass spontaneously. If the stone size 2-4mm in diameter to pass in approximately 13days.. If the stone size 6-8mm in diameter to pass in approximately 22days.

- 2.Why kidney stones can be problem?

Stones pass from the kidney to the ureters., ureter is small and delicate stone may be to large to pass smoothly the ureter can cause spasms and irritation. Which causes blood in urine some times stones block the flow of urine leads to kidney damage..

X. PHARMACIST IS AN A IDEAL POSITION

- 1.Pharmacist should advise in present to stop use of ceftriaxone

2. The patient should be well counseled about preventive measures to prevent reoccurrence of UTI and Kidney stones.
3. Counseling about non pharmacological therapy
4. Importance of medication adherence
5. Creating awareness about Antibiotic resistance
6. Counseling about Drug Information and their usage along with drug.

X. A man of moderate built, tall aged 34 years, by profession a lawyer attended the clinic with recurrent attack of mild to moderate dull aching, burning pain in right side of abdomen (right hypochondria) & back (lumber region) for last 1½ months. The pain aggravates on motion and ameliorates on rest. Complaint has started gradually and it may be due to stone(s) in right kidney. No other specific complaints and no treatment adopted previously. USG of whole abdomen was advised which shows a calculus of 12 mm sized in middle calyx of right kidney.

A. Material and reasons and observance by the pharmacist

Personal history- Married, has one boy child; has good relation with family members. No specific addictions elicited.

Family history- Nothing contributory history found.

Physical general- He has good appetite, desire for spicy food & extra salt. He drinks less water with regular bowel movement. Tongue moist & clean, passes urine 5 – 7 times daily. Perspiration is moderate, more on face. Skin is dry, healthy. A late night sleeper, often after midnight has profound sleep mostly in the morning hours with frequent dreams of cats. Patient is hot and loves rainy season.

Mental symptoms- Patient is hard working, gentle, co-operative, desires company and loves to travel. He has fear of ghost and very much difficult to sleep alone at night.

On systematic and local examination- No specific abnormalities found. BP & pulse were recorded 110/80 mm of Hg and 74/min respectively.

- As patient had no previous reports, so USG of whole abdomen was advised on 07-12-2014. Patient came with USG report on 14-12-2014, which showing a calculus of 12 mm in middle calyx of right kidney. The whole case was re-perforated and after consulting materia medica phosphorous, 6 doses for 3 days was prescribed.



Lady's Finger For Kidney Stones

B. Risk factor for kidney stones;

Greatest risk factor for kidney stone is making less than 1litter water of per day

Intake of water less than 5litter per day

Abnormal uti

Hyper para thyroidism

Exposure to hot environment like hot working condition

Gastric bypass surgery

Obesity

Inflammatory bowel disease ;increase the ca absorption

Urine ph promote <5.5 leads to uric acid crystals form

Taking medicines like ca based anti acids and diuretics

XI. DOCTOR OF PHARMACY INVOLVING AND COUNSELING TO THE PATIENT'S

How much fluid should patient drink

In general patient should take sufficient water fluid. Reduced the risk of akd especially they are taking nsoids . Advice patient to maintain as lightly colored urine. Patient who are dehydrate: benefit for iv fluids. Sometimes once ureter has become obstructed excessive fluid intake will increase urine out put pressure causing

XII. NEW PREVENTION OF KIDNEY STONES

Liquids

The single most important thing kidney stones sufferers can do to prevent future stones is to increase water consumption enough so that the person excretes at least 2 quarts of urine per day (approximately 10 glasses of fluids per day). Water is more effective than many other fluids and it is generally recommended that no more than one or two 8 oz. servings of colas be consumed daily (cola beverages reduced urinary citrate levels and most contain phosphoric acid which promotes stone formation). Orange juice and pomegranate juice have also been shown to be effective in preventing stone formation. Fresh tomato juice (freshly juiced with no added salt) was found to be a rich source of citrate and magnesium, while being low in sodium. It is believed freshly made tomato juice will also inhibit stone formation Research also indicates lemon juice (about ½ cup per day) helps to prevent kidney stone formation. Grapefruit and apple juices actually increased risk of stone formation (one 8 oz. glass per day increased stone formation by 39-44%). In human studies, three 8 oz. cans of soda per week increased stone formation by 15%. Cranberry juice and capsules increased oxalate levels in urine so should be avoided by people with calcium oxalate stones, but because it helps prevent UTI's it should be consumed by patients who form struvite stones. There are mixed studies on the benefits or risks associated with drinking coffee, tea, caffeinated beverages and wine or beer. Some sources say beer should be avoided for people with uric acid stones (it is high in purines). Other sources say black tea (high in oxalates) and caffeinated beverages should be avoided.

Diet

According to numerous studies, increasing daily fluid intake and reducing salt are probably the 2 most important preventative measures for stone producers. The role of animal protein and calcium in the diet and stone formation is not entirely clear. While lowering animal protein and salt decreased stone formation, changing the diet from animal to vegetable protein had no discernable preventative effect.



Foods & Herbs, High in Oxalates (* very high), Foods & Herbs with Moderate Oxalate Levels beets *, Beet greens, Amaranth, Cocoa powder, Spinach*, Almonds, Dandelion greens, Sweet Potatoes, Buckwheat*, Sesame Seeds, Green Beans, Oranges, Green Peppers, Chocolate, Black tea, Peanuts, Cinnamon, Turmeric, Apples, Carrots, PotatoesCashew nuts (raw).



XIII. CONCLUSION

WE TREAT THE PATIENTS WITH THE FOLLOWING MEDICATION EVEN THOUGH WE DOES NOT GET SUCCESSFUL OUT COMES, SO SUGGESTED NATURAL REMEDIES LIKE BY USING THESE REMEDIES SHOWN BETTER RESULTS COMPARE TO THE PHARMACOLOGY TREATMENT SO MY SUGGESTION AND WE UNDER GO AND DID RESEARCH ON NATURAL REMEDIES BY INVOLVING, PHYSICIAN, AND CLINICAL PHARMACIST ADVISED AND MONITERED, GIVEN A WERNESS ON THOSE WHO ARE SUFFERING WITH KIDNEY STONES (RENELCALCULI).

REFERENCES

1. *WWW.pharmacytimes.com>article*
2. *https://xa.yimg.com>issue>kidney*
3. *https://WWW.peoplespharmacy.com>can*
4. *WWW.nhs.uk>choosing a pharmacy remedy*
5. *Health.CVS.com.Getcontent*
6. *WWW.the health site . Com*
7. *Aggarwal, A., Tandon, S., et al, Diminution of Oxalate Induced Renal Tubular Epithelial Cell Injury and Inhibition of Calcium Oxalate Crystallization In Vitro by Aqueous Extract of Tribulus terrestris, International Braz J Urol, 2010;36(4):480-489*
8. *Al-Awadi, K.A., Kehinde, E.O., et al, Treatment of Renal Calculi by Lithotripsy: Minimizing Short-Term Shock Waves Induced Renal Damage by Using Antioxidants, Urol Res, 2008;36(1):51-60*
9. *Anderson, R.A., A Complementary Approach to Urolithiasis Prevention, World J Urol, 2002; 20(5):294-301*
10. *Aros, B., Kalfazade, N., et al, Can Lemon Juice Be An Alternative to Potassium Citrate in the Treatment of Urinary Calcium Stones in Patients With Hypocitraturia? A Prospective Randomized Study, Urol Res, 2008; 36:313-317*
11. *Atmani, F., Slimani, Y., et al, Effect of Aqueous Extract From Herniaria hirsuta L. on Experimentally Nephrolithiasic Rats J Ethnopharmacol, 2004;95(1):87-9*
12. *Barros, M., Lima, R., et al, Effect of Extract of Phyllanthus nirurion Crystal Deposition in Experimental Urolithiasis, Urol Res, 2006;34:51-357*
13. *Basavaraj, D.R., Biyani, C.S., et al, The Role of Urinary Kidney Stone Inhibitors and Promoters in The Pathogenesis of Calcium Containing Renal Stones, European Assoc Urol, 2007;5: 126-136*
14. *Bashir, S., Gilani, A.H., et al, Berberis vulgaris Root Bark Extract Prevents Hyperoxaluria Induced Urolithiasis in Rats, Phytother Res, 2004;1250-55*
15. *Bennett, S., Hoffman, N., et al, Ephedrine-and Guaiifensin-Induced Nephrolithiasis, J Altern Complement Med, 2004;10(6):967-9*
16. *of Urolithiasis: Alternative or Complementary?, Planta Med, 2009;75:1095-1103*
17. *Cao, Z.G., Liu, J.H., et al, An Experimental Study of Effect of Different Extracts of Alisma orientalis on Urinary Calcium Oxalate Stones Formation in Rats [In Chinese], Zhongguo Zhong Yao Za Zi, 2003;28(11):1072-5*
18. *Chauhan, C.K., Growth Inhibition of Struvite Crystals in The Presence of Herbal Extract Boerhaavia diffusa Linn, Am J Infect Dis, 2009;5(3):170-179*
19. *Chen, X-F., Sheng, B.W., et al, Protective Effects of Salvia miltiorrhiza and Verapamil on High Energy Shock Wave Induced Renal Damage in Rabbits, J 4th Mil Med Univ,*

2004

16. Chou-Huang, T., Yu-Cheng, C., et al, *A Traditional Herbal Antilithic Formula, Wulingsan, Effectively Prevents the Renal Deposition of Calcium Oxalate Crystal in Ethylene Glycol-Fed Rats*, *Urol Res*, 2008;36:17-24
17. Christina, A.J., Ashok, K., et al, *Antilithiatic Effect of Asparagus racemosus Willd on Ethylene Glycol-Induced Lithiasis in Male Albino Wistar Rats*, *Methods Find Exp Clin Pharmacol*, 2005;27(9):633-8
18. Colella, J., Kochis, E., et al, *Urolithiasis/Nephrolithiasis: What's It All About?*, *Urol Nurs.*, 2006; 25(6):427-448, Curhan, G.C., Willett, W.C., et al, *Prospective Study of Beverage Use and the Risk of Kidney Stones*, *Am J Epidemiol*, 1996;143(3):240-7
19. Curhan, G.C., Willett, W.C., et al, *Dietary Factors and The Risk of Incident Kidney Stones in Younger Women: Nurses' Health Study II*, *Arch Intern Med.*, 2004;164(8):885-91
Daudon, M., Jugers, P., *Drug-Induced Renal Calculi: Epidemiology, Prevention and Management*, *Drugs*, 2004;64(3):245-75
20. Fiore, K., *Supplement Averts Kidney Stones in Ketogenic Diet*, *MedPage Today*, 2009
21. Frietas, A.M., Schor, N., et al, *The Effect of Phyllanthus niruri on Urinary Inhibitors of Calcium Oxalate Crystallization and Other Factors Associated With Renal Stone Formation*, *BJ. Int*, 2002;89(9):829-34
22. Grases, F., Masarova, L., et al, *Effect of "Rosa canina" Infusion and Magnesium on The Urinary Risk Factors of Calcium Oxalate Urolithiasis*, *Planta Med*, 1992;58(6):509-12
Grases, F., Prieto, R.M., et al, *Phytotherapy and Renal Stones: The Role of Antioxidants. A Pilot Study in Wistar Rats*, *Urol Res.*, 2009;37(1):35-40
23. Hadizadeh, M.A., Khoei, A., et al, *Ethanol Extract of Nigella sativa L. Seeds on Glycol-Induced Kidney Calculi in Rats* *Urol J.*, 2007;4(2):86-90
24. Hall, P.M., *Nephrolithiasis: Treatment, Causes and Prevention*, *Cleve Clin J Med*, 2009;76(10):583-91
Hirayama, H., Wang, Z, et al, *Effect of Desmodium styracifolium-Triterpenoid on Calcium Oxalate Renal Stones*, *Br J Urol*, 1993;71(2):143-7
25. Huang, H.S., Chen, J.K, et al, *Vitamin E Attenuates Crystal Formation in Rat Kidneys: Roles of Renal Tubular Cell Death and Crystallization Inhibitors*, *Kidney Int.*, 2006;70(4):699-710
26. Kieley, S., Dwivedi, R., et al, *Ayurvedic Medicine and Renal Calculi*, *J Endourol*, 2008;22(8):1613-6
Kober, A., Dobrovits, M., et al, *Local Active Warming: An Effective Treatment for Pain, Anxiety and Nausea Caused by Renal Colic*, *J Urol*, 2003;170(3):741-744
27. Laroubi, A., Touhami, M., et al, *Prophylaxis Effect of Trigonella foenum graecum L. Seeds on Renal Stone Formation in Rats*, *Phytotherapy Research*, 2007;21, 921-925
28. Marz, R., *Medical Nutrition From Marz*, *Omni Press, Portland, OR*, 2nd ed., 1999
Maclean, W., Lyttleton, J., *Clinical Handbook of Internal*
29. *Medicine, Un of Western Sydney Macarthur, Vol. I*, 1998
Muangman, V., Viseshsindh, V., et al, *The Usage of Andrographis paniculata Following Extracorporeal Shock Wave Lithotripsy (ESWL)*, *J Med Assoc Thai*, 1995;78(6):310-3
30. *National Kidney and Urologic Diseases Information Clearinghouse, Kidney Stones in Adults*, *NIH Pub. 08-2495*, 2007, retrieved from www.kidney.niddk.nih.gov
31. Nishiura, J.L., Campos, A.H., et al, *Phyllanthus niruri Normalizes Elevated Urinary Calcium Levels in Calcium Stone Forming (CSF) Patients*, *Urol Res*, 2004;32(5):362-6
Oxalic Acid and Foods, 2005, retrieved from <http://growingtaste.com/oxalicacid.shtml>.

-
32. Pragasam, V., Kalaiselvi, P., et al, Oral L-Arginine Supplementation
 33. Ameliorates Urinary Risk Factors and Kinetic Modulation of Tamm-Horsfall Glycoprotein in Experimental Hyperoxaluric Rats, *Clin Chim Acta*, 2005;360(1-2):141-5 Prasad, K.V.S.R.G., Sujatha, D. et al, Herbal Drugs in Urolithiasis-A Review, *Phcog Rev*, 2007;1(1):175-179 Prasongwatana, V., Woottisin, S., et al, Uricosuric Effect of Roselle (*Hibiscus sabdariffa*) in Normal and Renal-Stone Former Subjects, *J Ethnopharmacol*, 2008;117(3):491-5
 34. Rodgers, A., Lewandowski, S., et al, Evening Primrose Oil Supplementation Increases Citraturia and Decreases Other Urinary Risk Factors for Calcium Oxalate Urolithiasis, *J Urol*, 2009;182(6):2956-63
 35. Science News, Kidney Stones: Rating What You Drink, Vol. 149, 1996 Shao, S-F, et al, Protection Effect of Chinese Herbs Christina Loosestrife, Pyrrrosia and Plantago on Kidney Injury in
 36. the Model of Rat Calcium Oxalate Stones [In Chinese], *Zhejiang J Int Trad Chin & West Med*, 2009 Sheng, B.W., Chen, X.F., et al, *Astragalus membranaceus* Reduces Free Radical-Mediated Injury to Renal Tubules in Rabbits Receiving High-Energy Shock Waves, *Chin Med J(Engl)*, 2005;118(1):43-9 Sheng, B.W., Chen, X.F., et al, The Protective Effect of Chinese
 37. Herbs for Supplementing Shen to Eliminate Stone on Renal Injury Induced by Extracorporeal Shockwave Lithotripsy in Patients With Renal Calculus [In Chinese], *Zhongguo Zhong Xi yi Jie He Za Zhi*, 2008;28(8):694-7.
 38. Sheng, B.W., He, D., et al, The Protective Effects of The Traditional Chinese Herbs Against Renal Damage Induced by Extracorporeal Shock Wave Lithotripsy: A Clinical Study,
 39. *Urol Res*, 2011;39(27):89-97 Simon, H., MD [Ed.], What Dietary Factors and Lifestyle Measures Are Used For Prevention of Kidney Stones?, retrieved from University of Maryland Medical Center, www.umd.edu Siva, S., Barrack, E.R., et al, A Critical Analysis of The Role of Gut Oxalobacter formigenes in Oxalate Stone Disease, *BJU*.