ABSTRACT

Nephrolithiasis (Hisat-e-Kulyah) is one of the most common health problems that affect approximately 15 % population worldwide and about 2.3% population of India. Since ancient times Urolithiasis (Hisat-e-Bauliyah) or Hisat-e-Kulyah (Nephrolithiasis) have been treated by Unani physicians like Hippocrates, Galen, Avicenna, Razi, Ibn-e-Zohr and Majoosi through different modes of treatment; Ilaj Bil-Ghiza (Dietotherapy), Ilaj Bit-Tadbeer (Regimenal Therapy) and Ilaj Bid-Dawa (Pharmacotherapy) contain herbanoiminominal source of medicine; can be attributed due to presence of Litholytic, Lithotriptic, Diuretic, and nephroprotective properties. In the present review paper, an attempt has been made to focus on Unani concept and treatment of Hisat-e-Kulyah (Nephrolithiasis).

KEYWORDS: Hisat-e-Kulyah, Unani System of Medicine, Litholytic, Lithotriptic, Diuretic.

INTRODUCTION

Humankind is known to be suffering from urinary stone disease, which was found in tombs of Egyptian mummies dated to 4800 BC and in the graves of North American Indians from 1500-1000 BC.1,2 Hippocrates in the 4th century BC noted renal stones together with a renal abscess and wrote in the Hippocratic Oath “I will not cut the stone”.3

Urolithiasis (Hisat-e-Bauliyah) is a term originated from three Greek words, ‘ouron’ for urine, ‘oros’ for flow, and ‘lithos’ for stone. It is referred to as the process of formation of stone in the urine. The urinary system includes Nephrolithiasis (Hisat-e-Kulyah), Ureterolithiasis (Hisat-e-Halib) and Cystolithiasis (Hisat-e-Masanah).4

Nephrolithiasis is one of the most common health problems that affect approximately 15 % population worldwide and about 2.3% population of India.5,6 Its prevalence is as high as 7.6% in Satpura part of Maharashtra, Gujarat, Madhya Pradesh & parts of Andhra Pradesh. Pendse et. al. had reported a high and progressively increasing incidence of Nephrolithiasis in Udaipur and some other parts of Rajasthan in the western part of India.7 In India, the "stones belt" occupies parts of Maharashtra, Gujarat, Punjab, Haryana, Delhi and Rajasthan. In these regions, the disease is so prevalent that most of the members of a family will suffer from kidney stones sometime in their lives.8

Nephrolithiasis is more common in men (12%) than in women (6 %) with a peak incidence at 20-40 years of age in both sexes.10 Children tend to get vesicle calculi in situations where they are malnourished.11 Once recurrent, the subsequent relapse risk is raised and the interval between recurrences is shortened.11

Unani Concept of Nephrolithiasis (Hisat-E-Kulyah)

According to Ibn-e-Sina (980-1037 AD) the stone is formed in the kidney by Quvat-e-Fayelah (active power) which is the raised temperature rather than the normal temperature of kidney, and Maaddat-ul-Hisat (lithic matter) which is a viscous and sticky substance, may be either phlegm or viscous blood or pus. When expulsive power of kidney become weak due to altered temperament, hot inflammation or ulcer, then inspite of excreting out they retained in the calyces of kidney. Thus the lithic substance dried by the Quvat-e-Fayelah (active power) of kidney to form crystal and gradually becomes stone.12

According to Ibn-e-Zohr (1091-1162 AD), when the kidney unable to excrete out the thick humors due to weakness, then these thick humors become deposited in the kidney as a result of layer by layer crystallizations to form stone.13

According to Ali Ibn-e-Abbas Majoosi (930-994 AD), when more concentrated humors and highly viscous fluid
adhere to the calyces of kidney, thus these humors and fluid dried by the high virulent temperature to form crystal and after some time gradually becomes stone.\[^{14}\] According to Jaleenoos (Galen) Nephrolithiasis mostly caused by the ulcer of kidney, if pus is not passing out, it consolidates to form stone.\[^{15}\]

According to Zakaria Razi (850-923 AD), the cause of this disease is abnormal humors and the body excretes the abnormal humor in the form of viscid fluid which moves towards the kidneys and form crests that cause the stone formation. Recurrence of stone formation is common.\[^{15}\]

### Types of Stone

According to chemical components approximately 80% of stones are composed of calcium oxalate stone (Hisat-e-Tootiyah) and calcium phosphate stone (Hisat-e-Qaimooliyavi); Calcium oxalate monohydrate (40-60%), Calcium oxalate dehydrate (40-60%); Calcium hydrogen phosphate (2-4%) Calcium orthophosphate (<1%), 10% of uric acid and urate stone (Hisat-e-Bauliyah) are composed of pure uric acid or ammonium / sodium urate.\[^{16,17}\] 1% of struvite (magnesium ammonium phosphate produced during infection with bacteria that possess the enzyme urease). The remaining 1% of cystine stone (Hisat-e-Zubaniyah) contains sulphur.\[^{16,17,18}\] 1% of Xanthine stone (Hisat-e-Layyinah) is very rare.\[^{9,10}\] Mixed Stones (50-60%); Mixed calcium oxalate-phosphate (35-40%); Mixed uric acid-calcium oxalate (5%) is common.\[^{19}\]

### Pathogenesis

Urolithiasis is a multicomplex process that results from supersaturation of solute in urine, nucleation, growth, aggregation and retention within the renal tubules.\[^{20}\] Supersaturation occurs when concentration of stone materials is higher in urine.\[^{21}\] There are many substances in the body known as promoters like Calcium, Sodium, Oxalate, Urate, Low urine pH, Tamm-Horsfall protein, Low urine volume, which promote the crystal growth, while inhibitors like Inorganic; Citrate, Magnesium, Pyrophosphate, Organic; Tamm-Horsfall protein (Glycoprotein), Urinary prothrombin fragment1, Renal lithostathine, Glycosaminoglycans, Osteopontin (Uropontin), Nephrocalcin, High urine volume inhibit the crystal growth.\[^{20,22}\] Tamm-Horsfall protein is Promoter of nucleation and growth, inhibitor of aggregation.\[^{30}\] The occurrence of stone formation is also due to imbalance between the promoter and inhibitors in the kidney.\[^{23}\]

The most common cause of calcium oxalate stone is hypoxalurial, which might be due to low calcium diet intake.\[^{24,25}\] Chronic diarrhea, renal tubular acidosis and diets high in animal-protein may all be accompanied by a decrease in urinary citrate and a higher risk of stone formation.\[^{26}\] Hyperuricosuria is associated with both uric acid stones and calcium stones. Uric acid decreases calcium oxalate solubility and encourages stone formation. A high purine diet often underlies hyperuricosuria.\[^{25}\] Hypercalcuria is usually idiopathic but can be the result of hyperparathyroidism.\[^{23}\] Dietary calcium restriction is unnecessary and may, in fact, increase the risk of calcium stone formation.\[^{27}\]

### Etiology

According to Unani concept weakness of kidney, thick & viscous humor, concentrated & sticky fluid, Su-e-Mizaj Kulyah (ill temperament of kidney), Warm-e-Kulyah (nephritis), Qurooh-e-Kulyah (kidney ulcer), weakness of expulsive power (Quwwat-e-Dafe’y’ah) of kidney and high virulent temperature are considered as potential causes for nephrolithiasis.\[^{12,15,28}\] While according to recent concept the major risk factors responsible for the nephrolithiasis are inadequate urinary drainage, microbial infections, diet with excess oxalates and calcium, vitamin abnormalities i.e.; deficiency of Vitamin-A, excess of vitamin D, metabolic diseases like hyperparathyroidism, cystinuria, gout, intestinal dysfunction and environmental factors related to regions with hot and dry climatic conditions.\[^{29}\] The anatomy of the upper and the lower tract might be contributing factor in predisposing an individual to urinary tract infection or stasis.\[^{30}\] The major anatomical abnormalities found were obstruction of the ureteropelvic junction, horseshoe kidney, complete or incomplete duplicated ureter, bifid pelvis, and medullary sponge kidney, are known to be responsible for stone formation.\[^{31}\] Increased rates of hypertension and obesity, which are linked to urolithiasis, also contribute to an increase in stone formation.\[^{7}\] Infecting organisms such as proteus pseudomonas and klebsella produce recurrent urinary tract infection and these organisms produce urea and cause stasis of urine which precipitates stone formation.\[^{6}\]

### Clinical Features

Small urinary calculi pass out of the body without any clinical intervention.\[^{32}\] The spontaneous passage rates of urinary stones ranges between 70-98% for small (<5 mm) distal ureteric calculi.\[^{13}\] Stones greater than 5 mm almost always require urological intervention.\[^{33}\] Typical symptoms of acute renal colic are intermittent colicky flank pain that may radiate to the lower abdomen or groin, often associated with nausea and vomiting.\[^{13,35,36}\] Hematuria, pyuria and burning micturition may be present. Lower urinary tract symptoms such as dysuria, urgency, and frequency may occur as the stone enters the ureter.\[^{14,15,26}\]

### Management of Nephrolithiasis

Intake of fluid should be increased (four quarts a day), use of protein and salt in the diet should be restricted. The dosage of the alkalinzing agent should be adjusted to maintain the urinary pH between 6.5 and 7.0 because of the potential deposition of calcium phosphate around the uric acid calculus. Sometimes d-penicillamine, tiopronin, or captorprils are also used. A pain killer and other medication can also be injected to treat the symptoms of
nasea and vomiting. Antibiotics may be used to eliminate any infection. Calcium channel blockers and adrenergic alpha antagonists and steroids are effective in enhancing the passage of urinary calculi. Large calculi associated with unbearable pain can be treated with Ureteroscopy, Extracorporeal Shock Wave Lithotripsy (ESWL), Percutaneous Nephrostomy and surgery. Phytotherapy with medicinal plants is widely used worldwide as an alternative primary healthcare.

**Unani Therapy**

In Unani system of medicine the main aim of management for nephrolithiasis is to make morbid and abnormal humors easily extractible from the body through the excretory system. It is broadly involved the three types of therapy as follows.

- **Ilaj Bil-Ghiza (Dietotherapy)**
- **Ilaj Bit-Tadbeer (Regimenal Therapy)**
- **Ilaj Bid-Dawa (Pharmacotherapy)**

**Ilaj Bil-Ghiza (Dietotherapy)**

In this way of treatment, plenty of fluid and easily digestible foods like Aab-e-Naryal (coconut water), Jau (barley), Nashpati (pear), Magz-e-Badam (Almond), Gazar (carrot), Karela (bitter guard), Khuskari Nan (non-leavened chapatti), Himisyiah (gram), Teelu, Choozah (chick), Qab-e-Ghemah (goat’s heart) and Asaafeer (sparrow) should be used. High quantity oxalate containing diets such as Asfanakh (Spinach), Cholayi (Amaranth leaves), Tamatar (Tomato), Amlah (Emblica Myrobalan), Cheekoo (sopadilla), Kaju (cashew nut), Kheyar (cucumber), and uric acid containing diets such as Phool Gobhi (cauliflower), kaddu (Pumpkin), Mushroom, Baigan (Brinjal) should be avoided. Hard and late digestible diets like milk, meat, mutton, Faterei Roti, Maidah ki Roti, apple, guava, to be avoided.

**Ilaj Bit-Tadbeer (Regimenal Therapy)**

The basic aim of this type of therapy is Talteef-e-Maddah (softening the disease matter) and Taqtee-e-Maddah (resolving the disease matter). For this purpose, patient is instructed to vomit out and to use of mild Mushilat (Purgatives) like Sapistan (Cordia latifolia), Anjeeer (Ficus carica), Aslussoos (Glycyrrhiza glabra), Khatmi (Althoea officinalis), Seelos (Anethum sowa kutz.), Karafs (Apium graveolens), Persiya wa Shan (Adiantum capillus-vereris), Hulbah (Trigonella foenum-graeceu), Qurtum (Carthamus tinctorius), Behk-e-Kibr (Capparis spinosa), Asphagl (Plantago ovata Forsk.), Khurafh (Plantutaca oleracea), Banafshah (Viola odorata), Barg-e-Kunjad (Sesamum indicum Leaves) should be taken by the patient for a few period. If Mudirrat (diuretics) mixed with the above decoction, the effectiveness is much higher. After Aabzan (Sitz Bath) Roghan-e-Kheri, Roghan-e-Soya (Dill Oil), Roghan-e-Banafshah (Violet herb Oil) should be applied on groin of the patient locally.

**Ilaj Bid-Dawa (Pharmacotherapy)**

The recommended principles of treatment to control nephrolithiasis and to expel out the destroyed stones are illustrated as Tafteet-e-Hisat (Litholytic/Lithotriptic), Idrar-e-Baul (Diuresis), Tuleel-e-Waram (Resolution), along with Taqwiyat-e-Kulyah (Nephroprotective) keeping in view of these above pharmacological properties, the unani drugs to be prescribed in nephrolithiasis, are described below.

**Advia-e-Mufradah (Single Drugs)**

- Habb-e-Balsan (Comiphora opobalsamum Linn.), Habb-ul-Gh’ar (Prunus laurocerasus Linn.), Khar-e-khasak (Tribulus terrestris Linn.), Kuarkundah (Blumea abalsamifera Linn. Dc.), Persiya wa Shan (Adiantum capillus-vereris Linn.),

**Huaqa (Enema) of Mulayyin & Muzliq (lauxiative & emollient) like Tukhm-e-Khatmi (Althoea officinalis), Tukhm-e-Katan (Linum usitatissimum), Asphaghol (Plantago ovata Forsk.) as well as Murakkhi wa Mudir (slackent & diuretic) like Khurafh (Portutaca oleracea Linn.), Bekh-e-Kibr (Capparis spinosa), Persiya wa Shan (Adiantum capillus-vereris) are advised to the patient in constipation.

If obstructive uropathy developed, Huqa (Enema) of Muzliq Lu’aab (emollient mucilage) like Lu’aab tukhm-e-Khatmi (Althoea officinalis), Lu’aab Katan (Linum usitatissimum), Lu’aab Hulbah (Trigonella foenum-graeceu), given to the patient, and Rohgan-e-Badam (Almond Oil) with Maghz-e-Amaltas (Cassia fistula) orally also. Aabzan (Sitz Bath) to relieve the pain, in the decoction containing Musakkin wa Murakkh (sedative & slackent) drugs such as Baboona (Maticaria chamomilla), Khatmi (Althoea officinalis), Shibt (Anethum sowa kutz.), Karafs (Apium graveolens), Persiya wa Shan (Adiantum capillus-vereris), Hulbah (Trigonella foenum-graeceu), Qurtum (Carthamus tinctorius), Behk-e-Kibr (Capparis spinosa), Asphagl (Plantago ovata Forsk.), Khurafh (Plantutaca oleracea), Banafshah (Viola odorata), Barg-e-Kunjad (Sesamum indicum Leaves) should be taken by the patient for a few period. If Mudirrat (diuretics) mixed with the above decoction, the effectiveness is much higher. After Aabzan (Sitz Bath) Roghan-e-Kheri, Roghan-e-Soya (Dill Oil), Roghan-e-Banafshah (Violet herb Oil) should be applied on groin of the patient locally.

Aadzan (Sitz Bath) to relieve the pain, in the decoction containing Musakkin wa Murakkh (sedative & slackent) drugs such as Baboona (Maticaria chamomilla), Khatmi (Althoea officinalis), Shibt (Anethum sowa kutz.), Karafs (Apium graveolens), Persiya wa Shan (Adiantum capillus-vereris), Hulbah (Trigonella foenum-graeceu), Qurtum (Carthamus tinctorius), Behk-e-Kibr (Capparis spinosa), Asphagl (Plantago ovata Forsk.), Khurafh (Plantutaca oleracea), Banafshah (Viola odorata), Barg-e-Kunjad (Sesamum indicum Leaves) should be taken by the patient for a few period. If Mudirrat (diuretics) mixed with the above decoction, the effectiveness is much higher. After Aabzan (Sitz Bath) Roghan-e-Kheri, Roghan-e-Soya (Dill Oil), Roghan-e-Banafshah (Violet herb Oil) should be applied on groin of the patient locally.
Qurtum (Carthamus tinctorius Linn.), Sa’ad Kofí (Cyperus longus Linn.), Tukhm-e-Khurfaḥ (Portulaca oleracea Linn.), Tukhm-e-Kasni (Cichorium intybus Linn.), Tukhm-e-Turab (Raphanus sativus Linn.), Tukhm-e-Karafa (Apium graveolens Linn.), Tukhm-e-Khayar (Cucumis sativus Linn.), Tukhm-e-Gazar (Daucus carota Linn.), Tukhm-e-Kharzah (Cucumis melo Linn.), Hajr-ul-Yahood (Lapis judaicus), Jawakhar (Potassium carbonate), Sang-e-Sarmahi (Fish stones), Shorah Qalmai (Potassium nitrate), Aqrab Sokhtah, (Burnt Scorpion), Asaafeer (Sparrow), Kharateen-e-Mas’hoq (Earth worm), Khakistar-e-Khargosh, (Burnt Rabbit).

Advia-e-Murakkabah (Pharmacopeal Formulation Drugs)
Qurs Kaknaj (Tablet), Qurs Kushtah Hajr-ul-Yahood (Tablet), Kushthah Hajr-ul-Yahood (Powder), Majun Hajr-ul-Yahood (Paste), Majun Aqrab (Paste), Majun Sang-e-Sarmahi (Paste), Sharbat Alu Balu (Syrup), Sharbat Bazoori Motadil (Syrup), Iksir-e-Gurda (Tablet), Jawarish Zaruooni Sada (Paste), Jawarish Zaruooni Ambari (Paste) and Jawarish Jaleenoos (Paste) are used as therapeutic agent.13,14-45 Jawarish Jaleenoos (Paste) and Jawarish Zaruooni Ambari (Paste) can be used as prophylaxis due to its nephroprotective action.41-45

Descriptions of these Pharmacopeal Formulation Drugs in details are as follows.

Qurs Kaknaj
Pharmacological action: Litholytic, lithotriptic, diuretic, Anti-spasmodic.
Dosage: 3 tablets twice a day.
Method of Use: To be taken with 125 ml. of Arq Gaozaban and 25 ml. of Sharbat Bazoori Motadil in morning and evening on empty stomach.

Kushthah Hajr-ul-Yahood
Pharmacological action: Litholytic, lithotriptic
Dosage: 125 mg. powder or one tablet twice a day.
Method of Use: To be taken with 6 gm. of Majun Hajrul Yahood or 20 ml. of Sikanjabeen Sada in morning and evening on empty stomach.

Majun Hajr-ul-Yahood
Pharmacological action: Litholytic, lithotriptic.
Dosage: 6 gm. twice a day.
Method of Use: To be taken with fresh water or 25 ml. of Sharbat Bazoori Motadil in morning and evening on empty stomach.

Majun Aqrab
Pharmacological action: Litholytic, lithotriptic.
Dosage: 3-5 gm. twice a day.
Method of Use: To be taken with water or 60 ml. of Arq Badyan or 25 ml. of Sharbat Bazoori Motadil, in morning and evening on empty stomach.

Majun Sang-e-Sarmahi
Pharmacological action: Lithotriptic.
Dosage: 6 gm. twice a day.
Method of Use: To be taken with 125 ml. of Arq Anannas and 25 ml. of Sharbat Bazoori Motadil or 60 ml Arq Badyan, in morning and evening on empty stomach.

Sharbat Alu Balu
Pharmacological action: Lithotriptic, diuretic.
Dosage: 25 ml twice a day.
Method of Use: To be taken with 6 gm. of Majun Anannas in morning and evening on empty stomach.

Sharbat Bazoori Motadil
Pharmacological action: Diuretic.
Dosage: 25 ml twice a day.
Method of Use: To be taken with fresh water in morning and evening on empty stomach.

Iksir-e-Gurda
Pharmacological action: Lithotriptic, Anti-spasmodic.
Dosage: One tablet twice a day.
Method of Use: To be taken with 6 gram of Majun Hajrul Yahood in the morning and evening on empty stomach.

Jawarish Zaruooni Sada
Pharmacological action: Nephroprotective.
Dosage: 5 gm. twice a day.
Method of Use: To be taken with fresh water in morning and evening on empty stomach.

Jawarish Zaruooni Ambari Ba Nuskha Kalan
Pharmacological action: Nephroprotective.
Dosage: 5 gm. twice a day.
Method of Use: To be taken with fresh water followed by 1 tablet of Qurs Kushhtah Zamurrad in morning and evening on empty stomach.

Jawarish Jaleenoos
Pharmacological action: Nephroprotective.
Dosage: 6 gm. twice a day.
Method of Use: To be taken with fresh water after meal.

CONCLUSION
Because of high cost and adverse effects of minimally invasive techniques, Unani Therapy can play a vital role in crushing the stone, excretion of crystals and prevention from reformation of stone in urinary system through decreasing the promoter level and increasing the inhibitor level. The Unani medicine has benefits of no side effects, economic nature, and no risk of long term use.
REFERENCES


36. Dave C. (Nephrolithiasis Treatment and Management). Available from:


40. https://en.wikipedia.org/wiki/Botanical_name (Botanical Name of the Plants)


44. Anonymous. Therapeutic Index: Dawakhana Tibbiya College. Muslim University Aligarh; Dawakhana Tibbiya College: ynm, 24,25,46,59,66