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Crystal burden: understanding Hasāt al-Kulya (renal calculus) through the lens of modern science and unani tradition

Abstract

Renal calculus, commonly known as kidney stone and referred to as Hasāt al-Kulya in Unani medicine, is a prevalent urological condition marked by the formation of crystalline stones in the kidneys or urinary tract. In modern medicine, stone formation is linked to the supersaturation of urinary solutes like calcium, oxalate, and uric acid, leading to crystallization. Unani medicine attributes the condition to an imbalance in bodily Akhlāt (humors), particularly Safra (yellow bile) and Balgham (phlegm), often associated with a hot and dry Mizaj (Temperament). Factors such as poor digestion, weak elimination, and impaired expulsive power contribute to stone formation.

This review explores renal calculus from both modern and Unani perspectives, covering etiology, symptoms, diagnosis, differential diagnosis, and treatment options. Modern approaches focus on hydration, medications, and surgical procedures such as lithotripsy and percutaneous nephrolithotomy (PCNL). In contrast, Unani treatment emphasizes Ilaj bil Ghiza (diet therapy), Ilaj bil Dawa (herbal medicine), Ilaj bil Tadbeer (regimental therapy), and surgery in severe cases. Effective Unani remedies include Qust-e-Shireen, Gokhru, and Safoof-e-Hajrul Yahood. Modern medicine excels in immediate mechanical clearance, while Unani offers a holistic, preventive, and dissolution-based approach, with special emphasis on humoral balance, stone-dissolving drugs, and strengthening kidney function, which is the novel dimension compared to Convention Medicine.

Keywords: hasāt al-kulya, renal calculus, unani tradition, herbal management

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Introduction

In Unani, Renal calculus is referred to as "Hasāt al-Kulya". Renal calculus, commonly known as kidney stone, is a crystalline mineral material formed within the kidney or urinary tract.[1] It is one of the most common disorders of the urinary tract and has been recognized since antiquity, including in the traditional systems like Unani medicine.[1,2]

Unani concept of renal stone formation

Unani medicine is based on the theory of humors (Akhlat) i.e. Dam (blood), Balgham (phlegm), Safra (yellow bile) and Sauda (black bile).[3] Hasāt (Stone) is the pathological formation of solid masses in the kidney or urinary tract due to imbalances in body Akhlāt (humors), mainly the concentration and solidification of Balgham (phlegm) and Sauda (black bile).[4] A healthy state is a result of balance among these humors (Mizaj-e-Tabi'i), and any Soo-e-Mizaj (imbalance) leads to disease.[2,3,5]

Formation of renal stones in unani view[6,7]

a) Soo-e-Mizaj (Humoral Imbalance): hot and dry Mizaj promotes calcification

Renal stones form due to Soo-e-Mizaj Haar Yabis (hot and dry temperament), mostly of Sauda or Balgham origin. Excessive dryness leads to thickening of urine and aggregation of waste materials.

b) Formation of Hasat kulya (Calculus)[6]

Due to improper digestion and metabolism, waste products accumulate in urine. These viscous or dense residues (especially of Sauda or Balgham) undergo solidification in the kidneys. When urine is concentrated and hot, these residues congeal and transform into stones. Urad (sediments) and Ghair Tabayi Mawad (abnormal waste) combine and solidify

c) Stages[6–8]

Tahleel-e-Akhlat (digestion of humors) fails → waste accumulates

Takhallus-e-Mawad (elimination of waste) is impaired → precipitation in kidneys

These form into Hasa over time due to temperature, dryness, and urine flow issues.

d) Weakness of Quwwat-e-Dafiya (expulsive power): It causes retention and solidification.[7]

Pathogenesis according to conventional medicine[9,10]

(i) Supersaturation of urine

Urine contains substances like calcium, oxalate, uric acid, phosphate, cystine. When their concentration exceeds solubility (due to dehydration or excess intake), they crystallize.

(ii) Nucleation

Crystallization begins when ions form solid crystals (nuclei).

Factors like pH imbalance, low urine volume, and presence of promoters (e.g., uric acid) aid this step.

(iii) Crystal growth and aggregation

The crystals grow by attracting more particles and aggregate to form larger clumps.

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(iv) Crystal retention in kidney

These crystals often get flushed out. But if urine flow is slow or tubular damage occurs, crystals stick to renal epithelium or collect in renal papillae.

(v) Matrix formation

Organic matrix (e.g., Tamm-Horsfall protein) helps bind the crystals and forms a stone.

Types of renal stones[9]

Calcium oxalate stones – Most common; associated with hypercalciuria, hyperoxaluria.

Uric acid stones – Acidic urine; high purine diet.

Struvite stones – Infection-induced; made of magnesium ammonium phosphate.

Cystine stones – Rare; genetic cystinuria.

Risk factors[10]

(i) Dehydration

(ii) High-protein/salt diet

(iii) Obesity

(iv) Certain medications (diuretics, antacids)

(v) Hyperparathyroidism

(vi) Family history

Asbab (etiology) Unani perspective[7,8]

(i) Imbalance of Akhlāt (Humors), especially dominance of Safra and Balgham.

(ii) Haar-e-Mizaj (hot temperament) in organs like kidneys and bladder.

(iii) Qillat al-Shurb (Inadequate hydration)

(iv) Dietary Indiscretions: Excessive intake of hot, dry foods.

(v) Qabiz Tabiyat (Suppression of Urge)

(vi) Weakness of Quwwat-e-Dafʻia (expulsive force) of the kidneys and bladder.

a) Aghziya Muzirrah (harmful diets): e.g., excess lentils, meat, cheese, dry fruits

b) Izterab-e-Hazm (digestive disorders)

c) Qillat-e-Tabreed (lack of cooling temperament)

d) Qillat-e-Maiyat-e-Baul (low urine volume)

e) Soo-e-Mizaj of the kidney (change in kidney temperament) (Table 1).

Table 1 Correlation between unani and modern concept[5–8]

Aspect	Unani medicine	Modern medicine
Basis of concept	Humoral Theory (Mizaj and Akhlat)	Biochemical/Pathophysiological
Cause	Imbalance of humors, especially Sauda and Balgham	Supersaturation of solutes in urine
Initiation	Accumulation and solidification of abnormal waste in kidneys	Crystal nucleation and aggregation
Contributing factors	Hot-dry temperament, improper diet, digestive imbalance	Dehydration, high oxalate/calcium, pH
Preventive measures	Correction of Mizaj, strengthening digestion and renal function	Hydration, diet control, managing pH
Management focus	Tanqiya (detoxification), Tahlil (dissolution), Diuretics	Dissolving/removing stones, preventing recurrent

Signs and symptoms[9,10]

Renal colic: Severe flank pain radiating to the groin. Hematuria**,** Dysuria**,** Nausea and vomiting, Fever and chills (if infection is present) and Frequent urination.

According to Unani system the signs and symptoms include[3–7]

Waja‘ al-Kulya: Pain in the loin.

Husool al-Dam fi al-Baul: Blood in urine.

Ta‘ab wa Dukhul: Discomfort and nausea.

Tahaffuz al-Baul: Difficulty in urination.

Hummā (fever) if associated with infection.

Diagnosis[13]

Investigations: Urinalysis: Microscopy to detect crystals, RBCs, WBCs. Urea, creatinine, calcium, uric acid levels.

Imaging: Ultrasound: First-line imaging, Non-contrast CT KUB: Gold standard and X-ray KUB for radiopaque stones.

Stone analysis: Determines composition.

Unani diagnostic principles

(i) Nabz (Pulse examination) and Baul (urine) analysis.

(ii) Mizaj (Temperament) assessment of the patient.

(iii) Istifsar al-Aʻrad: Detailed inquiry of symptoms and lifestyle.

(iv) Examination of Baul: Consistency, color, sediment (Ruwaasib al-Baul).

Differential diagnosis

Modern differential diagnosis[11]

a) Urinary tract infection

b) Pyelonephritis

c) Appendicitis

d) Ectopic pregnancy

e) Biliary colic

f) Tumors of urinary tract

Unani differential diagnosis[7,8]

a) Waram al-Kulya (renal inflammation)

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b) Qurooh al-Kulya (renal ulcers)

c) Waja' al-Kulya ghayr Hasāt (renal pain not due to calculus)

d) Ihtibas al-Baul (urinary retention)

Management

Medical management[16]

a) Hydration: Oral/IV fluids to increase urine flow.

b) Analgesics: NSAIDs, opioids for severe pain.

c) Alpha-blockers: E.g., tamsulosin for stone expulsion.

d) Antibiotics: If UTI is present.

Surgical/procedural management[14–16]

(i) Extracorporeal Shock Wave Lithotripsy (ESWL)

(ii) Ureteroscopy with laser lithotripsy

(iii) Percutaneous Nephrolithotomy (PCNL)[17]

(iv) Open surgery (rarely used now)

Preventive measures[16]

a) Dietary changes based on stone type.

b) Potassium citrate for uric acid/cystine stones.

c) Thiazide diuretics for calcium stones.

Unani management

Ilaj bil Ghiza (Dietotherapy)[4–6]

Avoid hot, dry foods, Use cooling, moistening foods like:, Barley water, Cucumber, melon, Khurfa (Portulaca oleracea)

Ilaj bil Dawa (Pharmacotherapy)[6–8]

Muqattit (lithotriptic) drugs

Hajrul Yahood (Lapis judaicus), Tukhm Kharpaza (melon seeds), Shahtara (Fumaria parviflora), Ikseer-e-Shif, Mudirr al-Baul (diuretics), Kulthi (Dolichos biflorus), Asl-us-Soos (Glycyrrhiza glabra) etc (Table 2).

Table 2 Single Unani drugs useful in renal stones[5–9,18,19]

Sl. no.	Unani name	Botanical name	Temperament	Action	Mode of action
1.	Qust-e-Shireen	*Saussurea lappa*	Hot & Dry (2nd degree)	Lithotriptic, diuretic, nephrotonic	Mode of Action: Breaks stones, relieves pain, enhances kidney function
2.	Berge Kasni	*Cichorium intybus*	Cold & Dry	Diuretic, kidney cleanser, anti-inflammatory	Increases urine output, soothes inflamed urinary tract
3.	Shahtra	*Fumaria parviflora*	Cold & Dry	Diuretic, detoxifier, mild lithotriptic	Increases urine output, soothes inflamed urinary tract
4.	Gokhru	*Tribulus terrestris*	Hot & Dry (1st degree)	Lithotriptic, diuretic, anti-inflammatory	Mode of Action: Breaks stones, increases urine flow, reduces urinary tract inflammation
5.	Kasni	*Cichorium intybus - root*	Cold & Dry	Hepatorenal tonic, diuretic, anti-inflammatory	Promotes healthy kidney and liver function, reduces swelling and irritation
6.	Baadiyan	*Foeniculum vulgare*	Hot & Dry	Diuretic, carminative, mild lithotriptic	Enhances urine output, relieves spasm in urinary tract
7.	Tukhme Kharpaza	*Cucumis melo seeds*	Cold & Moist	Demulcent, Diuretic Soothe and clear tract	Soothes urinary tract, increases fluid output, helps expel small stones
8.	Turb	*Raphanus sativus - Radish*	Hot & Dry	Lithotriptic, diuretic, digestive	Softens and dissolves stones, stimulates kidney excretion
9.	Maghz-e-Tukhme Kadu	*Cucurbita pepo*	Cold & Moist	Demulcent, diuretic, anti-inflammatory	Cooling, Anti-inflammatory Soothes irritation, reduces burning, helps eliminate calculi
10.	Khar-e-Khasak	*Tribulus terrestris*	Hot & Dry	Lithotriptic, diuretic, pain-relieving	Crushes stones, relieves pain, increases urine flow

Qust-e-Shireen (Saussurea lappa C.B.Clark)[3–5,18]

Mizaj (Temperament): Hot and dry (2nd degree)

Af'āl (Actions)

a) Mufattit-e-ḥaṣāt (Lithotriptic – breaks kidney stones)

b) Mudirr-e-baul (Diuretic – promotes urination)

c) Munaqqīy-e-kulya wa mathāna (Kidney and bladder cleanser)

d) Dāfi' wa rāfi' su'al (Anti-inflammatory and pain-relieving)

Taf'eel (Mode of action)

Lithotriptic action: It helps break down and dissolve the renal calculi (stones) due to its mildly corrosive and solvent properties.

Mudirr-e-Baul (Diuretic): Increases urine output to flush out small calculi and prevents further stone formation by reducing stagnation.

Muqawwī-e-Kulya (Nephrotonic): Strengthens renal tissue, reducing recurrence.

Muḥallil-e-Waram (Anti-inflammatory & Analgesic): Anti-inflammatory reduces local swelling and irritation caused by stones. It

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helps relieve pain associated with renal colic and reduces inflammation in the urinary tract.

Munaqqīy-e-Kulya and masana (Kidney and Bladder Detoxifier) Aids in cleansing the kidneys and bladder, thus reducing chances of infection and recurrence of stones.

Dosage: Safoof (powder) 3–5 grams twice daily with water or Arq-e-Bazoori **Joshanda (Decoction) or Infusion**

Adjuvant: Lukewarm water, Arq-e-Bazoori, or honey

Duration: 15–40 days

Contraindications: Avoid in pregnancy; caution in gastric ulcers

Modern pharmacological studies[7,8]

Contains alkaloids, flavonoids, sesquiterpene lactones with anti-inflammatory, diuretic, and antioxidant properties

Exhibits renal protective effects in animal models

Luteolin and costunolide may contribute to antiurolithiatic activity

Compound Unani formulations[18–21]

(i) Habb-e-Kabid Naushadri

Ingredients: Naushadar, Ammonium chloride, Qaranfal (clove), Sa-t-e-Leemun

Action: Lithotriptic (stone dissolving), diuretic, anti-spasmodic

Dose: 1–2 tablets with lukewarm water

Uses: Effective in expelling small calculi and relieving colic pain

(ii) Habb-e-Mudir

Ingredients: Usarah Mako, Tukhm-e-Kasni, Tukhm-e-Karafs, and others

Action: Diuretic, anti-inflammatory

Dose: 1–2 tablets twice a day

Uses: Increases urine flow to help flush out small stones.

(iii) Majoon-e-Atfal[19, 21]

Ingredients: Qand Safaid, Maghz Badam, Asl-us-Soos, etc.

Action: Lithotriptic, cooling, diuretic

Dose: 5–10 g twice a day

Uses: Safe in pediatric renal stone cases.

(iv) Majoon-e-Piyaz[20,21]

Ingredients: Piyaz (onion), Qand Safaid, Maghz-e-Tukhm Kharpaza, etc.

Action: Lithotriptic, diuretic

Dose: 5–10 g twice daily

Use: Especially used in hot-tempered individuals with urinary disorders.

(v) Majoon-e-Sang Sarmahi

Ingredients: Sang-e-Sarmahi (stone fish), Banslochan, Zafran, etc.

Action: Lithotriptic, anti-inflammatory, renal tonic

Dose: 5–10 g with water

Uses: Breaks down and expels renal and vesical calculi.

(vi) Safoof-e-Hajrul Yahood

Ingredients: Hajrul Yahood, Shora Qalmi, Qalai Musaffa, etc.

Action: Potent lithotriptic and diuretic

Dose: 3–5 g in water or Arq Makoh

Uses: Effective in dissolving calcium oxalate stones.

(vii) Qurs-e-Mulethi safaid

Ingredients: Sat-e-Leemun, Qaranfal, Asl-us-Soos, etc.

Action: Diuretic, anti-inflammatory

Dose: 1–2 tablets twice daily

Uses: Helps in expelling stones and relieving burning micturition.

(viii) Arq-e-Badiyan / Arq-e-Mako / Arq-e-Gulab

Usage: Often used as vehicles (Sharbat/Arq) for compound drugs to enhance their efficacy and absorption.

Action: Diuretic, soothing to urinary tract

Dose: 100–120 ml twice daily with Safoof or Majoon

(ix) Sharbat Bazoori Motadil

Ingredients: Tukhm-e-Kasni, Tukhm-e-Karafs, Badiyan, Gul-e-Gaozaban, etc.

Action: Diuretic, anti-inflammatory, demulcent

Dose: 20–30 ml with water twice a day

Uses: Commonly given with other compound drugs to aid expulsion of stones.

Ilaj bil Tadbeer (Regimental therapy)[20]

a) Hijama (cupping therapy): For pain relief and detoxification.

Hammam (baths): Warm bath for renal colic.[20]

Dalk (massage): Lower back massage for symptom relief.

Ilaj bil Yad (Surgery)[6–8]

In Unani texts describe surgical removal in severe cases.

Prognosis[11]

a) Small stones (<5 mm) pass spontaneously in most cases.

b) Recurrence is common; preventive strategies are essential.

c) With timely management, prognosis is generally good.

Discussion and conclusion

The management of renal calculi highlights a sharp contrast between modern medicine and Unani medicine. Modern nephrology largely emphasizes mechanical interventions such as surgical removal, lithotripsy, or pharmacological measures aimed at altering urinary chemistry to prevent recurrence. However, effective pharmacological dissolution of calcium oxalate stones remains a challenge in allopathy. In contrast, Unani medicine provides a novel and holistic perspective, addressing not only the expulsion or dissolution of stones (Tahleel-e-Hisah) but also the underlying causes (Izala-e-Sabab) such as digestive

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disturbances (Soo-e-Hazm), hepatic dysfunction, and humoral imbalances (Soo-e-Mizaj). Unique formulations like Majoon-e-Hajrul Yahood and Jawarish Zarooni exemplify the polyherbal approach that acts synergistically to dissolve calculi, strengthen renal tissues (Taqwiyat-e-Kulliya), and restore systemic balance, unlike modern pharmacotherapy which depends on single-molecule drugs. Moreover, regimenal therapies (Ilaj bil Tadbeer) such as hammam (steam bath), massage, and exercise enhance metabolism and prevent recurrence, offering preventive dimensions rarely addressed in modern protocols.

Renal calculus, being a multifactorial disorder with high prevalence and recurrence rates, remains a major health challenge. Modern insights into crystallization dynamics and urinary solute supersaturation align conceptually with Unani's humoral theory, suggesting a shared scientific basis despite different frameworks. While conventional treatment relies on hydration, analgesics, and minimally invasive surgeries, Unani emphasizes correcting temperament, improving digestion, detoxification, and enhancing renal function through natural remedies. The integration of Unani therapeutic strategies including lithotriptic herbs, diuretics, dietary modulation, and regimenal therapies—with modern diagnostic precision and emergency care holds promise for improving outcomes, reducing recurrence, and promoting patient-centered, sustainable healthcare. Bridging these two systems may not only enhance clinical efficacy but also represent a paradigm shift toward a more holistic, integrative model of managing renal calculi.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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