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Review Article

Role of Unani Medicine in the Management of *Maraḍ-i-Kulya Muzmin* (Chronic Kidney Disease)

Abstract

Internationally, chronic kidney disease (CKD) is the 12th cause of death and the 17th cause of disability, respectively. Unani medicine is an ancient system of medicine which advocates the treatment of chronic disease with drugs of natural origin. Ancient Unani physician *Buqrāṭ* (Hippocrates) (460-370 BC) recognized for the first time the kidney as a vital organ responsible for urine formation. Unani medicine described kidney disease in detail based on ancient knowledge of the disease and laid down a complete management plan which is still in practice. According to this age-old concept, the kidney has been provided with some specific powers, namely, *Quwwat-i-Jādhiba* (absorptive power), *Quwwat-i-Hāḍima* (digestive power), *Quwwat-i-Māsika* (retentive power), *Quwwat-i-Dāfi'a* (power of expulsion), and *Quwwat-i-Mumaiyāzā* (power of differentiation) upon which normal functioning of the kidney is based. Furthermore, there are four types of abnormalities that take place in the kidney, namely, *Amrāḍ Sū'-i-Mizāj*, *Amrāḍ Sū'-i-Tarkīb*, *Amrāḍ Sudda,* and *Amrāḍ Tafarruq Ittiṣāl,* which forms the basis of all renal diseases. The term *Ḍu'f al-Kulya* is used to describe deranged kidney functions resulting in *Bawl-i-ghusālī* (proteinuria). This paper is an attempt to understand the ancient Unani pathophysiological concept of CKD to find an alternative solution to the problem.

Keywords: *Bawl-i-ghusālī, chronic kidney disease, Ḍu'f al-Kulya, unani medicine*

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Introduction

Unani medicine provides a comprehensive and holistic approach to disease management by emphasizing the balance of humors and considering the patient's mental, emotional, and physical well-being. Through individualized treatments, herbal remedies, regimental therapies, and lifestyle adjustments, Unani medicine seeks to restore balance and enhance the body's natural healing abilities. This integrative approach makes it an effective system for both preventing and managing a wide range of acute and chronic conditions. Chronic diseases are a leading cause of morbidity and mortality in India and other low-and middle-income countries. The chronic diseases account for 60% of all deaths worldwide. Eighty percent of chronic disease deaths worldwide occur in low-and middle-income countries.[1] In India, the projected number of deaths due to chronic disease was around 5.21 million in 2008 and is expected to rise to 7.63 million in 2020, i.e., 66.7% of all deaths.[2] Chronic kidney disease (CKD) is a worldwide public health problem characterized by a gradual loss of kidney function over a period of time (for more than 3 months to years). Globally, CKD is the 12th cause of death and the 17th cause of disability, respectively. The high-risk groups are patients with diabetes mellitus, hypertension, elderly people, and blood relatives of CKD.

Approximately 30% of patients with diabetes mellitus have diabetic nephropathy and with the growing number of diabetic patients and aging population, there is likely a parallel increase in CKD incidence.[3] CKD has no specific symptoms initially and may present with a general unwell feeling accompanied by reduced appetite. It is often diagnosed while screening high-risk group people with hypertension or diabetes or family history or when it leads to one of its recognized complications, such as cardiovascular disease or anemia. Loss of kidney function is generally detected as an increase in the serum creatinine or protein in the urine. Early diagnosis and treatment can often keep CKD from getting worse. If kidney disease progresses, it may eventually lead to kidney failure, which requires dialysis or a kidney transplant to save life.[4]

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Unani Concept

Unani physician *Buqrāṭ* (460-370 BC) was skilled in diagnosis through microscopic detail of urine analysis. *Jālīnūs* (Galen) (131-210 AD) recognized the kidney as the vital organ responsible for urine formation (Brenner, 2000). Urine formation starts from the liver which is considered "Kitchen house" of the body. In the process of digestion, the liver facilitates the conversion of chyme into blood with the help of water. After the completion of *Nuḍj* (metabolism) of chyme, three types of *fuḍlāt* (metabolic wastes), namely, *Raghwah* (foam), *Talchhat* (argols), and *Bawl* (urine), are produced. The kidney harvests nutrition from the blood coming down from the liver and absorbs water leaving behind urine for excretion.[5] The kidney being a vital organ has been supplied by five natural powers; four ordinary and one unique power for effective normal functioning. These natural powers are as follows:

1. *Quwwat-i-Jādhiba* (Absorptive power): This power absorbs *Khilṭe dam* (blood) and *Maiyat* (water/fluid) toward the kidney through natural forces
2. *Quwwat-i-Māsika* (Retentive power): This power holds *Khilṭe dam* (blood) and *Maiyāt* (water/fluid) for a limited time period to facilitate the action of *Quwwat-i-Hāḍima*
3. *Quwwat-i-Hāḍima* (Digestive power): This power enables the kidney to take up its nutrition from the enriched blood through *Istahalah* (metabolism)
4. *Quwwat-i-Mumaiyāzā* (Differentiation power): This is the unique power of the kidney which separates metabolic waste and discriminates between useful and harmful metabolites; holding back useful ones. This power of selective reabsorption may be responsible for ultrafiltration
5. *Quwwat-i-Dāfi'a* (Expulsive power): This power helps to expel out the metabolic waste (Urine) only through excretory organs.

When *Quwwat-i-Māsika* gets weak or altered *Khilṭe dam* (blood) and *Maiyāt* (water/fluid) pass as such without getting metabolized as they were not given sufficient time to undergo *Istaḥālah* (metabolism). Thus, skipping the action of *Quwwat-i-Hāḍima* takes place. When *Quwwat-i-Hāḍima* gets altered or weak, kidney cannot harvest its nutrition from the blood carrying nutrients along with water and waste matter. When *Quwwat-i-Mumaiyāzā* of the kidney gets altered or weak, it results in the loss of ability to differentiate between essential and toxic substances of metabolism. This ultimately leads to the excretion of valuable nutrients through urine leaving behind toxic substances in the body.[6]

Classification of Kidney Disease

Ancient physicians classified kidney disease into four major categories, namely, *Amrāḍ-i-Sū'-i-Mizāj*, *Amrāḍ-i-Sū'-i-Tarkīb*, *Amrāḍ-i-Sudda*, and *Amrāḍ-i-Tafarruq Ittiṣāl.*

Amrāḍ-i-Sū'-i-Mizāj

Normal *Mizāj* (temperament) of the kidney is *ḥār raṭab* (hot and moist). Any deviation from this innate *Mizāj* produces variable pathological conditions based on the type and extent of deviation. These are as follows:

i. *Sū'-i-Mizāj ḥār* (abnormal hot temperament), implies when the temperament of the kidney exceeds its normal hot temperament
ii. *Sū'-i-Mizāj bārid* (abnormal cold temperament), normally, the kidney does not have the cold temperament, but having a comparatively lesser degree of hotness than normal physiological temperament is considered cold, in certain diseased conditions
iii. *Sū'-i-Mizāj raṭab* (abnormal moist temperament), normal temperament of the kidney is moist also, which when exceeds turns into disease
iv. *Sū'-i-Mizāj yābis* (abnormal dry temperament), implies when the kidney acquires dryness, thereby deviating from its normal moist temperament resulting in a pathological state.[7,8]

Amrāḍ-i-Sū'-i-Tarkīb

This pathological condition results in the malformation of the kidney. It occurs due to three basic abnormalities, namely, *amrāḍ-i-khilqat* (structural anomalies), *amrāḍ-i-miqdār-wa-'adad* (deformity in size and number), and *amrāḍ-i-waḍ'* (deformity in arrangement of kidney).[8]

Amrāḍ-i-Sudda

Sudda is an obstruction, affecting any part of the kidney mostly ducts, tubules, and vessels. The narrow path may be occluded due to stones, blood clots, abnormal growth, tumors, etc., producing disease in the kidney.[8]

Amrāḍ-i-Tafarruq Ittiṣāl

This is an acquired pathological condition of the kidney arising from a tissue injury following trauma, wound, rupture of blood vessels, etc., resulting in loss of continuity of the organ. The deformities, sometimes, occur in the body of the kidney and sometimes in its tubules.[8]

Ḍu'f al-Kulya

Ḍu'f al-Kulya is an important kidney disease mentioned in Unani literature, which occurs primarily due to one of the *Sū'-i-Mizāj* mentioned above. The pathology occurs in the muscular part of the kidney, which is mainly responsible for the absorption and filtration of the blood. The vessels, ducts, and pores get dilated due to which reabsorption and filtration of blood does not occur properly. The filtrate contains blood stains and nutritious matter, and urine appears like *ghusālāh* (wash of meat). *Ghusālāh* is the urine-containing red blood cells, proteins, casts, and other abnormal constituents. These constituents cross the filtration barrier, due to the weakness and large-sized pores of the kidney vessels. When albumin (*Bawl zulālī*) does not reabsorb or is not separated by the kidney, then it starts

appearing in the urine and in this condition, the body swells up.[8] Majūsī stated that blood-stained micturition occurs due to the weakness of *Quwwat-i-mumaiyāzā*. Sometimes, it may be due to the weakness of *Quwwat-i-Māsika*. The third reason is the expansion of the narrow vessels or dilation of the pores of the barrier, which filter the blood. As a result, a large volume of urine passes out mixed with blood.

In general, there is no pain while urination but sometimes patient may feel mild pain.[9] Razi states that *Ḍu'f al-Kulya* is a pathological condition, in which kidneys are unable to separate water and other substances from the blood and pass it out as such into the urinary bladder resulting in the excretion of a dilute protein containing urine.[10] IbnSina states that *Ḍu'f al-Kulya* is a disease, in which kidney function either decreases or collapses due to which the separation of water and other substances from the blood gets affected. According to Jeelani in *Ḍu'f al-Kulya* not only does the kidney function associated with metabolism and absorption of *Māiyāt* (water or fluid) get deranged, but also the filtration mechanism as well, resulting in highly colored urine-containing protein or albumin (*Bawl-i-ghusālī or Bawl-i-zulālī*).[8] It is evident from the above statements that ancient Unani scholars have been aware of kidney disease since antiquity. They not only diagnosed the disease but also successfully treated such cases.

Etiological Factors

Unani scholars mentioned in great detail several causative and risk factors which are involved in the development of kidney disease. These are old age, heavy weight lifting, excessive coitus, excessive fatigue, excess horse riding, excess of long journeys, renal trauma, excessive use of diuretics, and more fluid for filtration than the handling capacity of the kidney.[5,8,11]

Clinical Features

Scanty but frequent micturition, general weakness, loss of appetite, loss of weight, loss of libido, backache, proteinuria or *Bawl-i-ghusālī*, concentrated urine with *rasūb-i-laḥmī*, headache, reduced vision, dull complexion, cold lower extremity and back, swelling over face and limbs, indigestion, flatulence, nausea, and vomiting.[5,8,11]

Unani Pathology

Unani scholars attributed the following pathological changes in *Ḍu'f al-Kulya* for the deterioration of renal functions.[6-8,10,12,13] *Sū'-i-Mizāj ḥār Musteḥkam* (stable and hot derangement in the temperament) of kidney

1. *Amrāḍ-i-Sū'-i-Tarkīb* (deformity in shape and size) of kidney making it soft or loose in consistency and enlarged in size
2. *Amrāḍ-i-sudda Majārī* (urinary tract deformity or obstruction) causing dilatation and hypertrophy of renal tubules, vessels, and capillaries
3. Weakness either in *Quwwat-i-Jādhiba*, or *Quwwat-i-Māsika*, or *Quwwat-i-Hāḍima* or *Quwwat-i-Mumaiyāzā* of kidney
4. *Ijtima'-i-qiwām-ī-gurda* (deposition of the renal matrix): It is noticeable that the majority of Unani scholars considered dilatation and hypertrophy of renal tubules and capillaries, deposition of the renal matrix, an excessive quantity of fluid entering the kidney, soft and enlarged kidney mass as principle pathological changes in *Ḍu'f al-Kulya*. Clearly, these changes are found in accordance with modern pathology, namely, glomerular hypertrophy, hyperfiltration, and increase of mesangial matrix involved in nephropathy.[6-8,10,12,13]

Unani Principles of Treatment

Sū'-i-Mizāj ḥār gurda is the most common cause of *Ḍu'f al-Kulya.* The Unani principles for the treatment of *Ḍu'f al-Kulya* are as follows:

1. *Ta'dīl-i-Mizāj* with *bārid advia wa tadabeer* (restoration of normal temperament with drugs and procedures having cold properties)
2. *Muzīqāt wa mugharriyat adwiya* (constrictive and glutinous drugs)
3. *Qābiḍ-ḥābis adwiya wa aghzia* (astringent, styptic drugs and diet)
4. *Taqviyat-i-kulya* with *muqawwiyāt-i-gurda* (strengthening of renal power with renal tonics)
5. *Taqlīl-i-ḥarkat-i-badanī wa istifrāgh* (reduction in the body movements and evacuation).[5,11]

Adwiya-i-Mufrada/Single Drugs in Kidney Disease

In classical Unani literature commonly prescribed single or raw herbs for the treatment of kidney disease are as follows:

Ālu bālu *(Prunus cerasus*), Mako *(Solanum nigrum*), Afyūn *(Papaver somniferum*), Ajwain khurāsānī *(Hyoscyamus niger*), Badiyān *(Foeniculum vulgare*), Behman surkh *(Salvia haematodes*), Behman safaid *(Centaurea behen*), Beikh-i-Anjbaar *(Polygonum bistorta*), Bihīdāna *(Cydonia oblonga*), Chāksū *(Cassia absus*), Darṣīnī *(Cinnamomum zeylinicum*), Dūqū *(Peucedamum grande*), Dam-al-Akhwain *(Pterocarpus marsupium*), Filfil siyāh *(Piper nigrum*), Gul-i-Surkh *(Rosa Damascus*), Gul-i-Tesū *(Butea frundousa*), Gulnar *(Punica granatum*), Ḥab-al-Qilt *(Dolichos biflorus*), Ḥiltīt *(Ferula foetida*), Isapghol *(Plantago ovate*), Juft-i-Baloot *(Quercus incana*), Kāfūr *(Cinamomum camphora*), Kāknaj *(Physalis alkekengi*), Kundur *(Boswellia serrata*), Maghz-i-Bādām *(Prunus amygdalus*), Maghz-i-Chilghoza *(Pinus gerardiana*), Maghz-i-Pambadāna *(Gossypium herbaceum*), Maghz-i-Pista *(Pistacia vera*), Maghz-i-Tukhm-i-Kadū *(Cucurbita moschata*), Maghz-i-Tukhm-i-Tarbūz *(Citrullus vulgaris*), Maghz Tukhm-i-Kharpaza *(Cucumis melo*), Parsiāoshāṉ *(Adiantum capillus*), Raivand

ṣīnī *(Rheum emodi)*, Samagh-i-Arabi *(Acacia arabica)*, Salājīt *(Black asphalt)*, Ṣandal safaid *(Santalum album)*, Sat-i-Gilo *(Tinospora cordifolia)*, Shib-i-Yamānī (Aluminum sulfate), Tukhm-i-Ḥulba *(Trigonella foenum-graecum)*, Tukhm-i-Kāhū *(Lactuca sativa)*, Tukhm-i-Karafs *(Apium graveolens)*, Tukhm-i-Kāsnī *(Cichorium intybus)*, Tukhm-i-Kathūth *(Cuscuta reflexa)*, Tukhm-i-Katāṉ *(Linum usitatissimum)*, Tukhm-i-Khurfa *(Portulaca oleracea)*, 'Unnāb *(Zizyphus vulgaris)*, Zardchob *(Curcuma longa)*, Zanjabīl *(Zingiber officinale)*.[5,11,12]

Adwiya-i-murakkaba (Compound Formulations) in Kidney Disease

Numerous compound formulations were made and used in treatment of kidney disease by the ancient Unani scholars. Some of them are as follows:

*Jawārish Zar'ūnī Sāda (*JZS*)*, *Jawārish Zar'ūnī 'Anbarī Banuskha Kalāṉ*, *Jawārish Jālīnūs*, *Ma'jūn Falāsfa*, *Ma'jūn 'Aqrab*, *Ma'jūn Kundur*, *Ma'jūn Masikul Baul*, *Ma'jūn Sange Sarmahi*, *Ma'jūn Zafran*, *Ma'jūn Fanjnūsh*, *Sharbat Bazūrī*, *Sharbate Annanas*, *Sharbate Ālū bālū*, *Qurṣ Kushta Ṣadaf*, *Qurṣ Kushta Khabsul Hadeed*, *Qurṣ Kushta Qalai*, *Qurṣ Ziabetus*, *Qurṣ Tabasheer*, *Qurṣ Afawiya*, *Qurṣ Kaknaj*, *Qurṣ Kuharba*, *Roghan Akhrot*, *Roghan Badam*, *Roghan Balsan*, *Roghan Gul*, *Roghan 'Aqrab*, *Roghan Bābūna*, *Dawa' al Kurkum*, *Labūb Ṣaghīr*, *Labūb Kabir*, *Kushta 'Aqīq*, *Kushta Faulad*, *Kushta Ḥajr al-Yahūd*, *Kushta Baiḍa Murgh*, *Kushta Zamarrud*, *Sufūf Ziabītus*, *Safoof Hindi*, *Arqe Badiyan*, *Halwae Maghz Sar Kunjushk*, *Ḥabb-i-Mudir*, *Banādiq al-Buzūr*, *Nuqu' al Buzūr*, *Amrūsiya*, *Athānāthiya Saghīr*, *Athānāthiya Kabīr.*[5,11,12]

Evidence-based Research Studies

1. JZS: Afzal *et al.* 2004 reported that polyherbal Unani formulation (PUF) JZS showed significant diuretic and nephroprotective effect against gentamicin (40 mg/kg)-induced nephrotoxicity at the dose of 300 mg/kg body weight in albino rats[14]
2. PUF: Ansari, 2020 reported that PUF showed a significant response in the treatment of albuminuria in diabetic nephropathy, as compared to the control drug (Ramipril). No side effects or toxicity was seen during and after the trial[15]
3. Unani Herbal Preparations: Siddiqui and Usmanghani reported in a case study that Unani preparations, namely, *Ma'jūn Musaffi Khas*, *Qurṣ Rasawt*, *Qurṣ Pudina*, *Habb e Ṣibr*, *Iṭrifal Kishnīzī*, *Ḥabb-i-Fishār,* and JZS*,* have resolved acute kidney injury within 20 days as analyzed by the BUN, serum creatinine, and 24 h serum creatinine clearance levels[16]
4. Coded Unani drug AJMAL06: Siddiqui *et al.* 2016 reported that polyherbal-coded Unani formulation AJMAL06 was effective in the treatment of CRF with a significant *P* value[17]
5. *Kabab Chini (Piper cubeba):* Ahmad *et al*. reported that Kabāb Ṣīnī powder exhibits a significant nephroprotective effect against gentamicin-induced nephrotoxicity at the dose of 810 and 1220 mg/kg in suspension form, in pretreated and posttreated rat models[18]
6. Gul-i-Surkh and Beikh Kāsnī (*Rosa damascena* and *Cichorium intybus*): Khaliq *et al*. 2015 reported that aqueous extract of *Rosa damascena* (250 and 500 mg/kg), *Cichorium intybus* (250 and 500 mg/kg), and their mixture (250 and 500 mg/kg) revealed nephroprotective activity against gentamicin (80 mg/kg)-induced nephrotoxicity in albino rabbits[19]
7. *Tūt Siyāh* (*Morus alba*): Muhammad *et al*. 2014 reported that hydroalcoholic extract of *Morus alba* L.(400 and 800 mg/kg) exhibits significant nephroprotective effects against Isoniazid (INH) (100 mg/kg/day) induced nephrotoxicity in albino rabbits.[20]

Conclusion

It is evident from the review of ancient Unani literature on kidney disease that there is enough resemblance between pathological changes described by ancient scholars and the pathology at present. Therefore, the management employed in ancient times must be explored further for its validity in the current scenario, thereby finding an alternative solution of the problem.

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Conflicts of interest

There are no conflicts of interest.

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Review Article

Does Touch Belong to Skin?

Abstract

The sensation of touch, or skin, is regarded as the fifth sense organ. The fundamental stage is when the sense organs – the eye, ear, nose, tongue, and skin – are initially presented. In secondary education, the skin is taught descriptively as the fifth sense organ. The largest organ is the skin, according to standard physiology textbooks such as Guyton and Hall and Sembulingam, which are frequently studied in graduating. Many physiology and dermatology publications consider the skin as the biggest organ in the body. It is thought to act as a wall separating the interior organs from the outside world. The skin is the organ responsible for the human sensation of touch. It is the largest sense organ since, in contrast to the others, it is found across the entire body rather than just one location. The dermis, the skin's lowest layer, communicates with the brain about feelings such as pain, heat, cold, or the feeling of objects that are sticky, soft, or sharp. However, are sensations of touch, pain, and even warmth limited to the skin alone? Can an organ or structure, such as the tongue, the eye, and the inner membranes, be blind to pain, touch, or temperature? And if they are able to, do they enter the skin's confines? These are a few of the queries that this paper will be focusing on.

Keywords: *Questions, sensations, skin, touch*

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Introduction

The touch is closely related to the skin, as the skin is the main organ responsible for the sense of touch. The skin has specialized sensory receptors called mechanoreceptors, which detect dissimilar types of tactile stimuli, such as pressure, temperature, vibration, and pain. Touch literally means "come into or be in contact with."[1] It literally means to bring a bodily part into contact with especially so as to perceive through the tactile sense: handle or feel gently usually with the intent to understand or appreciate.[2,3] Touch is the first sense developed in the womb (during 8–14 weeks of gestation) and the last sense used before death. With 50 touch receptors for every square centimeter and about 5 million sensory cells overall, the skin is very sensitive and is the largest and one of the most complex organs in our bodies. Touch is important in several domains of life across the lifespan, particularly in early life. Touch helps us learn about the world around us and plays an integral role in biological, cognitive, and social development. There are eight basic sensations that skin can detect, which are: cold and hot, dry and wet, soft and hard, and rough and smooth. The touch receptors are grouped by type and include mechanoreceptors (sensitive to pressure, vibration, and slip), thermoreceptors (sensitive to changes in temperature), and nociceptors (responsible for pain).[4]

Sense of Touch

Touch is a proximal sense, i.e. the things close to us or in contact with us can be felt with some exceptions, e.g., heat radiation and deep bass tones. Furthermore, touch can be sensed remotely with special tools e.g., a white cane provides vibratory and pressure information for a blind). The sense of touch covers all major parts of our body. Compared to other major senses, many things related to touch remain unknown. Touch is often considered to be one of the five human senses defined by Aristotle. However, when a person touches various feelings from pressure to temperature and pain are evoked. Thus, the term "touch" is actually a combined term for several sub-modalities. In medicine, touch is usually replaced with the term somatic senses to better reflect the variety of sensory mechanisms involved. The senses of touch are mediated by the somatosensory system.[5]

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The Little Man Inside the Brain, Sensory Homunculus for Touch

It visualizes the proportional sensory perception mapping of the body surfaces in the brain. Lips, tongue, hands, feet, and genitals are considerably more sensitive than other parts of the body.[6,7]

Skin

The largest and heaviest organ in the human body (~1.8 m^2, 4 kg), viscoelastic tissue (stretches and maintains its shape), protects the body from dehydration and physical injury, regulates body temperature and blood pressure, and contains structures responsible for the ability to feel. When we feel embarrassed, touched, self-conscious, or angry, we often feel it directly as a charge at the skin level. Psychological characteristics of the openness of skin may be vulnerability, pleasure, or excitement.[8]

Layers of the Skin

1. Epidermis (0.15–1.5 mm): outermost protective layer, renews fast, contains, e.g., pigment cells and keratin
2. Dermis (0.3–3.0 mm): beneath the epidermis, contains, e.g., most of the skin receptors, nerve endings, and capillaries
3. Subcutaneous tissue (thickness varies greatly): for insulation and storage of energy, contains, e.g., fat, nerves, and larger blood vessels.[9]

Processing of Touch

Touch or tactile perception is processed through the somatosensory system. This system is comprised sensory receptors, peripheral sensory neurons, and brain cells. When there is pressure on the skin, the peripheral touch receptors send information to the brain through the somatosensory pathway, which is usually comprised three long neurons. The touch receptors in the periphery are known as mechanoreceptors. The afferent neurons send the information to the central nervous system of the brain for processing and interpretation. Meanwhile, the somatosensory system in the spinal cord has ascending pathways that send the information about the stimulus applied on the body's trunk toward the brain. In the brain, touch sensation is processed in the primary somatic sensory cortex or SI and situated in the parietal lobe's postcentral gyrus.[10]

Somatosensory System

The somatosensory system is a part of the sensory nervous system. The somatosensory system is a complex system of sensory neurons and pathways that responds to changes at the surface or inside the body. The axons (as afferent nerve fibers) of sensory neurons connect with or respond to various receptor cells. These sensory receptor cells are activated by different stimuli such as heat and nociception, giving a functional name to the responding sensory neuron, such as thermos-receptors which carry information about temperature changes. Other types include mechanoreceptors, chemoreceptors, and nociceptors which send signals along a sensory nerve to the spinal cord where they may be processed by other sensory neurons and then relayed to the brain for further processing. Sensory receptors are found all over the body including the skin, epithelial tissues, muscles, bones and joints, internal organs, and the cardiovascular system.[11]

Therefore, the somatosensory system is a sensory system associated with the body and concerned with sensory information from the skin, joints, muscles, and internal organs. The sensory information is highly sensitive to temperature. Three main modalities are there: discriminative touch, temperature, and pain, and the kinesthetic senses tactile/cutaneous proprioception.

Each somatosensory modality has its own receptors or nerve endings. The basic function of the somatosensory pathway in short is:

1. If a stimulus is larger than the threshold of the receptor, a response is triggered
2. Electrical discharge is carried by the afferents to the peripheral nerves
3. Impulses travel through the spinal cord to the brain
4. The sensations are registered in the somatosensory cortex in the brain. The greater the stimulus the more the receptor discharges and the larger amount of receptors discharge.[12,13]

Receptor Classifications

Location-based classification is as follows:

1. Skin receptors (exteroceptors) are located close to the skin surface (e.g., touchpressure, vibration, temperature, and pain)
2. Muscle and joint receptors (proprioceptors) are located in tendons, muscles, and joints (e.g., position and movement)
3. Visceral receptors (interoceptors) are associated with the internal organs (e.g., heart rate and blood pressure).[14]

Transduction mechanism-based classification is as follows:

1. Mechanoreceptors are responsive to any kind of mechanical deformation
2. Thermoreceptors are responsive to changes in temperature
3. Chemoreceptors are responsive to substances produced within the skin
4. Nociceptors are specialized for detecting painful stimuli.[10,15]

Mechanoreceptors

Tactile sensations are experienced with the entire skin surface – Different areas of skin have different qualities (e.g., hairy skin has a "soft touch" channel that is found

to be associated with emotions). Tactile sensing plays an important role in object discrimination and manipulation contact detection (pressure), surface texture (vibration and skin deformation), and tool manipulation (pressure, vibration, and skin deformation). The receptors function optimally with light contact. Skin receptors are divided into two categories based on their speed of adaptation – (1) Slowly adapting (SA) receptors detect a constant stimulus (e.g., pressure and skin stretch) and (2) Rapidly adapting (RA) ones detect only short pulses (e.g., initial contact and vibration). Mechanoreceptors have different spatial resolutions – Spatial resolution depends on the location of the skin (i.e., what and how many receptors are found in the locus). Type I receptors have a large receptive field (low spatial resolution); Type II receptors have a small receptive field (good resolution).[16]

Pain and Temperature

The pain and temperature system does not have specialized receptor organs. The changes in the body state are perceived through free nerve endings found throughout skin, muscles, bones, and tissues. Most pain is a result of chemical substances released by damaged tissues.

- Temperature receptors (thermoreceptors): Around 30 cold receptors per one hot receptor. Warm receptors are maximally responsive at 45°C, and cold receptors at 27°C. More responsive to a change in temperature than to a constant temperature
- Pain receptors (nociceptors): Nerve endings sensitive to mechanical, thermal, or chemical stimuli. Provide highly important information for avoiding accidents.[17]

Proprioception

From Latin *proprius*, one's own perception. The reception of stimuli produced within the organism. An interceptive sense provides feedback on the internal status of the body, e.g., stretch receptors within muscles (with both RA and SA components), receptors to monitor tensions, and forces at the tendons and joints. A key component in muscle memory and hand–eye coordination is a highly trainable sense mediated by receptors located in muscles, tendons, and joints stimulated by bodily movements and tensions. Receptors register different kinds of information – cutaneous mechanoreceptors (skin stretch), muscle spindles (muscle stretch), Golgi tendon organs (tendon stretch), and joint receptors (joint stretch).[18]

Distribution of Receptors in the Body

1. Special senses: Mediated by relatively complex sense organs of the head, innervated by cranial nerves, e.g. vision, hearing, equilibrium, taste, and smell
2. General (somesthetic and somatosensory): Receptors widely distributed in skin, muscles, tendons, joints, and viscera. They detect touch, pressure, stretch, heat, cold and pain, blood pressure.[12,18]

General Senses Skin receptors

Our skin and deeper tissues contain millions of sensory receptors. Most of the touch receptors sit close to the skin's surface. Touch receptors sense fine touch. Meissner's corpuscles are enclosed in a capsule of connective tissue. They react to light touch and are located in the skin of our palms, soles, lips, eyelids, external genitals, and nipples. These areas of our body are particularly sensitive. Merkel disks are found deep at the junction of the epidermis and dermis. Root hair plexus at the base of the hair follicle.[13,19]

Pressure Receptors

Pacinian corpuscles sense pressure and vibration changes deep in the skin. Every square centimeter of the skin contains around 14 pressure receptors. Pacinian corpuscles are deep pressure sensors, onion-shaped capsules (layers of Schwann cells enclosed in a connective tissue membrane), that respond to on–off pressure or vibration. Ruffini's endings and Krause's end bulbs are encapsulated pressure sensors, and the dermis (and elsewhere) respond to continuous pressure.[20]

Pain Receptors

Skin receptors register pain. Pain receptors are the most numerous. Each square centimeter of the skin contains around 200 pain receptors.[21]

Temperature Receptors

Skin receptors register warmth and cold. Each square centimeter of the skin contains 6 receptors for cold and 1 receptor for warmth. Cold receptors start to perceive cold sensations when the surface of the skin drops below 95°F. They are most stimulated when the surface of the skin is at 77°F and are no longer stimulated when the surface of the skin drops below 41°F. This is why the feet or hands start to go numb when they are submerged in icy water for a long period of time. Hot receptors start to perceive hot sensations when the surface of the skin rises above 86°F and are most stimulated at 113°F. Beyond 113°F, pain receptors take over to avoid damage being done to the skin and underlying tissues. Thermoreceptors are found all over the body, but cold receptors are found in greater density than heat receptors – most of the time the environment is colder than the body temperature. The highest concentration of thermoreceptors can be found in the face and ears so our nose and ears always get colder faster than the rest of our body on a chilly winter day.[22]

Proprioceptors

Stretch receptors are located in joints, ligaments, and tendons (respond to either stretch or compression). Maintain some degree of continuous contraction (partial sustained contraction) or muscle tone. Muscle spindles – modified muscle fibers with sensory nerve endings wrapped around

the middle (and also found at the ends) detect stretch and stimulate a reflex contraction.[23]

Pain Receptors (Nociceptors)

Somatic nociceptors – from skin and skeletal muscle. Visceral nociceptors – receptors that help maintain internal homeostasis, respond to stretch, lack of O_2, chemicals released from damaged cells and inflammatory cells.[24]

Where is a Sense of Touch Found?

If it is asked to explain the sense of touch, it would probably be described as the ability to feel things with our fingers. However, in reality, the sense of touch is much more.

The human body contains special nerve endings called sensory receptors that enable us to "feel" things. These receptors are not located only in the skin. They're also found in muscles, joints, blood vessels, and internal organs. Sensory receptors respond to light touch, pressure, stretching, warmth, cold, pain, and vibration. Taken together, they make an arsenal of equipment that lets people react to both the inner world and the world around them.

The best way to identify something without looking at it is to use your fingers. Light touch and pressure receptors, which are located in the dermis, or middle layer of skin, are the ones that make this possible. These receptors are highly responsive to edges and fine details. Not surprisingly, more of them are there in the fingertips and lips than the arms and legs. Hair does not contain nerve endings. However, hair follicles, which are located in the dermis, are surrounded by touch receptors. That is why it can be felt if someone or something touches the hair. Stretch receptors are located in our dermis, muscles, and joints. Input from these sensors provides information that is essential for gripping and releasing objects. When a ball is thrown, it needs to be grabbed hard enough so as to not get it dropped, it needs to be released carefully as well and at the right moment. If it is not known where the arms and joints are at any given moment, the ball could end up in someone's gutter rather than a friend's hands. Stretch receptors in our lungs tell when a full breath is taken. The ones in the stomach help us recognize when it is "full." Stretch receptors in the rectum and bladder tell when it is time to visit the bathroom.

Pressure receptors in the arteries enable the brain to monitor and control blood pressure.

Because humans are endothermic (warm-blooded), the brain needs to monitor the core and skin temperature. Warmth and cold receptors are located in the dermis, skeletal muscles, liver, and an area of the brain known as the hypothalamus. The hypothalamus controls many automatic bodily functions such as hunger, the fight-or-flight response, and temperature regulation. *Receptors that transmit pain are located throughout the body. The ones that transmit superficial pain, such as a pinprick, are in the dermis.* The brain does not contain pain nerves. If there is a headache, it is not because the brain hurts. Rather, the pain is coming from the skull or internal structures that surround and support the brain. It might also be coming from the muscles in our scalp, the skin that covers our head.[7,15]

Sense of Touch in Other Sense Organs?

Tongue

The tongue is an extremely movable set of muscles, which is well-supplied with blood and has many nerves. The tongue muscles have an oblong shape and are covered with a dense layer of connective tissue. Above this layer, a special kind of mucous membrane makes up the surface of the tongue. The tip of the tongue is the part of the body that is most sensitive to touch. This fine sensitivity to touch has two main tasks: on the one hand, it tests the mechanical characteristics of the food. This high level of sensitivity is the reason why small stones, bone splinters, or fish bones feel much larger than they really are. This magnifying effect of the tongue protects us. On the other hand, the tongue searches the entire mouth for the remaining rest of the food after the first bite. Therefore, the tongue is a sensory organ responsible for tasting as well as the most sensitive place for our sense of touch.[25]

Eyes

The cornea is the body tissue with the highest spatial concentration of the tactile sensors. It is densely innervated with sensory nerve fibers through the ophthalmic division of the trigeminal nerve by way of 70–80 long ciliary nerves and short ciliary nerves derived from the oculomotor nerve. These nerves are distinct from the optic nerve which transmits only vision signals. The nerves enter the cornea at three levels: scleral, episcleral, and conjunctival. Most of the bundles give rise by subdivision to a network in the stroma, from which fibers supply the different regions. Corneal nerves of the subepithelial layer terminate near the superficial epithelial layer of the cornea in a logarithmic spiral pattern. The nerves' density of the corneal epithelium is 300–600 times larger than that of skin. Most of these nerves are sensory producing touch, thermal, and chemical sensations, mostly manifested as pain. Therefore, the cornea is also sensitive to tactile sensation, i.e. sensitive to touch.[26]

Conclusion

We can now say that both tongue and eyes (specifically cornea) are sensitive to touch. In fact, the nerve density of the cornea is even more than that of the skin. The tongue does not come under the confinement of skin as the tongue is a mass of interlacing skeletal muscle, connective tissue with some mucous and serous glands, and pockets

of adipose tissue, covered in oral mucosa. Similarly, the cornea is the transparent front part of the eye that covers the iris, pupil, and anterior chamber and it is also not structurally similar to skin as well. However, the cornea, as well, is sensitive to tactile sensation. Therefore, a sense of touch can not only be confined to the skin.

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Conflicts of interest

There are no conflicts of interest.

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Original Research Article

Safety Study of *Nardostachys jatamansi* (D.Don) DC. (*Sumbul al-Ṭīb*)

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Abstract

Background: Herbal drugs are a key component of the Unani system of medicine, widely used in the prevention and treatment of various ailments. With 70%-80% of the global population relying on traditional medicine, as reported by the World Health Organization (WHO), there is growing interest and concurrent concern regarding the safety of herbal products. Despite the common assumption that "natural" equates to "safe," cases of toxicity and adverse effects underscore the need for rigorous safety assessments. According to the WHO guidelines, safety studies on herbal drugs and food items are now essential, focusing on contaminants from environmental sources such as soil and water. **Aims and Objectives:** This study aimed to evaluate the safety of Sumbul al-Ṭīb (*Nardostachys jatamansi* [D. Don] DC.), a traditional remedy from the family Valerianaceae. **Material and Methods:** We assessed safety parameters, including microbial load, heavy metals, aflatoxins, and pesticide residues. **Results:** The findings indicated that the levels of heavy metals (lead, cadmium, mercury, and arsenic) were within permissible limits as per the WHO standards. In addition, aflatoxins, pesticides, and microbial contamination were undetectable in the crude drug sample. **Conclusion:** The observations indicate that Sumbul *al-Ṭīb* is free from significant toxicity risk.

Keywords: *Heavy metals, pesticide residues, safety study, Sumbul al-Ṭīb, World Health Organization Guidelines*

Introduction

Sumbul al-Ṭīb (*Nardostachys jatamansi* [D. Don] DC.), commonly known as *Jatamansi,* is a small perennial, rhizomatous herb which grows in steep, moist, rocky, undisturbed grassy slopes of India, Nepal, China, and Bhutan from 2300 m to 6000 m above the sea level. The long sessile and oblong-ovate leaves are 15–20 cm in length. The flowers are slightly blue or pink in dense cymes. The root of this taxon consists of short, thick, dark gray rhizomes crowned with reddish brown tufted fibrous remains of the petioles of the radical leaves. Its rhizomes are used in traditional medicines in different medicinal system. It is used as a good stimulant,[1] antispasmodic, tonic, laxative, and antiepileptic.[2-4]

Sumbul al-Ṭīb (*Jatamānsi*) has been traditionally used in the treatment of wide range of disorders, which include digestive system, circulatory system, nervous system, respiratory system, urinary system, reproductive system, and skin diseases. It also shows marked tranquillizing activity, hypotensive, hepatoprotective, neuroprotective, antiischemic, antiarrhythmic and anticonvulsant activities,[5,6] and diuretic.[7] It possesses anti-inflammatory, sedative/anodyne, detergent, sialagogue, desiccant, carminative, cardiac tonic, brain tonic, diuretic properties and can be used in cephalalgia, flatulence, ascites, jaundice, hepatitis, ureteralgia, cystitis, etc.[8]

The roots and rhizomes of *Sumbul al-Ṭīb* (*N. jatamansi*) have been used to treat hysteria, syncope epilepsy, and mental weakness. It also exhibits cardioprotective activity and used in the treatment of neural diseases. The essential oil obtained from the roots shows various pharmacological activities including antimicrobial, antifungal, hypotensive, anti-arrhythmic, and anticonvulsant activity. Sesquiterpene is the major component of *N. jatamansi* plant and includes jatamansone and nardostachone.[9]

Herbs normally carry a large number of bacteria and molds, often originating in soil or derived from manure. Current practices of harvesting, production may cause additional contamination and microbial growth of microorganism failure to control the moisture level of herbal

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medicines during transportation and storage.[8] Aflatoxins (AFs) are naturally occurring mycotoxins that are produced principally by the strains of *Aspergillus flavus, Aspergillus parasiticus*, and by some other species like *Aspergillus nomius*, *Aspergillus ochraceoroseus*, *Aspergillus bombycis*, and *Aspergillus pseudotamari*. The four major AFs B1, G1, B2, and G2 are fungal secondary toxic metabolites. AFs are the strongest natural carcinogens and their main target organ is liver. AF B1 is the most potent natural carcinogen known. The International Agency for Research on Cancer (IARC) has classified AF B1 as Group I carcinogen. Ingestion of contaminated herbal plants and herbal medicines is regarded as a potential source of heavy metal toxicity. Heavy metals are released into the environment by both natural and variety of anthropogenic sources. The presence of heavy metals in plant tissues is primarily dependent on their availability and concentration in the soil. They can also be directly deposited on the plant surface from the atmosphere. Heavy metals are persistent in nature due to their long biological half-life. The major heavy metals of health concern are arsenic, cadmium, lead, and mercury. Cultivation and collection of medicinal plants in the immediate vicinity of industrial area which utilizes these metals and area where these metals have been improperly disposed is highly discouraged because plants from these areas are prone to high concentration of heavy metals, hence increase the risk of contamination when taken.[1,10]

With this preview, the present study was conducted to assess the microbial load and safety study on *N. jatamansi* was conducted.

Materials and Methods

Collection and identification of test drug

The test drug, *Sumbul al-Ṭīb* (*N. jatamansi*), was collected from Dawakhana Tibbiya College, Muslim University Aligarh, U. P., India. The rhizome of *Sumbul al-Ṭīb*, a member of the *Valerianaceae* family, was confirmed in the pharmacognosy section of the Department of Ilmul Advia, A.K.T.C, and the Botany Department of A.M.U, Aligarh, according to both botanical and Unani literature.[1,2] The identification was subsequently validated at the National Institute of Science Communication and Information Resources (NISCAIR, CSIR), New Delhi. A herbarium sample of the test drug was prepared and submitted to the *Mawalid-e-Thalātha Museum* of the Department of Ilmul Advia, A.K.T.C, A.M.U, Aligarh, for further reference (Voucher No. SC-0224/17; NISCAIR reference: NISCAIR/RHMD/Consult/2018/3258-59-1). The drug was powdered and stored in an airtight container for experimental studies.

Microbial load determination

Microbial load was assessed as mandated for all herbal drugs, in accordance with the World Health Organization (WHO) guidelines.[11,12]

Sample preparation

To prepare the test samples, the following methods were employed based on the nature of the material:

1. For water-soluble materials: 10 g of the test sample was dissolved in lactose broth, proven to have no bacterial activity. The suspension's volume was adjusted to 100 mL, and the pH was maintained at 7.0[4]
2. For nonfatty materials insoluble in water: 10 g of the test sample was dissolved in lactose broth with the addition of a surfactant solution containing polysorbate 20R and 1 mg/mL of potassium tellurite.[3] The volume was similarly adjusted to 100 mL and pH set to 7.0.

Test procedures

Plate count for bacteria and fungi

- For bacteria, 1 mL of the pretreated sample was added to liquefied casein-soybean digest agar and incubated at 30°C–35°C for 48–72 h. The colonies were counted using plates with the highest count, up to a maximum of 300[13]
- For fungi, the procedure was similar using Sabouraud glucose agar, incubating at 20°C–25°C for 5 days, and counting colonies with no more than 100 colonies.[14]

Determination of heavy metals

The test for heavy metals aimed to assess contamination with metallic impurities such as arsenic, lead, mercury, and cadmium. This was performed following ASU guidelines via Atomic Absorption Spectroscopy (AAS) at Delhi Test House Pvt. Ltd.[15]

Aflatoxin estimation

For AF estimation, 2 g of the sample was blended with 20 mL of 60% acetonitrile/water, centrifuged, and the supernatant was diluted. The sample was then processed through an immunoaffinity column, with quantification conducted using liquid chromatography-mass spectrometry (LCMS/MS).[16,17]

Pesticide residue estimation

The analysis of pesticide residues involved extracting 2 g of the test drug in 5 mL of ethyl acetate, followed by centrifugation. The supernatant was injected into a gas chromatography-mass spectrometry (GCMS)/MS for detection.[7,18]

Results

- Microbial load: Total bacterial, yeast, and mold counts were within permissible limits, with no pathogenic bacteria detected [Table 1]
- Heavy metals: Lead was within acceptable limits, and mercury, arsenic, and cadmium were undetectable [Table 2]
- AFs: AFs B1, B2, G1, and G2 were absent [Table 3]
- Pesticide residues: Pesticide residues were within acceptable limits [Table 4].

Table 1: Microbiological test of *Sumbul al-Ṭīb* (*Nardostachys jatamansi*)

Parameters	Test result	LOQ	Permissible limit as per API
Total bacterial count (CFU/g)	3000	-	Not more than 1×10^5 CFU/g
Total yeast and mold (CFU/g)	100	-	Not more than 1×10^3 CFU/g
Any specific pathogens (/g)			
Escherichia coli	Absent	-	Absent
Salmonella	Absent	-	Absent
Staphylococcus aureus	Absent	-	Absent
Pseudomonas aeruginosa	Absent	-	Absent

LOQ: Limit of quantification, API: Ayurvedic pharmacopoeia of India

Table 2: Heavy metal analysis of *Sumbul al-Ṭīb* (*Nardostachys Jatamansi*)

Test parameters (mg/kg)	Test result (mg/kg)	LOQ (mg/kg)	Permissible limits as per API
Lead as Pb	6.9	2.50	Not more than 10
Mercury as Hg	Not detected	0.5	Not more than 1
Arsenic as As	Not detected	1.25	Not more than 3
Cadmium as Cd	Not detected	0.25	Not more than 0.3

LOQ: Limit of quantification, API: Active Pharmaceutical Ingredient

Table 3: Test for aflatoxins in *Sumbul al-Ṭīb* (*Nardostachys Jatamansi*)

Aflatoxins	Results	LOQ	Permissible limit as per API
Aflatoxin B_1	Not detected	0.001	Not more than 0.5
Aflatoxin G_1	Not detected	0.001	Not more than 0.5
Aflatoxin B_2	Not detected	0.001	Not more than 0.1
Aflatoxin G_2	Not detected	0.001	Not more than 0.1

LOQ: Limit of quantification, API: Active Pharmaceutical Ingredient

Discussion

Safety study of herbal drugs and food item is now mandatory as per the WHO guidelines. It includes the determination of microbial load, heavy metals, AFs, and pesticide residues. The contamination of herbal drugs by microorganisms not only causes deterioration but also reduces the efficacy of herbal drugs. The toxins produced by microbes make herbal drugs unfit for human consumption because the contaminated drying may develop unwanted disease instead of disease being cured. Considerable interest therefore lies in investigation pertaining to the microbial contamination associated with drugs sample.[15] In the present study, herbal Unani drugs *Sumbul al-Ṭīb*, was analyzed for microbial load. It included determination of total bacterial count and total yeast and mold count. As per the WHO norms, the total bacterial count by serial dilution method was found to be within permissible limit in the drug sample. The specific pathogenic bacteria (*Enterobacteriacea*, *Escherichia coli*, *Salmonella* sp., *Pseudomonas aeruginosa,* and *Shigella*) were absent in the sample of test drugs. The result of the present study is summarized in Table 1.

The medicinal plants contain varying amounts of various heavy metals. They may be due to contamination or some plants absorb from atmosphere. These could be both essential and nonessential. The excess of trace metal can cause serious toxic effects on health. It is important to have good-quality control practice of herbal product and standardized extract screening to protect consumer from toxicity.[14] Heavy metal contamination of test drugs was determined by atomic absorption spectrometry method and was found to contain lead within permissible limits mercury, arsenic, and cadmium were absent [Table 2].

AFs are a group of mycotoxins that are produced mainly by the member of the genus *Aspergillus.* Production of these toxic secondary metabolites is closely related to fungal development.[16] Contamination of food, feed, and Kunle agriculture commodities by AFs possess enormous economic and serious health concern because these chemicals are highly carcinogenic and can directly influence the structure of DNA,[16] these are the strongest natural carcinogens and their main target organ is Liver. The IARC has classified AFs B_1 as carcinogenic and AF G1, B2, and G2 are possible carcinogens to humans.[18] AF B1, B2, G1, and G2 are highly contaminants in any material of plants origin, and thus screening of test drugs for AF was conducted by LCMS/MS showed that AF was absent in the test drug sample [Table 3].

Herbal drugs are liable to contain pesticide residue which accumulate from agriculture practice, such as spraying, treatment of soil during cultivation, and administration of fumigants during storage. However, it may be desirable to test herbal drugs for broad group in general, rather than for individual pesticide. Sample of herbal material were extracted by a standard procedure, impurities were removed by partition or absorption, and individual pesticides were measured by GCMS.[15] The pesticide residues for test drugs were showed within normal limits as summarized in Table 4.

Future scope

Safety profile helps in establishing the safety and toxicity of herbal drugs from contaminants like heavy metals, microbes, AFs, and pesticide residues.

Conclusion

The evaluation of safety parameters of all the natural drugs has been made mandatory by the WHO. Thus the safety

Table 4: Pesticide residues in *Sumbul al-Ṭīb* (*Nardostachys jatamansi*)

Pesticides residue (mg/kg)	Results	LOQ	Permissible limit as per API
Alachor	Not detected	0.02	0.02
Aldrin and Dieldrin (sum of)	Not detected	0.04	0.05
Azinophos-methyl	Not detected	0.04	1.0
Bromopropylate	Not detected	0.08	3.0
Chlordane (sum of cis, trans and oxychlordane)	Not detected	0.04	0.05
Chlorfenvinphos	Not detected	0.04	0.5
Chlorpyrifos	Not detected	0.04	0.2
Chlorpyrifos-methyl	Not Detected	0.04	0.1
Cypermethrin (and isomers)	Not detected	0.10	1.0
DDT (sum of p, p-DDT, p, p-DDE and p, p-TDE)	Not detected	0.04	1.0
Deltamethrin	Not detected	0.10	0.5
Diazinon	Not detected	0.04	0.5
Dichlorvos	Not detected	0.04	1.0
Dithiocarbametes (as CS2)	Not detected	0.01	2.0
Endosulfan (sum of isomer and Endosulfan sulphate)	Not detected	0.04	3.0
Endrin	Not detected	0.04	0.05
Ethion	Not detected	0.04	2.0
Fenitrothion	Not detected	0.04	0.5
Fenvalerate	Not detected	0.10	1.5
Fonofos	Not detected	0.04	0.05
Heptachlor (sum of heptachlor and heptachlor epoxide)	Not detected	0.04	0.05
Hexachlorobenzene	Not detected	0.04	0.1
Hexachlorocyclohexane isomer (other than γ)	Not detected	0.04	0.3
Lindane (γ-Hexachlorocyclohexane)	Not detected	0.04	0.6
Malathion	Not detected	0.04	1.0
Methidathion	Not detected	0.04	0.2
Parathion	Not detected	0.04	0.5
Parathion methyl	Not detected	0.04	0.2
Permethrin	Not detected	0.04	1.0
Phosalone	Not detected	0.04	0.1
Piperonyl butoxide	Not detected	0.04	3.0
Primiphos methyl	Not detected	0.04	4.0
Pyrethrins (sum of isomer)	Not detected	0.10	3.0
Quintozen (sum of quitozene pentachloroanilline and methyl pentachlorophenyl sulphide)	Not detected	0.10	1.0

LOQ: Limit of quantification, API: Active Pharmaceutical Ingredient

study of the test drug was conducted for determination of microbial load, heavy metal contamination, aflatoxins contamination and pesticidal residues if any. It was found that total bacterial and fungal count was with in the limit and other specific micro-organisms were absent. The heavy metals cadmium, mercury and arsenic were absent while lead was with in permissible limit, aflatoxins were absent and pesticidal residues were not detected. Hence, it can be concluded that the test drug Nardostachys jatamansi is safe for use and free from chances of toxicity.

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Conflicts of interest

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Efficacy of Wet Cupping (*Ḥijāma-Bil-Sharṭ*) in the Management of Cervical Spondylosis: A Case Series Study

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Abstract

The present study was conducted on wet cupping to evaluate its efficacy in the management of cervical spondylosis. Wet cupping therapy is one of the earliest recognized therapies in medical practices. Neck pain is one of the leading causes of musculoskeletal disorders having a prevalence and incidence rate of 3551.1 and 806.6 per 100,000 in 2017 globally and 27.0 per 1000 population in 2019 in India. The case series aims to show how wet cupping helps in cervical spondylosis by reducing pain in the neck region. Five patients who complained of neck pain were included to receive six sitting of wet cupping. Two large-sized cups (6.5 cm) and one small-sized cup (5.5 cm) were applied on the cervical region once every 7 days for 42 days. The visual analog scale was used to statistically evaluate the patient at baseline, 7 days, 14 days, 21 days, 28 days, 35 days, and 42 days. After the intervention, all patients showed statistically significant improvements ($P \leq 0.001$) by using the Friedman test. Wet cupping therapy seems easy, comparatively safer, and economical treatment to minimizing and relieving neck pain in cervical spondylosis.

Keywords: *Cervical spondylosis, neck pain, visual analog scale, wet cupping*

Introduction

In the ancient literature of *Unani* medicine, the term "Pain" is expressed as "*Waj'*" which is an Arabic word.[1] It is unusual understanding felt by patients and means the discouraged condition of the body. The International Association for the Study of Pain defines pain as an unpleasant sensory and emotional experience associated with existing or potential tissue damage.[2] It is a major symptom in many medical conditions and can interfere with the daily life activities of a person and general functioning of the body.[3] In *Unani* medicine, neck pain is referred to as "*Waj'-ul 'Unq*" which comes under the broad term "*Waj'-al Mafāṣil*" (Arthritis).[4] This is a painful or inflammatory ailment where pain and inflammation are caused by an accumulation of *Mawade fasida* (morbid matter) in the joints.[5,6] which results in *sue-i-mizaj* (abnormal temperament) and leads to discomfort and tenderness in these joints. Cervical spondylosis is defined as osteoarthritis in the cervical spine characterized by the degeneration of the intervertebral disc and osteophyte formation.[7] Symptoms of cervical spondylosis manifest as neck pain and neck stiffness and can be accompanied by radicular symptoms when there is compression of neural structures. There are three main symptoms related to cervical spondylosis: Neck pain, cervical myelopathy, and cervical radiculopathy. Neck pain is the typical presentation of patients of cervical degenerative disc disease while pain is the most prominent feature in acute cervical radiculopathy and diminishes as the condition becomes chronic.

Neck pain is one of the leading causes of musculoskeletal disorder having a prevalence and incidence rate of 3551.1 and 806.6 per 100,000 in 2017 globally and 27.0 per 1000 population in 2019 in India.[8] The prevalence of neck pain ranges from 0.4% to 41.5%, the 1-year incidence ranges from 4.8% to 79.5%, and lifetime prevalence may be as high as 86.8%. According to the Global Burden of Disease 2015.[9-11]

There is no definitive treatment for neck pain, however, different pharmacological and nonpharmacological treatments have been recommended. These include massage,

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acupuncture, laser, yoga, and aquatic therapy.[12,13] Medicines such as nonsteroidal anti-inflammatory drugs (NSAIDs), systemic steroids, muscle relaxants, antidepressants, and anticonvulsants may be prescribed to treat pain. There is insufficient evidence to support the use of physical therapies such as cervical traction, hot fomentation, ice pack application, ultrasound therapy, therapeutic massage, and transcutaneous electrical nerve stimulator for the treatment of acute or chronic neck pain.[14] All currently available pain relief regimens are designed to be used temporarily and have noticeable, unpleasant side effects.

Cupping therapy has been found effective in various conditions, including blood disorder, pain, inflammation, and physical relaxation.[15] The technique involved in this minor surgical procedure which increases blood circulation and waste excretion through the skin by applying superficial scarification to open the skin barrier, creating negative pressure through an air pump or heat across the skin and underlying capillaries to draw interstitial fluids.[16]

Case Series

Case 1

This patient was a 32-year-old female teacher who attended the outpatient department (OPD) of Hakim Syed Zia-ul-Hasan Government Unani Medical College, Bhopal, Madhya Pradesh, on April 4, 2024, with a complaint of pain in the neck region since 3 years radiating toward left hand. She had a history of LSCS 3 years ago. After the cesarean section, she suffered neck pain and had no history of diabetes mellitus (DM) or hypertension (HTN). Her vitals were stable (blood pressure [BP] = 120/80 mmHg, pulse = 80/min, respiratory rate = 18/min, and temperature = 98.6°F).

X-ray of the cervical spine was showing some degenerative changes. The investigations of the patient before starting the treatment are shown in Table 1.

Case 2

The patient was a 46-year-old male driver who attended the OPD of HSZH Government Unani Medical College, Bhopal, Madhya Pradesh, on February 12, 2024, with complaints of pain in the neck region for 2 months. He had a history of diabetes and HTN but no history of trauma. His vitals were stable (BP = 140/100 mmHg, pulse = 76/min, respiratory rate = 20/min, and temperature = 98.7°F).

X-ray of the cervical spine was showing some degenerative changes normal. The investigations of the patient before starting the treatment are shown in Table 1.

Case 3

This patient was a 25-year-old female student who attended the OPD of HSZH Government Unani Medical College, Bhopal, Madhya Pradesh, on March 2, 2024, with pain in the neck and both shoulder regions followed by headache and vertigo for 3 months. She had no history of trauma or any other chronic illness. Vitals were stable (BP = 120/80 mmHg, pulse = 85/min, respiratory rate = 18/min, and temperature = 98.8°F).

MRI shows nerve compression over C5–C6 of the cervical vertebra of cervical spine. The investigations of the patient before starting the treatment are shown in Table 1.

Case 4

This patient was a 46-year-old male tailor who attended the OPD of HSZH Government Unani Medical College, Bhopal, Madhya Pradesh, on April 18, 2024, with pain in the neck and back region followed by nausea and headache for 2 years. He had no history of trauma, DM, and HTN. Vitals were stable (BP = 130/80 mmHg, pulse = 78/min, respiratory rate = 20/min, and temperature = 98.5°F). X-ray of the neck showing degenerative changes. The investigations of patients before starting the treatment are shown in Table 1.

Case 5

This patient was a 22-year male medical student who attended the OPD of HSZH Government Unani Medical College, Bhopal, Madhya Pradesh, on January 28, 2024, with pain in the neck region. He had no history of trauma or any other chronic illness. Vitals were stable, X-ray of the cervical spine was showing degeneration (BP = 120/80 mmHg, pulse = 82/min, respiratory rate = 16/min, and temperature = 98.6°F). The investigations of the patient before starting the treatment are shown in Table 1.

Informed Consent

Informed consent was taken before the start of the study orally as well as in written.

Intervention

The procedure of *Ḥijāma* (Wet Cupping) was carried out in a blood-letting unit of HSZH Government Unani Medical College, Bhopal, Madhya Pradesh.

Table 1: Investigations before wet cupping

Investigations	Case 1	Case 2	Case 3	Case 4	Case 5
Hemoglobin (g%)	11.5 (g/dL)	13 (g/dL)	10.5 (g/dL)	11 (g/dL)	10 (g/dL)
BT (Minutes)	4	3.50	4.20	3.80	4.50
CT (Minutes)	5.50	6.30	7.0	6.0	7.5
HIV	Nonreactive	Nonreactive	Nonreactive	Nonreactive	Nonreactive
HbsAg	Negative	Negative	Negative	Negative	Negative

Procedure of wet cupping

Before starting the treatment, the patient was instructed on everything and asked to lie down in a prone position on the bed and the area to be cupped was exposed and cleaned with antiseptic lotion. e.g., povidone–iodine lotion or chlorhexidine gluconate, etc. Thereafter three cups, (two medium-sized cups of diameter 5.5 cm and one large-sized cup of diameter 6.5 cm were applied on the supra scapular region and junction of C7 and T1 vertebra respectively). The vacuum pump was used to create negative pressure inside the cups, and 3–4 suctions were made to create enough negative pressure (as mentioned in Unani Literature). Then the cups were kept adhered to the skin for 3–5 min to increase the blood flow to the area. Then the cups were removed by pulling up the valves of the cups easily and the hyperemic area was scarified with the help of a surgical blade (Number 11). This was followed by the application of the cups to suck out the blood/morbid matters and then cups were kept adhered for 5–7 min or until it was filled with blood from capillary vessels [Figure 1]. Once the blood had coagulated, cups were removed finally and the area was again cleaned with antiseptic lotion and sterile dressing was done. The details of the procedure are summarized in Table 2.

Assessment

The pain was assessed on the 0-day, 7th day, 14th day, 21st day, 28th day, and 35th day, and follow-ups were done on the 42nd day to compare it with 0 day [Table 3].

Results

After 6 sittings of *Ḥijāma* (wet cupping), there was a significant difference ($P \leq 0.001$) in pain, as shown in Tables 2 and 3. A Friedman test was applied for statistical analysis. The mean score of neck pain before starting the treatment, i.e., at 0 day was 8.6 while it was 2.2 on the 42nd day.

Table 2: Details of wet cupping procedure

Details of cup	Position, size and duration
Site of cupping	Supra scapular region and junction of C7 and T1 vertebrae
Size of cups	1 large size of 6.5 cm 2 small size of 5.5 cm
Number of cups used	3
Number of sittings	6 sittings (once a week for 6 (weeks)
Duration of the study	42 days

Table 3: Effect of wet cupping on visual analog scale

Vas	Case 1	Case 2	Case 3	Case 4	Case 5
0th day	7	9	10	9	8
7th day	7	8	9	7	8
14th day	5	8	7	6	6
21st day	4	7	4	4	5
28th day	4	5	2	3	3
42th day	2	3	2	2	2

VAS: Visual analog scale

Visual Analog Scale

The visual analog scale is validated, subjective measure for assessment of acute and chronic pain. Scores are recorded on the basis of handwritten mark on a 10 cm line that represents continuous pain between No pain and Worst pain [Figure 2].[17]

Discussion

Pain is the main reason for seeking therapeutic alternatives to conventional medicine.[6] There is increasing evidence that shows that various physical therapies including cupping are effective in managing pain.[7]

Wet cupping is low-cost therapeutic technique with no major side effects if it is performed in sterile condition. This entire case series represents that wet cupping is effective in managing pain. The outcome of this series shows a reduction in pain, its severity, and a significant difference in the degree of pain relief [Table 3]. Five patients with neck pain were clinically diagnosed as having cervical spondylosis and were followed up for 42 days and wet cupping therapy was introduced to the patient.

The use of cervical collar for extended periods weakens the muscles, and nonpharmacological therapies such as cervical traction and neck exercises only provide momentary relief. Pharmaceuticals such as corticosteroids, NSAIDs, analgesics, and muscle relaxants carry a significant risk of adverse effects including various gastrointestinal problems.

Unani Medicine is capable of providing a different, reliable, and effective treatment in this case. Wet cupping therapy becomes extremely beneficial when the joint is affected by humor or joint becomes thick, according to *Jālīnūs* (Galen) and it works on a principle of *Tanqiya-e-mawad* (Removal of Morbid Material) which helps removing morbid matter from the affected area. While the exact mechanism behind cupping therapy remains unclear, some researchers suggest that applying cups to particular points on the skin results in hemostasis or hyperemia, which has a healing effect. *Ḥijāma* (cupping) uses cups to apply suction force or negative pressure to the skin's surface cause the skin to lift and gradually swell due to the skin's viscoelastic qualities. Increased capillary filtration, localized lymphatic and interstitial fluid accumulation, filtered fluids, and their uplifting qualities within the skin. This breaks down tissue, covers nerve endings in gathered fluid adhesions, and decreases chemical mediators of inflammation, and nociceptive substances, all of which lessen discomfort. Reactive hyperemia, a sudden increase in skin blood flow, happens as soon as the cups are taken off. To remove fluids containing pathogenic compounds and prevent their final absorption by venous capillaries, the skin's surface is scarified, opening the skin's barrier. It facilitates the elimination of morbid material from the body by opening pores in the skin, increasing blood circulation, and nourishing the affected area with fresh blood.

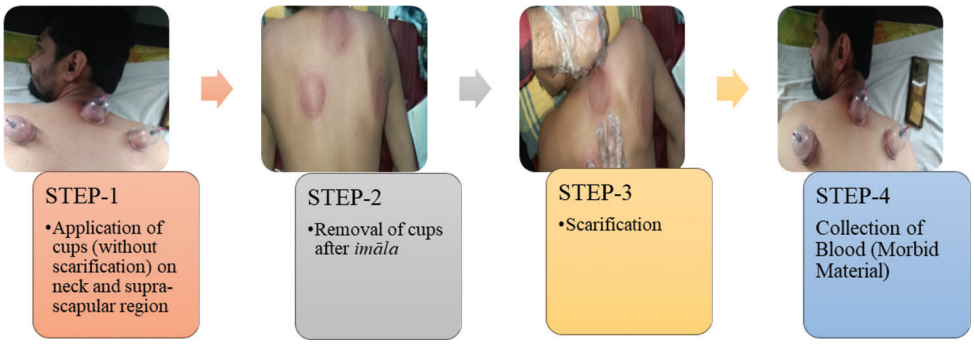

Figure 1: Step-wise depiction of *Ḥijāma bi'l Sharṭ* procedure

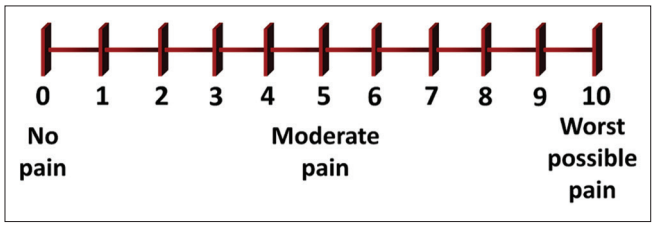

Figure 2: Visual Analog Scale used in the study

According to certain theories, various component contributes to the effect of wet cupping by changes in biomedical properties of the skin that help in the reduction of pain as explained by the Pain-Gate Theory," "Diffuse Noxious Inhibitory Controls," and "Reflex Zone Theory," Muscle relaxation, specific changes in local tissue structures and increase in blood circulation could be explained by the "Nitric Oxide Theory." The immunomodulatory effects of cupping therapy could be attributed to the "Activation of Immune System Theory." Releasing of toxins and removal of wastes and heavy metals might be attributed to the "Blood Detoxification Theory." This case series may have several limitations such as a small sample size, a short study period, and limited evaluation parameters. Consequently, it is suggested that more extensive evaluation scales be used in longer-term, larger sample-size clinical trials in the future. The specific mechanism of action of wet cupping needs more explanation. Consequently, to ascertain its direct influence on neck pain analytical research is needed.

Conclusion

This case series shows that wet cupping has an immediate therapeutic effect than standard treatment or any other care. Six sittings of wet cupping for 42 days were found effective in the management of pain in patients of cervical spondylosis [Table 3]. The individual did not report any other adverse effects.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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Case Report

Evaluating the Role of Unani Medicine in Dermatitis: A Case Report

Abstract

Dermatitis is a common inflammatory skin condition characterized by symptoms such as itchy rashes and swollen and reddened skin. A 38-year-old male patient presented with inflamed, patchy, and itchy skin, diagnosed as dermatitis. He was treated with Unani medicine, specifically a *Joshānda* (decoction), along with compound formulations such as *Iṭrīfal Shāhtra* and *Khamīra-i Marwārīd* administered orally. In addition, coconut oil was applied topically. The treatment lasted 2 months, and significant improvement was observed in the symptoms, including itching, redness, scaling, and inflammation. The patient was advised to avoid spicy foods and certain vegetables such as cabbage, cauliflower, and brinjal. This case highlights the efficacy of Unani formulations in managing dermatitis.

Keywords: *Dermatitis, herbal treatment, Iṭrīfal Shāhtra, Khamīra-i Marwārīd, skin eruptions, Unani medicine*

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Introduction

Atopic dermatitis (AD) is a chronic inflammatory skin disorder with a familial tendency and allergic features. It frequently coexists with other atopic conditions such as asthma and allergic rhinitis. The terms *dermatitis* and *eczema* are often used interchangeably, with "eczema" alone typically referring to AD (atopic eczema). In addition, the term "eczematous" implies scaling, crusting, or serous oozing, as opposed to simple erythema.[1]

Two primary hypotheses have been proposed to explain the pathogenesis of AD. The "outside-in" hypothesis suggests that an intrinsic dysfunction in the epidermal barrier acts as an initial insult that precedes immune activation.[2,3] This defect in the *stratum corneum* allows for transepidermal water loss, facilitates allergen penetration, increases susceptibility to microbial colonization and infection, and predisposes to systemic allergen sensitization, leading to conditions such as food allergy and asthma.[4]

The alternate "inside-out" hypothesis posits that AD is primarily driven by cytokine activity, resulting in immune-driven reactive epidermal hyperplasia.[5] These hypotheses have been subjects of significant debate. The discovery of filaggrin (FLG) gene mutations in AD patients in 2006 temporarily shifted the focus of AD pathogenesis toward epithelial barrier dysfunction.[6] However, only a subset of AD patients (30%–40%) was found to carry this mutation, with significantly lower or even absent FLG mutation rates observed in specific ethnic groups.[7-9]

Recent studies have provided further insight by examining the genomic and histological profiles of AD, particularly through comparisons between nonlesional and lesional skin, as well as acute (lesions under 72 h on previously unaffected skin) and chronic AD lesions. These studies also examined similarities and differences between AD and psoriasis, which has significantly enriched our understanding of AD's pathogenic mechanisms. Findings from these studies indicate that AD is primarily an immune-mediated disease, yet its pathogenesis appears more complex than previously suggested by either hypothesis alone.[10-13]

This study focuses on a 38-year-old male patient diagnosed with dermatitis and treated using traditional Unani formulations. The outcomes indicate significant symptom improvement, providing evidence of the potential efficacy of Unani medicine in managing skin diseases.

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Case Report

A 38-year-old male patient presented with complaints of intense itching, redness, scaling, inflammation, and patchy skin discharge primarily affecting the anterior parts of the lower extremities and face. The patient had a history of seeking allopathic treatment without relief. Upon diagnosis of dermatitis, a treatment plan involving Unani formulation was initiated.

Methodology

The patient underwent a comprehensive general and local examination to evaluate the severity of dermatitis. Symptoms such as pain, itching, and burning were assessed before and after treatment using the Dermatology Life Quality Index (DLQI). The patient was treated for 2 months with the following Unani medicines:

- *Joshānda* (12 ingredients): Administered once in the morning on an empty stomach
- *Iṭrīfal Shāhtra* (10 g at bedtime with water)
- *Khamīra-i Marwārīd* (4 g with milk once daily).

The patient was also advised to apply coconut oil mixed with camphor (100:1) on the affected areas. Dietary restrictions included avoiding spicy foods, cabbage, cauliflower, and brinjal.

Drug composition

The ingredients and part used of *Joshānda*, *Itrifal Shāhtra,* and *Khamira Marwareed* are mentioned in Tables 1-3, respectively.

Observations

A 38-year-old male patient presented with complaints of intense itching, redness, scaling, inflammation, and patchy skin discharge primarily affecting the anterior parts of the lower extremities and face. The patient had a history of seeking allopathic treatment without relief. Upon diagnosis of dermatitis, a treatment plan involving Unani formulation was initiated.

The severity of symptoms was assessed at baseline and subsequently at 15, 30, 45, and 60 days after treatment using a 4-point scale (0 = no symptoms, 3 = severe symptoms). The data collected included ratings for itching, redness, scaling, inflammation, patchy skin, and discharge [Table 4]. To assess the significance of changes in symptom severity, the Wilcoxon signed-rank test was employed. This analysis suggests that treatment with Unani formulations resulted in a statistically significant ($P < 0.05$) improvement in the symptoms of dermatitis, including reductions in itching, redness, scaling, inflammation, and discharge, supporting the efficacy of Unani medicine in managing this condition [Table 4 and Figure 1].

The results demonstrated a marked improvement in the patient's quality of life, with significant reductions in the severity of symptoms as reflected in the DLQI scores. Before treatment, the patient reported high levels of itching, embarrassment, and interference with daily activities. Following the 2-month treatment period, all scores indicated substantial improvements, with most symptoms reported as either significantly reduced or entirely resolved. This indicates a positive correlation between the administration

Table 1: Ingredients of *Joshānda*[14]

Unani name	Scientific name	Part used
Charaita	*S. chirayita*	Stem, leaves
Shāhtra	*F. parviflora*	Shrub
Mundī	*S. indicus*	Flowers
Khār Khasak	*T. terrestris*	Fruit
Bādiyān	*F. vulgare*	Seeds
Gul Surkh	*R. damascena*	Leaves
'Unnāb	*P. domestica*	Root
Kharpaza	*C. melo*	Seed
Khayārayn	*C. sativus*	Seed
Zūfa	*H. officinalis*	Flowers

S. chirayita: Swertia chirayita, F. parviflora: Fumaria parviflora, S. indicus: Sphaeranthus indicus, T. terrestris: Tribulus terrestris, F. vulgare: Foeniculum vulgare, R. damascene: Rosa damascene, P. domestica: Prunus domestica, C. melo: Cucumis melo, C. sativus: Cucumis sativus, H. officinalis: Hyssopus officinalis

Table 2: Ingredients of *Iṭrīfal Shāhtra*[14]

Unani name	Scientific name	Part used
Shāhtra	*F. parviflora*	Shrub
Halayla Zard	*T. chebula*	Fruit
Halayla Kābulī	*T. chebula*	Fruit
Āmla	*E. officinalis*	Fruit
Balayla	*T. bellirica*	Fruit
Sanā Makkī	*C. angustifolia*	Leaves
GulSurkh	*R. damascena*	Leaves
Mawīz Munaqqa	*V. vinifera*	Fruit

F. parviflora: Fumaria parviflora, T. chebula: Terminalia chebula, E. officinalis: Emblica officinalis, T. bellirica: Terminalia bellirica, C. angustifolia: Cassia angustifolia, R. damascene: Rosa damascene, V. vinifera: Vitis vinifera

Table 3: Ingredients of *Khamīra'-i Marwārīd*[14]

Unani name	Scientific name
Marwārīd	*P. margaritifera*
Kahrubā	*P. succinifera*
Tabāshīr	*B. arundinacea*
Yashab	Green jade
Zahar Mohra	Silicate of magnesia
Sandal Safaid	*Santalum album*
Warq Nuqra	Silver leaves/foil
Sharbat-i Seb	Unani compound formulation
Sharbat-i Anār	Unani compound formulation
Sharbat-i Bāhī	Unani compound formulation

P. margaritifera: Pinctada margaritifera, P. succinifera: Pinus succinifera, B. arundinacea: Bambusa arundinacea, S. album: Santalum album

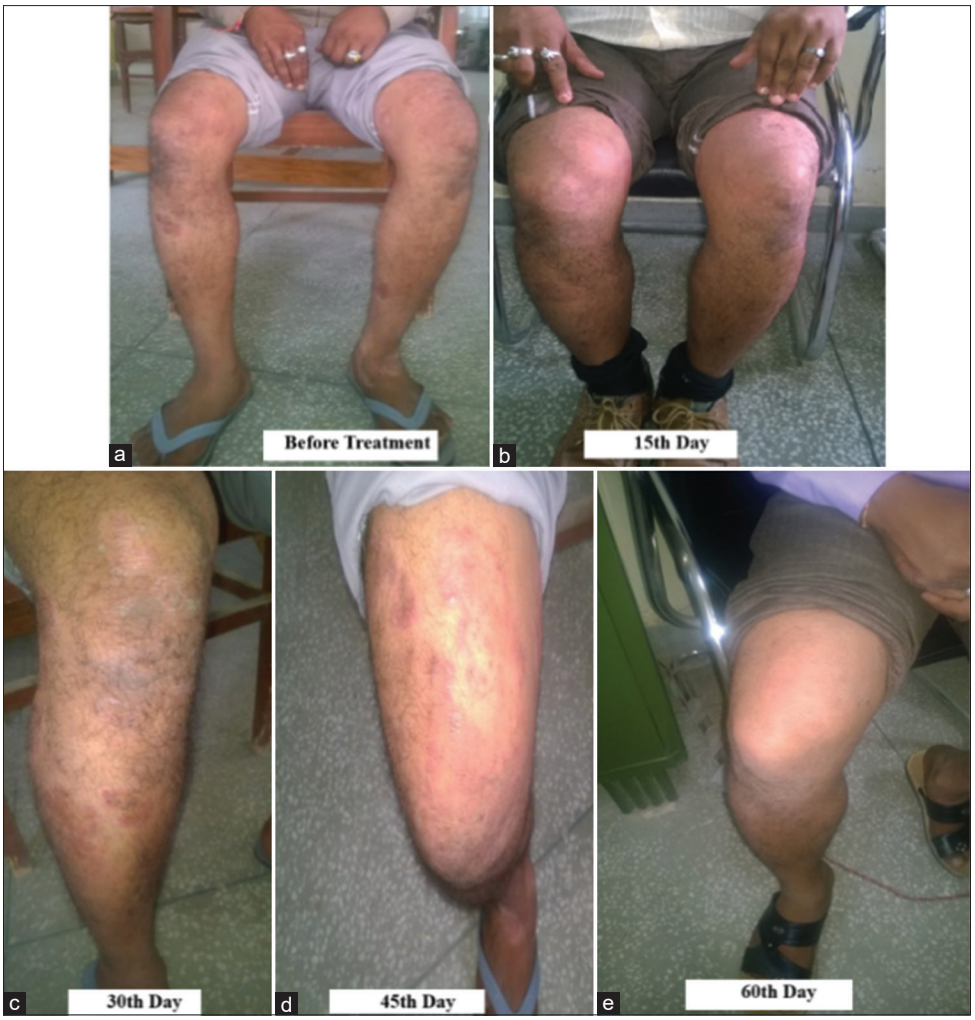

Figure 1: Effect of Unani medicines on dermatitis. (a) before treatment, (b) 15th day, (c) 30th day, (d) 45th day, (e) 60th day

Table 4: Severity of the disease observed before and after treatment

Symptoms	Base line	2nd follow-up 15th day	3rd follow-up 30th day	4th follow-up 45th day	5th follow-up 60th day
Itching	3	3	2	2	1
Redness	3	3	2	1	0
Scaling	3	2	2	0	0
Inflammation	3	2	2	1	0
Patchy skin	3	2	2	1	0
Discharge	2	1	1	0	0

of Unani formulations and the overall quality of life for the patient [Table 5].

Results and Discussion

The patient's symptoms improved significantly following 2 months of treatment. Redness, scaling, inflammation, and discharge were almost completely resolved by the end of the treatment period. The most notable improvement was seen in the reduction of itching and overall discomfort, as shown in Table 4. There was remarkable improvement observed in the lesions, all the lesions were almost reduced [Figure 1a-e].

The efficacy of the treatment can be attributed to blood purifier properties and anti-inflammatory effects of various ingredients of *Itrifal Shāhtra* such as *Hyssopus officinalis* and *Prunus domestica* and the soothing and moisturizing effects of coconut oil.[14] *Khamīra-i Marwārīd* has been traditionally recognized for its ability to strengthen the immune system, which is crucial in managing conditions such as pruritus, particularly when it is associated with AD or allergic reactions. By modulating the immune response, it may help reduce hypersensitivity reactions that contribute to itching.[14-16]

The improvement can be attributed to anti-inflammatory, anti-pruritic, and cooling properties of the Unani

Table 5: Dermatology quality of life index assessment sheet

Question	Before treatment	After treatment
How itchy, sore, painful, or stinging has your skin been	3	1
How embarrassed or self-conscious you are due to your disease	3	0
How much has your skin interfered with you going shopping	2	0
How much your skin has influenced the clothes you wear	2	0
How much has your skin affect any social activities	2	0
How much has your skin made it difficult to do any sport	2	0
Has your skin prevented you from working or studying	2	0
How much has your skin created problems with your partner	2	0
How much has your skin caused any sexual difficulties	2	0
How much has your skin created problems with prepared food	1	0
Total	21	1

formulations.[17] Notably, *Hyssopus officinalis* and *Prunus domestica* are well-known for their soothing effects on inflamed skin. The patient's quality of life also improved significantly, as indicated by the DLQI scores [Table 5]. These findings suggest that Unani formulations can be considered a valuable alternative or complementary treatment for dermatitis.

Conclusion

This case study demonstrates the efficacy of Unani medicine in treating dermatitis. The treatment led to significant improvement in symptoms and quality of life, indicating the potential of Unani formulations as an effective alternative for managing inflammatory skin conditions. Further clinical trials are recommended to validate these findings on a larger scale.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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