



Review Article

## ORAL ADMINISTRATION OF *PANEeya KSHARA* (ALKALINE PREPARATIONS) AND ITS ROLE IN THE MANAGEMENT OF *MUTRASHMARI* (RENAL CALCULI)- A CRITICAL APPRAISAL

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### ABSTRACT

Renal calculi are defined as the crystalline mineral deposits that are formed in the kidney. It has a global prevalence 15%. These stones are formed when the urine becomes excessively supersaturated with respect to a mineral, leading to crystal formation, growth, aggregation and retention within the kidneys that develop in the urinary tract and are known as Nephrolithiasis or Urolithiasis. Though multiple and advanced treatments are available to treat the renal stones, complete relief and non recurrence is still not possible. In Ayurvedic science, renal stones or the urolithiasis can be correlated to *Mutrashmari*, which is said to be a disease of *Mutravaha srotas*. Though various types of treatments are available in the classics, the unique oral medication known as *Paneeya kshara* or the oral medication prepared out of alkaline substances is described by Acharya Susrutha in Sushrutha samhitha for the successful management of *Mutrashmari*. In Ayurveda, many types of *Paneeya kshara* have been found that has been described for the management of *Mutrashmari* and many studies has been conducted on the same. In the present study, an attempt has been made to review all such studies that have evaluated the different types of *Paneeya kshara* in the treatment of *Mutrashmari* were systematically reviewed to put the best possible inputs into this study so that it helps the future researcher in conducting further studies on the disease and the intervention.

### INTRODUCTION

Nephrolithiasis or the kidney stone disease, with a prevalence of 7% in the adults, and ≥30% recurrence rate has become a common problem worldwide. Globally the incidence of kidney stones is increasing with a 15% of estimated prevalence. Men are more prone with 13% and women with 7% lifetime prevalence.<sup>[1]</sup>

In U.S, the incidence is estimated at 600,000 in the age group of 20 to 49yrs.<sup>[2]</sup> About 12% of the Indian population are expected to have kidney stones and 50% among them end up in loss of kidney functions.<sup>[3]</sup> Age, gender, ethnic groups, local climate, dietary habits, physical activity and occupation etc. different risk factors and the co-morbidities such as diabetes, hypertension, and obesity also greatly contribute to the increasing prevalence.<sup>[4]</sup>

Kidney stones or the calculi are defined as the mineral concretions that are formed in the renal calyces and pelvis and attached to the renal papillae. These stones are formed when the urine becomes excessively supersaturated with respect to a mineral, leading to crystal formation, growth, aggregation and retention within the kidneys that develop in the urinary tract and are known as nephrolithiasis or urolithiasis.<sup>[5]</sup> Kidney stones are made up of both the

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organic and inorganic crystals which are amalgamated with proteins. Among the types of stones, calcium stones accounts for up to 80% and are the most common ones. This includes radio-opaque stones such as calcium oxalate, calcium phosphate, struvite and cystine and radiolucent stones like uric acid, xanthine, and hypoxanthine stones.<sup>[6]</sup> Based on the analysis of urine, urine culture, and imaging, the diagnosis of renal stones are made and the condition is assessed for stone removal if it is more than 10mm.<sup>[7]</sup>

In the medical management, kidney stones are treated with diet, therapies and medical expulsion therapy of stones.<sup>[6]</sup> In the dietary management, proper fluid intake and dietary changes play a very important role in the prevention of kidney stones. Many studies have shown that increasing the water intake and urine volume to at least 2 L/day or 2 lit/day can help in 40-50% of prevention of the recurrence of stone disease.<sup>[8]</sup> According to the American Urology Association Nephrolithiasis Clinical Guidelines, the medical expulsion therapies is the treatment that facilitates the spontaneous passage of ureteric calculi with combination of drugs and the stone fragments are generated by the shock wave lithotripsy which depends upon the degree of renal function deterioration and severity of the obstruction.<sup>[9]</sup>

Antispasmodics such as calcium channel blockers and alpha blockers are administered for stones measuring 10mm or less which relaxes the smooth muscle of the ureters and this have been shown to remove the stones by five to seven days.<sup>[9]</sup> Along with this, co-administration of oral corticosteroids has neither shown little nor improvement in clinical outcomes.<sup>[10]</sup> Most commonly used surgical procedures for stone removal are minimally invasive techniques such as shock wave lithotripsy (SWL), ureteroscopy (URS), and percutaneous nephrolithotomy (PNL). Laparoscopic, robot-assisted, and open surgeries are the other less commonly performed procedures.<sup>[12]</sup>

In Ayurvedic science, renal stones or the urolithiasis can be correlated to *Mutrashmari*, which is said to be a disease of *Mutravaha srotas*. Ayurveda has a vast description of management of *Mutrashmari* and recent studies have witnessed the same. In the present study, an attempt has been made to evaluate the effects of various Ayurvedic formulations that have been studied in the management of *Mutrashmari*.

### Renal stones/Kidney stones in Ayurveda

Acharya Sushruta has described in detail about the kidney stones and its management. Urolithiasis or *Mutrashmari* (urinary stone) in Ayurveda is said as one among the eight fatal disorders or the *Ashtamahagada* and one of the major and most

complicated diseases. Based on the clinical features, it can be correlated to urolithiasis or the renal calculi. It is one of the common diseases of *Mutravaha srotas* (urinary tract). As it is located in Marma and due to the involvement of *Basti*, one of the *Tri Marma* (three vital parts), it is difficult to cure.<sup>[13]</sup>

### Yava kshara

In one of the study, 10 patients with the complaints of *Mutrashmari* were selected from the SV Ayurvedic College, Tirupati, based on inclusion and exclusion criteria. They were administered *Yava kshara*, the *Paneeya kshara* in the dose of 250 mg once in a week for 4 weeks. Results showed that the *Yava kshara* (*Paneeya kshara*) was effective in reducing the symptoms and showed significant changes in the parameters of *Mutrashmari*.<sup>[12]</sup>

### Anandyoga paneeya Kshara

*Anandyoga kshara*, a type of *Paneeya Kshara* (oral alkali preparation) contains the ingredients such as sesamum indicum, achyranthus aspera, butea frondosa, musa sapientum and emblica officinale. In the study of Sonaje et al, total number of twenty patients was treated with *Anandyoga kshara* in extract form of 250mg capsule twice daily for 60 days with *Avimootra* as the *Anupana*. After completion of the treatment it was found that 14 patients were free from abdominal pain and dysurea in 16 of them, stones had reduced in their size considerably and 8 stones remained unchanged in their size.<sup>[14]</sup>

### Kalyana kshara

A 53 year old male patient presented with complains of radiating pain from loin to groin associated with burning micturition, difficulty in urination and occasional smoky urine for last 15 days associated with mild pain in flank region, persistent haematuria, nausea and vomiting. On ultrasonography of Abdomeno- pelvic region, calculus with the size of 13.8 mm at the Vesico-ureteric junction on left side with mild hydronephrosis was found. Patient was treated with *Kalyana kshara* and was advised to repeat the USG after one month. USG revealed that there was neither the impression of calculus nor the hydronephrosis.<sup>[15]</sup>

### Kadali Paneeya Kshara

In a case study, where a 23 year old female patient presented with complaints of severe pain in left flank region associated with nausea, burning micturition, pain radiating to groin region, who came to Mahaveer College of Ayurvedic Science, Sundra Rajnandgaon Chhattisgarh had underwent a USG abdomen and was found an echogenic focus of size 6.3mm in left lower ureteric with grade-1 hydroureteronephrosis. *Kadali Paneeya Kshara* was given in 125mg capsule total in 2 divided doses orally

in the morning and evening with lukewarm water as the *Anupana* after meal for 6 weeks and the follow-up was done every 2 weeks for 4 weeks for additional 10 weeks total duration. After 2 weeks of medication, her complaint of intermittent radiating pain had gradually reduced and patient was improved symptomatically. After 6 weeks repeat USG was done and showed no evidence of clinical symptoms and ureteric calculi with hydroureteronephrosis.

### **Mulaka kshara**

In this study, with a pre-test and post-test study design, a total number of 30 samples were randomly selected and allocated into single group who attended the OPD and IPD, Department of Shalya Tantra of SDM College of Ayurveda and Hospital, Hassan. All the 30 patients were administered *Mulaka Kshara* for a period of three weeks in the dose of 1gm in divided dose before food, twice in a day for 21 days. The subjects were asked for follow up once in a month for three consecutive months. The subjective and objective assessment was done after collecting data and analyzed with relevant statistical parameters. *Kalyana kshara* provided significant relief in pain abdomen and burning micturition and brought back the urine pH to normal level. It significantly increased the frequency of urination thus proving its *Mutrala* action. The size of the remaining stones was also found decreased after the treatment and the study concluded that *Mulaka Kshara* is an effective drug for the expulsion of the urinary stones.<sup>[18]</sup>

### **Palasha kshara**

In a study, 50 patients of urolithiasis (24 patients with renal calculus and 26 patients with ureteric calculus) were given *Palasa Kshara* (1gm TDS for 30 days). On the basis of radiological findings, the drug was found to be effective in expulsion of calculi (more effective in expulsion of ureteric calculi as compared to renal calculi).

### **DISCUSSION**

*Kshara* is a unique therapeutic preparation of Ayurveda that is used in the form of oral administration, *Kshara karma* and also in the form of *Kshara sutra*. *Kshara* is of two types as *Paneeeya kshara*, which is used for oral administration and the *Pratisarana kshara*, the one used for local treatment. This come under the Shalya Tantra branch of Ayurveda and is prepared from a plant extract. Compared to the other oral medications that are described in this science, *Kshara* is said to be superior as it has the property of treating the vitiated *Tridoshas* and cures the disease. *Kshara* has very wide range of properties and actions such as *Shodhana*, *Ropana*, *Shoshana*, *Pachana*, *Dahana*, *Darana*, *Vilayana*, *Stambhana*,

*Lekhana*, *Krimi*, *Aam*, *Kushth*, *Vishghna* because of its *Shukla*, *Soumya*, *Ushna*, *Teekshna Gunas*. Due to its unique properties, it performs the functions like *Chedana*, *Bhedhana*, *Lekhana*, *Ropana* etc. it also digests the *Ama*.

*Kshara* is a substance by which the diseased part of the body are treated and cured. These *Ksharas* are made up of the concentrated salts and alkalies obtained mainly from herbs. *Kshara karma* is the important para-surgical procedure. It is indicated in the diseases that could not be treated with *Shastra karma* by Acharya Sushruta. Though *Kshara* is characterized by all gunas mentioned in the classics, if it is not used wisely, it might lead to harmful effects.<sup>[19]</sup>

Multiple treatment modalities and therapies have been explained in Ayurvedic science to treat the disease *Mutrashmari* or the Urolithiasis. Acharya Charaka advises use of *Ushna Tikshna Dravyapana* in *Kaphaj Mutraashmari*.<sup>[20]</sup> Acharya Sushruta, the Ayurvedic surgeon who is the father of both the ancient surgery and the modern surgery has given a special place for *Kshara* and advises one to try with oral medications such as *Kshara Kalpana* (medicated alkali preparation), *Ghrita* (medicated ghee), and *Taila* (medicated oil), which possesses the properties such as *Chhedana* (cutting/breaking), *Bhedana* (splitting), *Lekhana* (scarification) and *Mutrala* (diuretic), and *Kwath* (decoction) for facilitating the disintegration of the urinary stones even before performing the *Shastra karma*, and *Shastra karma* should be administered at the last even if *Kshara karma* fails to treat the disease.<sup>[21]</sup>

After urinary tract infection and BPH, Nephrolithiasis is considered as the third commonest disorder of the urinary tract and in Ayurveda this can be correlated to *Mutrashmari*. Acharya Sushruta explains in detail about the *Mutrashmari*, its 4 types with symptoms and management in his Samhitha and advises to treat the disease with taking precautions, as it is one among the *Astamahagadas*.<sup>[22]</sup>

*Paneeeya kshara*, a type of *Kshara*, also called as internal alkali preparation has been indicated in the treatment of *Mootrashmari* by Ayurveda Acharyas due to its properties like *Chedana* (excision), *Bhedana* (incision), *Lekhana* (scraping), *Krimighna* (anti-helminthic), *Shodhana* (cleaning), *Ropana* (healing), *Vilayana* and *Pachana* (digestive) etc. These properties play a very effective role in the removal of *Mootrashmari*.<sup>[14]</sup>

Recurrence of the calculi and prevention of it is a great challenge and constant efforts are being made to evolve an effective treatment in both the modern and Ayurvedic science. Conventionally, the calculi's are treated with multiple therapies and though there are

various treatment options available for patients, it has its own advantages and disadvantages and there is no proper treatment that provides the complete relief.

As per one study, dietary changes and fluid intake play an important role in preventing the recurrence of kidney stones. And many studies have shown that increasing urine volume to at least 2 lit/day can reduce the recurrence of stone disease by up to 40–50%.<sup>[23]</sup> Combination therapy used includes alpha adrenoreceptor blockers, calcium channel blockers, corticosteroid, analgesics, and hydration.<sup>[24]</sup>

According to the American Urology Association Nephrolithiasis Clinical Guidelines panel in its recent guidelines it has found that MET facilitates and accelerates the spontaneous passage of ureteric stones and the stone fragments generated by shock wave lithotripsy.<sup>[25]</sup>

The alkaline nature of *Kshara* neutralizes the hyper tonicity as well as acidity of urine itself. The *Chedana* (excision), *Bhedana* (incision), *Lekhana* (scraping) properties are non invasive treatment methods for the fragmentation of calculus. The *Shodhana* (cleansing) and *Ropana* properties of *Kshara* helps in the friction of spiky and nodular type of *Ashmari* (*Vatajashmari*/Oxalate) by disturbing the pathology of the formation of stone and the lacerated mucosal surface of the urogenital tracts.

The present study focuses on the *Mutrashmari* or the urolithiasis and its management through the administration of *Paneeya kshara*. Hence the studies including the clinical trials and case studies on the management of *Mutrashmari* and the different types of *Paneeya kshara* that were used in the studies were systematically reviewed to put the best possible inputs into this study so that it helps the future researcher in conducting further studies on the disease and the intervention.

## CONCLUSION

Renal calculi or the urolithiasis is a painful condition that affects the quality of life of the patients suffering from it. In Ayurvedic science this condition is correlated to *Mutrashmari* and has been explained in detail by Acharya Sushruta. This study focuses on the different types of *Paneeya kshara* or the medications that are prepared with the alkaline substances. Various clinical trials and case studies that have used the *Paneeya kshara* in the management of *Mutrashmari* have been reviewed in this study and these studies have showed significant changes in the reduction of the size of the renal calculi with the reduction of symptoms.

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