



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Review Article

January 2020 Vol.:17, Issue:2

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A Short Review on: Prevention of Kidney Stone with Healthy Diet



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Submission: 25 December 2019

Accepted: 31 December 2019

Published: 30 January 2020



HUMAN JOURNALS

www.ijppr.humanjournals.com

Keywords: Urolithiasis, Crystal growth, medicinal plants, Vegetables

ABSTRACT

The nutritional diet, life style and herbal medicine are the natural remedy for all the disease. The type of nutrition and life style of human being is important factor in initiation of kidney stone. So control on diet and herbal medicine is the best management in prevention and control of urolithiasis it is cost effective and safest medicine from an ancient periods. Urolithiasis is a problem, where the calcium oxalate crystals are formed in the urinary tract. Hence it is necessary to know the mechanism of urolithiasis, i.e. is how stones are formed in urinary tract. The patient will come across various symptoms and diagnosis to find out the problem and get prescribed to some of allopathic medicines which are harmful to human system. The safest medicines than the allopathic medicines are Herbal system and here an attempt is made to review a some of phytoconstituents which are present in food and some herbs which helps for prevention of urolithiasis.

INTRODUCTION

Kidney stones are among the most common and painful disorders of the urinary tract, mainly the symptoms include abdominal and pelvic region pain, acidity, lack of appetite, painful micturition with complication of urinary tract infection also. Each year, thousands of Indians are suffered with kidney (renal) stone disease. About 10 percent of all Indians will diagnose with kidney stone disease during their lifetime but despite considerable research in medical science there is no satisfactory medical treatment for urolithiasis. The incidences of kidney stones are rising in rural and urban societies & frequency of kidney stone in men is high as compared to women.

Pathogenesis

This condition is develops when the kidney unable to excrete unwanted substances through urine that becomes overly saturated with certain microscopic minerals substances that is of calcium, phosphates and oxalates in the kidney they form crystals that eventually bind into hardened mineral deposits, known as calculi or stones¹. Crystalline Composition of Renal Calculi most common type of stone found is calcium oxalate either as monohydrate or dihydrate crystal form; about 60% calculi are pure calcium oxalate mixed calcium oxalate-calcium phosphate; about 10% pure calcium phosphate 9% struvite (infection stones of magnesium ammonium phosphate, also called triple phosphate stones) 5-10% uric acid stones 5 - 10% (variable depending on diet) miscellaneous stones 1-5% (cystine, rare metabolites, drugs etc.) analysis of stone to determine composition is critical aspect of management of patients with renal stones also contain approximately 2.5% organic material called stone matrix, the function of which has not been fully determined.

The reoccurrence of kidney stones is about 10% in men and nearly 5% in women over the age of thirty in the India². There are different types of urinary disorders; stone formation is common and important. The pathology of urolithiasis disease is related to food habits of individuals. It has been often stated that dietary oxalate contributes no more than 10 to 20% of the oxalate excreted in urine under normal conditions,³ recent work suggests that, even in the absence of gastrointestinal disorders, intestinal absorption of dietary oxalate can make a more significant contribution to urinary oxalate.⁴ Changes in urinary oxalate exert a greater influence on the risk of stone formation than do proportional changes in urinary Calcium. Crystal formation is a complex process involving nucleation, aggregation of micro-crystals, disaggregation, crystal

growth and dissolution, so stone formation occurs as a multi-step process which may be modified by inhibitors of crystal growth and aggregation, or by promoters of crystal growth or by complexors of the various ions in solution in urine. The kidney is an organ highly vulnerable to damage caused by reactive oxygen species (ROS), likely due to the abundance of polyunsaturated fatty acids in the composition of renal lipids. ROS are involved in the pathogenic mechanism of conditions such as glomerulosclerosis and tubulointerstitial fibrosis. Risk factors for kidney stones including family history of kidney stones, education level, obesity, hypertension, and urinary tract infection, use of analgesic drugs and cola consumption were identified from the literature⁵.

Clinical management

The optimal clinical management of this disease requires knowledge of the diagnostic procedures, the rational treatment of acute stone colic and the modern principles of stone removal. It is also essential to have a basic understanding of the etiological factors of stone formation and how a metabolic risk evaluation should be carried out in order to provide a sound basis for appropriate recurrence preventive measures. It was observed that the peoples of which dietary habits include a high intake of animal proteins and oxalates and a low intake of potassium containing citrus fruits and fluids may increase the risk of kidney stone⁶. Increasingly citrate preparations are being used for the prevention of recurrent calcium oxalate stones. The increase citrate results in a reduced excretion of calcium, and an increased excretion of the inhibitor and complexor – citrate. Inadequate water intake decreases total urinary volume therefore increasing the concentration of stone forming salts. Intake of sodium is also associated with increased risk of stone formation presumably because of increased urinary calcium excretion. The high non-vegetarian diet may be a reason of stones in the patients suffering with problems of uric acid and cystine stones. Consumption of groundwater may be one of the reasons of stone formation in patients⁷. The longer the groundwater is in contact with the minerals, the greater the extent of its reaction with those minerals and higher will be the content of dissolved minerals in it. Because running water remains static for lesser time than underground this may be a reason of less mineral content in its water.

Kidney stone formation or urolithiasis is a complex process that is a consequence of an imbalance between promoters and inhibitors in the kidney. Corn and wheat bran are rich in phytate (IP-6), which act as inhibitor of stone formation⁸. Grapes, Sapota and Amla are known as stone formers because these are rich of oxalates, these foods irritate the kidneys while Date,

Banana and Lemon are known as stone inhibitors as they are rich in B complex vitamins and citric acid⁹. Lemon juice as an alternative medicine to prevent urolithiasis¹⁰. Take banana, carrots, bitter guard and horse gram as they are rich in stone inhibitors. Take more citrus fruits such as Lemon, Orange and Kinnow to dissolve stones. Avoid foods rich in oxalates such as Spinach, Amaranth, Tomato, Amla, Sapota, Cashew nuts and Cucumber.

Avoid excessive use oxallic acid rich diet as well as heavy calcium rich diet of animal foods such as chicken, egg, fish and meat to prevent uric acid stone formation. Restrict Cauliflower, Brinjal and Pumpkin in diet as they form uric acid stones. The evidence of moderate consumption of red wine can be partly attributed to its antioxidant properties. This will help to enhance the kidney antioxidant defense system. In wine Polyphenols behave as potent ROS scavengers and metal chelators; ethanol in turn modulates the activity of antioxidant enzymes. Therefore, a hypothesis that red wine causes a decreased vulnerability of the kidney to the oxidative challenges could be proposed¹¹.

CONCLUSION

Currently, in the management of urinary stones surgical procedures and extra corporeal shock wave lithotripsy are commonly employed. The major drawback of these procedures is recurrence of stones. It is essential to know about the causes of developed kidney stones and there are different reasons for that. There are some potent medicinal plants traditionally used in the treatment of urolithiasis such as a relationship between the diet and the risk of urinary tract calculus formation can provide simple and more cost effective measure of prevention of stones in kidney stone patients. If proper counseling and guidance is provided to such patients at the right time regarding dietary management depending upon the stage of the disease and condition of the patient, it will help to prevent further complications of kidney.

Drink plenty of fluids (2-2.5 lit per day) such as coconut water, corn silk tea, Barley water and Pineapple juice to prevent stone formation, take Banana, Carrots, bitter guard and horse gram as they are rich in stone inhibitors. Take more citrus fruits such as, Lemon, Orange and Kinnow to dissolve stones. Take Vitamin B complex rich diet. Avoid foods such as dry fruits, oxalates such as Spinach, Amaranth, Tomato, Amla, Sapota, Cashew nuts and Cucumber. Avoid excessive use of animal foods such as chicken, egg, fish and meat to prevent uric acid stone formation. Restrict Cauliflower, Brinjal and Pumpkin in diet as they form uric acid stones. The

plant products and dietary restriction may not replace these procedures but may surely help in decreasing the recurrence rate of renal calculi.

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