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Herbal Treatment of Kidney Stones: A Review

Fiza Amjad[1], Saman Ishfaq[1], Qanta Afzal1, Ayesha Nadeem[1], Muhammad Akram[1], Nimra Shahid[2], Muhammad Adnan[2], Syed Sadat Ali[3*]
[1]Department of Eastern Medicine, Government College University Faisalabad Pakistan
[2]Alsehat Unani Medical College Faisalabad Pakistan
[3]Associate Professor, Department of Physiology, Sri Siddhartha Institute of Medical Sciences & Research Centre, T-Begur, Bengaluru, India

A B S T R A C T
Kidney stones have been rising in prevalence both domestically and worldwide. The healthcare system provides a great variety of treatments. The advancement of treatment effectiveness through cost-effective research may benefit patients, healthcare providers, and the whole healthcare system. Therapeutic options include medication in which herbal or allopathic drugs are included along with surgical intervention. Since a decade, there has been a surge in the research on cost-effective therapeutic options, but we do find very few reviews regarding the same. Keeping this in view, a Medline search was done to review relevant articles in English literature on evaluation of different herbal therapies available using the MeSH terms herbal therapy, renal stones & preventive measures. Data were constructed; issues were reviewed to illustrate the effects of these on the outcome and correlate on the reduction in the burden of disease across different population.

Keywords:*Herbal Therapy, Renal Stones, Prevention, Risk factors & Cost-effective.*

Corresponding Author
Syed Sadat Ali
Department of Physiology, Sri Siddhartha Institute of Medical Sciences and Research Centre, T Begur, Nelamangala (T), Bengaluru Rural 562 123, Karnataka, India

INTRODUCTION
As people are adopting advancements in their lifestyle, they also sense various harmful health issues. One of them is kidney stones.Advanced medical technology has reduced the risk of horrible diseases by providing a better healthcare system. Many therapeutic options are available now.

Modern medicine provides a huge variety of treatments and drugs for the purpose to cure a disease. Most of the world's population demands easy and beneficial treatment at a low cost due to financial and accessibility issues. Almost 75% of people are related to nations that are going through financial or economic issues. They prefer herbal medicine treatment because it is easy in their range. [1-3]

Traditional treatments are very beneficial to cure diseases like hemorrhoids and renal tract infections. Urinary stones are crystals in the form that can be found anywhere in the urinary tract, this condition is called urolithiasis. [4,5].

According to paleopathological data, this illness first appeared almost 7,000 years ago. Because they can develop with age, kidney stones are a major global health concern. Men have been affected three times more the women. This health issue is rare in youngsters.

The urinary stone ratio is different or varies from place to place according to geography or climate changes. Different ratios are given below

- The kidney stone ratio in USA and Europe is 0.1-0.4% each year
- In Asia, the urinary stone ratio is 2-5%
- In Europe and North America, up to 8-15% population is affected
- In Saudi Arabia, its ratio is 20% of the whole population

Some countries have the highest ratio of the occurrence of kidney stones such as Scandinavian (Denmark, Norway, Sweden) and Mediterranean (Greece, Malta, Cyprus) central Europe, northern Australia, and Asia countries including Pakistan China, and northern India.

To investigate the location, position, and size of the urinary stones different procedures have been done like X-rays and USG. Special medical terms are used to describe the different positions of stones in the urinary tract. If stone forms in the kidney, it is called nephrolithiasis, in ureters it is known as ureterolithiasis and in the urinary bladder, it is termed cystolithiasis. In the composition of kidney stones, many contents are included. These contents are uric acid, calcium, inorganic or organic crystals, calcium phosphate, calcium oxalate, struvite, and ammonium acid.

Calcium oxalate and calcium phosphate both contribute to 60-80% mass formation of the urinary stones instead uric acid takes part in the 10-20%of the stones. 1

Introduction of the urinary system:

The urinary system of the human body is composed of many parts that purify the blood and remove waste material in the form of urine.

On the back of the body, beneath the final two pairs of ribs, are two kidneys that resemble beans. They are connected to the urinary tubes called ureters and these tubes are connected to the elastic chamber called the bladder.Human blood contains water and the body's waste material kidneys purify the circulating blood and convert excess water and waste material into the urine. [6-7]

Human blood needs balance in the concentration of salts and ions in the body. Therefore, kidneys filter the blood and remove excess salts and ions in the form of urine. Urine then passes to the bladder through urine tubes, the bladder stores urine temporarily. When urine is stored in the bladder then it is secreted out through the urethra. [6,8]

Nephrolithiasis or kidney stones are most common in the western world. Urothiliasis occurs about 0.5% per year. Its developing risk is up to 10-15% but in the middle east, it increases by about 20-25%. [6,9]Calculi can also be called stones, uroliths, or crystals. These calculi can be found anywhere in the urinary tract with different stones composition. Stones are made of crystalline, organic, or polycrystalline matrixes. [6,10]

Composition of kidney stones:

Kidney stones are a lump of crystals that are present in one or both kidneys with different sizes and shapes. Mostly stones pass from the kidneys to the bladder through urine but in the case of large stones, proper treatment is required to remove stones from the urinary system. Phosphate, uric acid, magnesium ammonium phosphate, and struvite all contribute to the crystallization of urinary stones.[6,11]

Urinary stones have a calcium content of75%, calcium oxalate of50%, and calcium phosphate of 5%. Investigation test is needed to ensure the risk of the formation of kidney stones. Contents that can increase the risk are given below:

- Hypercalciuria
- Hyperoxaluria
- hyperuricemia
- hypocitraturia [6,12]

A balanced PH is required for healthy functioning in the body. Unbalanced PH can cause abnormality. The development of uric acid stone can be formed by low PH of urine, high PH can cause calcium phosphate stones, but the stones that form at any PH level are calcium oxalate stones. [6,13]

Types of kidney stone:

Here are four major types of deposition in kidney stone. These are following;

a. Stone of cystine (1-2%)
b. Uric acid (6-10%
c. Calcium (75-85%)
d. Struvite (2-15%)

All these stone depositions have different occurrences and frequencies depending on human population and geographic area. Sometimes prolonged use of medicines is the cause of kidney stones which are roundabout 1%. [6,14]

1. calcium stone:

Hypercalciuria, which is linked to the presence of calcium oxalate, calcium urate, and calcium phosphate, is what leads to hyperparathyroidism. The excessive absorption of calcium from the intestines, which results in renal calcium or phosphate leak, is the cause of hyperuricosuria. Then hypocitraturia, hypomagnesuria, and hyperoxaluria also start to appear. [6,15], globally is noticed that is a calcium stone [6,16] and this is basically caused by obesity because obesity

has very bad effect on excretion of body including with urinary calcium, uric acid, sodium and calcium citrate. So, it can cause the major issues of calcium stone and risk of developing uric acid stone. [6,17].

2. Struvite stone:

Magnesium ammonium phosphate deposition is the basic cause of struvite stone so collecting system is filled partial or complete staghorn calculi by its grow up. The gram-negative urea splitting rods found in the proteus, pseudomonas, and klebsiella species are the cause of this tract infection. [6,18].

3. Uric acid stone:

The development of uric acid stone is basically formed by intake of those drugs which have heavy amount of purine or maybe high cell turnover like malignancy mostly found in patients having gout. This stone forms in mildly acidic urine with a pH of 5.5 and is typically radiolucent and readily seen on X-ray film. [6,19].

4. Cystine stone:

It is genetically induced stone formation due to intrinsic metabolic disorder called cystinuria. The re-absorption of cystine in the renal tubules is hindered. The cystine stones have very high sulfur content therefore these are very hard to visible on X-ray film. [6,20]

5. Drug induced kidney stone:

Drugs which are reused for different diseases can cause kidney stone apparently. These are including sulfa silicate (antacids), indinavir, Tria metermen, Guaifenesin and atazanavir drugs. These are easily seen radiolucent x-ray and usually it is rare case. [6,21].

Sign and symptoms:

Earlier, there are no clear signs of kidney stone & the patient start to sense when all of mechanism of its formation is completed leading to hydronephrosis in the kidney wherein the stone formed in kidney have passed toward the bladder via ureters. During passage, some stones remain in ureter and block the urine flow during pass out from kidney. So, this situation causes pain and swelling. Without identification we cannot observe any symptoms [6,22].

i. It is stated by some women patients that the pain of kidney stone is much worse than a labor pain (childbirth pain). It is Manner to come and go it is feeling suddenly too high and then comfort at the next moment. This sudden, acute stabbing and wavy pain fails in bed and it is all over sides then it moves toward lower abdominal region or genital spaces.
ii. Sudden feelings of urination. [6,23].
iii. Burning sensation at urination.
iv. Blood particles RBCs are included in urine; therefore, their color turns dark and red. Sometimes we cannot see this with the naked eye because blood particles are very little in urine.
v. Patients feel vomiting and nausea.
vi. Ben feels by the male patient at their tip of penis also. [6,24].

Risk factors of kidney stone:

Our diet plays a chief role in the evolution and inhibition of kidney stones. Environment is also another factor which is included in kidney stone formation. Our fluid intake amount, our body weight and genetic setup involved in it. These are the following factors which are involved in stone formation called risk factors. [6,25]

A. Hydrating routine or less intake of fluid.
B. It is also a genetic disease. (Cysteine stone is caused by a genetic disorder called cystinuria).
C. Disco kidney stone is also increasing due to high intake of protein, fats, sugar and sodium.
D. Kidney stones can also develop by metabolic syndrome.
E. It is also induced by obesity.
F. If a patient having kidney stone and urinary tract infection (especially woman) will develop struvite stone as compared to other diseases. [6,26]
G. The process of aging or increasing age is also a risk factor of kidney stone.
H. Glycosaminoglycans (GAG) concentration, citrate, pH volume CaOx crystals are urinary volume these all factors are also involved indirectly.

Mechanism of stone formation:

Considered factors which are of following;

I. Genetics
II. Diet
III. Age
IV. Mental health

V. Profession
VI. Races and constitution.

Urinary incontinence is due to abnormal renal morphology. Urinary tract infections, metabolomics anomalies.

Genetic factors:

i. Inhibitors of crystallization pass out less frequently than stone forming components are excreted more frequently.
ii. Physio_ chemically changes in the body because of supersaturations of constituents.
iii. To explain abnormal crystalline urine, we use Crystaline urine aggregation, and Crystaline urine growth terms.
iv. Urinary stone development. [1,27].

Urinary stone:

Hard and mineral masses called urine calculi are trapped in urinary system at any point. A proper system like machinery is involved in filtration of blood to eliminate liquid waste called urine and excrete it out from body. In this process the kidney, ureter, bladder and urethra are organs involved in it. Then stone formation is complete in kidney and grow there then it migrates through the urinary canal and where it has a lot of chances to lodge it in smaller tubes like bladder stone, kidney stone, ureteric stones.[1].

Pathophysiology of urinary stone:

It is difficult to explain the pathophysiology of urolithiasis since it involves numerous physiochemical processes that take place either sequentially or simultaneously. Despite increased research over the past ten years, the mechanism by which calcium oxalate crystals are stored in the kidney and develop into renal stones is still not fully understood. [28]The frequency of both calcium and uric acid stones has increased during the previous ten years can be seen in obesity plagued countries. Supersaturated ionic urine is required for the formation of stone. Additionally, complications, ionic strength, solute concentration in the urine, and urinary pH all affect supersaturation level. Three factors must exist for struvite calculi to form. [6]

I. Ph alkaline of urine
II. In the urine the availability of urea or ammonia.
III. In the urine there is a high amount of minerals.[29]Creatinine, calcium, sodium, citrate, oxalate and uric acid required in minimum amount in urine collection. [6]

Chemistry of Urinary Stones:

The estimated prevalence of urolithiasis is 3% to 5% and it is a common disease in adults. In 40% to 50% of children urolithiasis is associated with an identifiable metabolic abnormality. Urinary stones in children are chemically like those in adults. Stones are a composition of different minerals. Half of it is calcium oxalate 15, calcium phosphate is 25%, and calcium oxalate and phosphate are mixed 10-15%. 15-30% accounts for struvite (magnesium ammonium, phosphate), 6-20% for cystine, and 2-10% for uric acid [30, 31]. Most of these stones are apparent on plain radiographs due to their relatively high densities based on their calcium content, though some are more visible than others.[1]

Diseases connected to the production of stones:

- Hyperparathyroidism (Parathyroid gland produce an excess amount of parathyroid hormone)
- Nephrocalcinosis (Deposition of calcium in the kidney parenchyma and tubules)
- Gastrointestinal problems (such as Crohn's disease, intestinal resection, jejunum-ileal bypass, and malabsorptive ailments Sarcoidosis)

Diagnosis

Blood analysis:

A blood test can determine whether there is too much uric acid or calcium in the blood. Blood test results are used to determine the kidneys' state of health and to help doctors rule out other illnesses. [6,32] The level of substances such as calcium, creatinine etc. are checked by it.

Urine testing:

A 24-hour urine collection test is used to determine if the kidneys are excreting too many stone-forming minerals or not enough stone-preventing chemicals. For this test, the doctor advises collecting at least two urine samples over two days in a row.[33] The chemicals found in urine are calcium, phosphate, uric acid, oxalate, and citrate. If your level is not normal it shows that you have kidney stones. [6]

Imaging:

An imaging test may be used to determine whether kidney stones are present in the urinary tract. If small kidney stones cannot be detected by a simple abdomen x-ray, there are high-speed or dual energy computed tomography imaging test choices that can detect even the smallest stones (CT). [34]Other imaging possibilities include taking x-rays, getting CT scans, and injecting dye into an arm; the dye travels through the kidneys and bladder. These non-invasive tests include intravenous urography and ultrasound. [6,35]

Treatment of kidney/urinary stones:

Small stones:

While doing ultrasound if small stones are found in the kidney there will be no need for necessary treatment for small stones because they easily get off from the body by drinking accurate amount of water. Water consumption of 4-5 litres per day aids in the removal of stones from the body through the urine. The discomfort caused by the migration of the stones can be reduced by administering certain painkillers. [6,36]

Medications used to treat kidney stones:

For relaxing the muscles of ureters mostly physician prescribe with alpha blockers, which helps to pass kidney stone more rapidly. Diuretic medications are also useful for boosting urine flow to flush out the stone. [6,37]

Large stones:

By drinking plenty of water large stones are not removed from the body because they can stick in renal tube. Due to the harm they do to the body, stones can lead to kidney damage, internal bleeding, nephron loss, or an increased risk of contracting certain Uti infections. Due to being large stones cannot pass out from the kidney due to their chances of breakdown. UTIs infections, damage to kidney and bleeding are caused by them. [6,38]

Extracorporeal shock wave lithotripsy:

In this method, intense vibrations caused by shock waves or sound waves are used to shatter large kidney stones into smaller fragments. The body's urine can easily expel the fragments of fractured stones. [6,39]

Nephrolithotomy:

Nephrolithotomy is one of the best options if large stones are found in or near kidneys. General anesthesia is given to the patient during this surgery. The tool, which includes a thin telescopic instrument, is used to remove kidney stones larger than 2 cm (about 0.79 in). Stones that are near the pelvic region this instrument is best to used. [6,40]

Herbal treatment of kidney stone:

Herbs and herbal medications are helpful in the treatment of kidney stones. These medications have sparked attention among people because of their clinically validated benefits, such as immunomodulation, adaptogen, and antimutagenic properties. Due to the abuse of synthetic pharmaceuticals and increased frequency of bad drug reactions, people are compelled to revert to using natural therapies. [6] Many therapy alternatives have been established in recent years for urinary stone diseases. Many of these therapies require surgery, are quite expensive, and are frequently unavailable. Because of this, most people select or can only access traditional herbal treatments for urinary stones, such as ayurveda.[1]

1: Celosia argental (Viratarvadigana):

It belongs to the family of Amaranthaceae. This herb is frequently utilized in conventional medicine. It is regarded as unique for the treatment of urinary stones in the Indian medical system. This herb's decoction is particularly helpful for the breakdown and evacuation of stones. It has health benefits for kidney and bladder stones and commonly well known as patharphodi or ShillaPushp. [1,41]

Dose:10 mg (about the weight of a grain of table salt) dosage is given 3 times daily.

2: Fenugreek seed (Trigonella foe Num-graecum):

It is a member of the Fabaceae family. Due to its therapeutic benefits, it is frequently utilised in ayurvedic medicine. The seeds of this herb are used to treat and prevent kidney stones in northern Africa. It helps to prevent kidney stones and significantly reduce calcification in the kidney, it was found by animal study. [1,42]

Dose: This used in different dosage form like

Tea: 10 oz., 1-2 tsp. dry seed (about 295.74 ml). water, 15-20 minutes of decoction, 30 minutes of steeping, and 4-6 ounces (about 177.44 ml). 2-4 ml of TID Tincture (1:5) (about 0.14 oz).

3: Shatavari root (Asparagus racehorses):

It belongs to the family asparagus. It improves diuretic activity. In numerous test animals, it was discovered to prevent the development of calcium oxalate stones, similar to an experiment done on cows. [1,43]

Dose: Various dosage forms, including
Tea: Decoct 1 tsp. dried, powdered root in 8 oz. of water for 10 minutes, then steep for 40 minutes. Drink 2 cups per day.
1:5 tincture: 2-4 ml (about 0.14 oz).

4: Stonebreaker/Chanca Piedra (Phyllanthus niruri):

It is a member of the Phyllanthaceae family. Due to its diuretic properties, it has a long history of use for avoiding and passing kidney stones, and it may be utilised in tropical climates. This herb's regular use assisted in preventing kidney stone development. Numerous in vitro and animal research have confirmed it. [44] This plant was discovered in human research to lower urine calcium levels in people with hypercalciuria. [1, 45]

Dose:It comes in a variety of dose forms, including
Tea: 8 oz., 1-2 tsp. dry herb (about 236.59 ml). a half-hour steep in hot water. Take two to three cups daily. 3-6 ml of tincture (1:5).

5: Gok Shura fruit/root (Tribulus Terrestris):
It belongs to the family Zygophyllaceae . This herb is a nephroprotective agent and is used to treat urinary tract disorders in China and India. It helped to preserve the early-stage urolithiasis and prevented the formation of kidney stone found by animal studies. Tribulus also offers protection against kidney damage brought on by calcium oxalate, according to animal findings from in vitro studies. [1,46]

Dose: This will give in Powder form ½ - 1 tsp.

6: Origanum vulgare:

It belongs to the family Lamiaceae.In nature, this plant is frequently utilised as a spice and for therapeutic purposes. As a diuretic, lithotripter, and antispasmodic, it is also employed. It was possible to demonstrate in vitro inhibitory activity in the nucleation and aggregation of calcium oxalate crystals as well as a reduction in the number of crystals produced in calcium oxalate unpalatable solutions by using a crude aqueous metabolic extract of the aerial part of Origanum vulgare. [1,47]
Dosage: 600mg dosage of this drug per day may be considered safe for usage.

7: Bark from the barberry root (Berberis vulgaris):

It belongs to the family Berberidaceae. The oxidative stress caused kidney damage and calcium oxalate crystallization that was inhibited by taking barberry. The most effective preparation for usage is water extract. [1,48]
Dose: Best dosage will give in the form of
Tea: 10 oz. of 10 tsp. dry root bark (about 295.74 ml). water, decoction
10-15 minutes.

8: Black cumin seed (Nigella sativa):

It belongs to the family Ranunculaceae. Its seeds are used as antihypertensive and diuretic. In an animal experiment it was found that it protects the formation of calcium oxalate stones. [1,49]
Dose: Its dosage will give in the form of
Tea: 8 oz. boiling water, 12 tsp. dry seed, soak covered for 20 minutes.

9: Punarnava herb (Boerhaaviadiffusa):

It is a member of the Nyctaginaceae family. It is mostly employed in the traditional and ayurvedic medical systems. It has anti diabetic and diuretic activity. It is utilized as a kidney-restorative herb and aids in the expulsion of kidney stones. During the in vitro study it was found that it inhibits the formation of struvite stones. [1,50]
Dose: Fresh juice will be taken as daily dosage form

10: Varuna bark (Crataevanurvala):

It belongs to the family Capparidaceae. Urinary calcium excretion and kidney stone formation are reduced by taking daily intake of this herb. It is used with banana stem to treat kidney stones and it also helps to prevent them. Recent studies on humans have concluded that it eases the transit of renal calculi, dissolve them, and lessens pain.[1,51]
Dose: Its dosage will give in the form of
Tea: 2 tsp. dried bark, 12 oz (about 354.88 ml). water, decoction 15 minutes, steep ½ hour. 8 oz (about 236.59 ml). 2-3 times daily, 4-5 ml of tincture (1:5).

11: Evening primrose seed oil (Oenothera biennis):

It belongs to the family Onagraceae.. In a human investigation, it was discovered that taking 1000 mg of evening primrose seed daily helped lower urine oxalate, calcium, and the Tiselius risk index while considerably raising citraturia, a test for the likelihood of developing kidney stones. [1,52]

Dosage form:

Its dosage will give in the form of

Tea: 2 tsp. dried leaf, 8 oz (about 236.59 ml). Soak 8 ounces of boiling water for 45 minutes. BID 1:5 tincture: 1.5–3 ml.

12: Rupture wort herb (Herniariahirsuta):

It is a member of the Caryophyllaceae family. It is a conventional herb used to treat kidney stones. CAOx crystalline inhibits intake of this herb daily found in animal studies. [1,53]

Dose: Its dosage will give in the form of

Tea: 1 tsp. dried herb, 8 oz (about 236.59 ml). decoction and water Each day, consume 1-2 glasses for 5-10 minutes.[54]

13: Ammi visnaga:

It belongs to the family Apiaceae. Patients with renal stones have traditionally been treated in Egypt with tea made from the fruits of Ammi visnaga. [55] This fruit's aqueous extract hastens the kidney's natural breakdown of cystine stones. The two main chemical components, khalin and visnagin, have been shown to be effective in treating kidney stone disease brought on by hyperoxaluria. [1,56]

Dose: Its dosage will give in the form of

3 times daily 10-20 drops in water. Tincture: 1-2 ml (about 0.07 oz).

14: Hibiscus sabdariffa:

It belongs to the family Malvaceae. It is a component of Thai traditional medicine and is used for the prevention and treatment of kidney stones. [57]A clinical experiment that examined a cup of tea brewed from 1.5 g of dried H. sabdariffa, taken twice daily for 15 days (about 2 weeks), on 18 patients found a uricosuric effect and a significantly increased rate of uric acid excretion and renal clearance by urine. [1,58] Experiment done on male Wistar rats that divide into 5 equal groups.

Dose: Its dosage will give in the form of

Tea: 8 oz., 1-2 tsp. dried flowers (about 236.59 ml). Take 8 ounces BID/TID of hot water, steep for 20 minutes. Tincture (1:2 or 1:5): 2-4 ml (about 0.14 oz).

Artificial Drug Used to Treat Stone Diseases: These are following synthetic drugs that are used in the treatment of stone diseases[1,59]

1. Amiloride, also known as Midamor, is a diuretic
2. Hypoxanthine analogue, allopurinol (Lupurin, Zyloprim)
3. Bile acid sequestrates such as cholestyramine (Questran)
4. Bile acid derivatives are made from cholic acid.
5. Cardiac glycoside Digoxin (Lanoxin)
6. Bisphosphonate etidronate dihydrate
7. The statin Fluvastatin (Lescol)
8. Gemfibrozil is a derivative of fibric acid.
9. Indinavir - Used as a hydroxyethylene peptide mimic
10. Sulphonamide Derivatives from Zonisamide

Top 7 Benefits of Hot Water Immersion:[60]

HWI allows your mind and body to get rid of all the negative vibes. For centuries, people have used the benefits of hot water immersion. Here is a quick summary of the 7 benefits you can get by immersing yourself in a hot tub.

Reduces the stress-

We all have a busy lifestyle, where a relaxing weekend seems like a rewarding experience. Because of this, lifestyle stress and tension have become a part of our routine.0n the other hand stress causes heart disease or blood pressure and has many negative effects on the body. Hot Water Immersion comes into play. This treatment can give you a magical experience. You can say goodbye to the unwanted stress of your life.

Pain Healer:

The second-best advantage is that it slows down the pain and acts as a pain healer. If you spend a couple of minutes in the hot tube, it will reduce the muscle tension that your body experiences. The pressure of the water relieves your muscles, and it gives a therapeutic massage.

It helps you maintain a good relationship:

Age does not matter in your relaxation. The best thing you can do is HWI. Social interaction is important to improve your mental health but at times, hot water could be your best companion when you need to spend time with yourself. If you have spouse with whom you have not spent quality time for a longer period time, then this is the best way to maintain a good relaxation.

Healthy Weight Loss:

We don't just get relaxed in hot water immersion, but it also reduces the extra pounds. Thinking how? Workout becomes easy by using HWI. And you don't have to worry about it. So, if we see any workout that we seem to be challenging on the surface, then we can always try it in the hot tub and see the difference. The workout could be anything, be it squats, or glitter kicks, we can do it all easily in the hot water. On a routine basis if these exercises are performed in hot water, it would help us burn those unnecessary calories and get us in shape easily.

Quick muscle recovery:

HWI could be more beneficial for sports players for the problems of muscle and tissue which is common and painful amongst athletes. Hot water can reduce muscle tension, which helps the body to relax the muscles. So, if you face sore muscles then dip yourself in the hot water tub and see the amazing result.

Eliminates toxins from the body:

If we immerse ourselves in warm water, then the temperature of the body increases. This result improves blood circulation and pumps nutrients to the body. The entire process of HWI also ensures that the body can eliminate toxins more easily, and the risk of chemical waste storage in the body is reduced. As this technique removes harmful toxins, it is ideal for those suffering from kidney problems.

Peaceful sleep:

At least 7 to 8 hours of peaceful sleep is important for regular functioning. One of the crucial activities you should do before bed is hot water immersion. If we soak ourselves in hot water, it makes the body get rid of tension and stress. There are so many advantages of hot water that we don't have to miss out on giving our body some minutes after a busy day. It will relax the body and give a magical effect.

How Long Should You Soak in Hot Water?

You should soak in warm water for at least 15 to 30 minutes to get the most out of its benefits. However, you can extend the session to 45 minutes if you feel like it. A comfortable hot tub should be kept at a temperature of about 100°F. 102°F, but you can go as high as 104°F, depending on your temperature preference. Always remember that the higher the temperature, the shorter the session. Avoid alcohol and electronics to get the most out of your hot water immersion session.

Prevention:

Patients who already have kidney stones run the chance of getting more in the future. We can do the following measures (60).

- **Increase fluid intake:**

Increase your daily fluid consumption by two to three liters, depending on your diet. Water and lemon drinks are best. Orange juice and lemon water have both been proved to aid in kidney stone prevention.

- **Limit salt/sodium:**

Limit your daily salt intake to 2,300 mg (about twice the weight of a small paper clip). The kidneys expel more calcium because of sodium, which raises the risk of kidney stones. By reading food labels, you can keep an eye on your sodium intake.

- **Adjust calcium supplementation:**

This may have an impact on calcium oxalate formation. Although some studies have proved that calcium does not worsen stones. If taken without food, several supplements have been shown to impact how some stones develop. If you have a history of developing calcium oxalate stones, your doctor can advise you on the best calcium level.

- **Reduce animal protein:**

Don't lower your daily intake of animal protein to fewer than six ounces. Uric acid stones can occur in response to eating meat and other sources of animal protein like eggs and fish. because purines are present in them. Consuming less meat, especially if you already have stones, can lower your risk of developing uric acid stones.

- **Avoid foods high in oxalate:**

Those who are at a high risk of getting calcium oxalate stones should stay away from foods high in oxalate, like spinach and many forms of beets.

- **Consult a dietician:**

If you are susceptible to kidney stones. You can learn about foods that aid in kidney stone treatment from a dietician who specializes in kidney stone prevention. Depending on the kind of stone you have, the treatment plan.

Table 1: List of plants used for the treatment of kidney stone and urinary tract troubles:

Sr. No	Botanical name	Family	Common name	Part used	Dosage
1	Elymus repens	Poaceae	Couch grass rhizome	leaves and roots	Tincture: 3-5 ml
2	Solidago spp	Asteraceae	Golden rod herb	ground parts	Tincture: 2-3 ml
3	Eupatorium purpureum	Asteraceae	Gravel root	leaves and flowering stems	Tincture: 1.5-2 ml
4	Aesculus hippocastanum	Soapberry	Horse Chestnut seed	seeds, leaves, and bark,	Tincture: 25-.75 ml
5	Equisetum arvense	Horsetail	Horsetail herb	leaves and stems	Tincture: 1-2 ml
6	Hydrangea arborescens	Hydrangeaceae	Hydrangea root bark	root and rhizome	Tincture: 2-3 ml
7	Piper methysticum	Piperaceae	Kava root	Roots	Tincture: 2-4 ml
8	Ammi visnaga	Apiaceae	Khella seed	umbels and fruits.	Tincture: 1-2 ml
9	Lobelia inflata	Campanulaceae	Lobelia seed	leaves and seed	Tincture:.50-1 ml
10	Althea officinalis	Malvaceae	Marshmallow root	leaves and the root	Tincutre: 30 to 40 drops
11	Parietariadiffusa	Urticaceae	Pellitory of the Wall herb	Above the ground	Tincture: 1.5-2 ml
12	Boerhaaviadiffusa	Nyctaginaceae	Punarnava herb	Leaves and root	Powder: ½ - 1 tsp
13	Crateavanurvala	Capparaceae	Varuna bark	root and bark	Tincture: 4-5 ml
14	Daucus carota	Apiaceae	Wild Carrot seed	seed, aerial parts, root	Tincture: 5 ml
15	Yucca spp	Asparagaceae	Yucca root	stalk and root	Tincture: 1-2 ml

CONCLUSION:

As mentioned, globally kidney stones are one of the most important problems which affects the urinary system. There are many therapeutic options across different practices of medicine which we can use to treat these renal stones. Most of them are highly expensive that people could not afford. Most of the patient focus has seen a shift towards herbal medicine due tounfavorable effects of otheroptions. But there is also a need to develop awareness among people about using herbal medicine. By proving its efficacy in treating numerous ailments, it is necessary to foster faith and trust in the safer indigenous system. Because the cost of the contemporary medical system will rise steadily, we must integrate herbal medicine at the highest level into our healthcare system. With the advantages of greater safety and cheaper cost, we expect that in the future, natural and herbal medicinal systems will compete with modern medicinal systems and as supportive therapy to prevent the further progress & decrease the prevalence of disease even though the surgical intervention may be required in already formed and non-treatable renal stones.

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