INTERNATIONAL JOURNAL OF UNANI AND INTEGRATIVE MEDICINE

E-ISSN: 2616-4558
P-ISSN: 2616-454X
www.unanijournal.com
IJUIM 2025; 9(3): 204-208
Impact Factor (RJIF): 6.59
Peer Reviewed Journal
Received: 18-09-2025
Accepted: 24-10-2025

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Rabies in Unani medicine: Prevention and Management

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DOI: https://www.doi.org/10.33545/2616454X.2025.v9.i3c.403

Abstract
Rabies, also referred to as Hydrophobia, is an acute and almost universally fatal viral infection of the central nervous system, primarily transmitted through the bite of a rabid animal via infected saliva. The causative agent belongs to the Rhabdoviridae family, specifically the Lyssavirus genus, which includes at least seven distinct viral types known to cause rabies. In the Unani system of medicine, this disease is recognized as Daul Kalb. Both domestic and wild animals such as dogs, jackals, foxes, wolves, tigers, bears, horses, mules, and panthers can act as vectors of the virus. Following a bite, the virus impacts the Markazi Nizaam-e-Asaab (central nervous system) by disturbing the balance of the Arkaan (basic bodily elements). Initial local signs include a deep wound that may bleed dark-colored blood and is often accompanied by numbness. As the disease progresses into the prodromal and encephalitic stages, classical symptoms such as Faza'ul Maa (hydrophobia) emerge, indicating systemic involvement. Unani medicine prescribes immediate first aid such as allowing the wound to bleed, cauterizing it with warm ghee, and applying traditional formulations like Tiryaq. Systemic treatment involves internal medications administered after purgation with the latex (milk) of *Calotropis procera*. Traditional and folk remedies are also widely used across India in managing rabies. Thus, with early intervention and appropriate use of Unani therapies such as the administration of Tiryaq-e-Farooq and purification methods (Musaffiyat) rabies (Daul Kalb) can be effectively managed and possibly prevented when treated promptly after exposure.

Keywords: Rabies, Hydrophobia, Daul Kalb, Unani Medicine, Lyssavirus, Tiryaq-e-Farooq

Introduction
Rabies is a deadly viral zoonotic disease that continues to pose a significant public health threat across both developed and developing nations, including India. The burden of this disease is particularly high in Asia and Africa, with the Indian subcontinent reporting the greatest number of cases globally. In terms of years of life lost due to infectious diseases, rabies ranks as the seventh most devastating worldwide.

India alone bears a substantial portion of the global rabies burden. The annual incidence of animal bites is approximately 1.7%, with children showing a higher vulnerability at 2.5%. Among the affected individuals, nearly 68% are male. Across Asia, an estimated 12 million people receive post-exposure treatment each year due to contact with animals suspected of carrying the rabies virus. The economic impact is also significant, with annual expenditures exceeding US$ 563 million.

Classical Unani texts including references under the term Daul Kalb also document the causes, symptoms, and prevention strategies for rabies. These texts describe not only the responsible animals but also clinical features and treatment protocols. Interestingly, the symptom of hydrophobia as understood in modern medicine closely parallels Faza'ul Maa described in Unani literature.

This article aims to critically examine and elaborate on the Unani understanding of rabies (Daul Kalb), highlighting its pathogenesis, clinical presentation, and traditional management approaches, while supporting them with scientific rationale and evidence-based perspectives.

Animals responsible for rabies
Various animals are identified as carriers of rabies (Daul Kalb) in classical Unani literature, including Kamil-us-Sana, Sharh-e-Asbaab, Kitab al-Mansoori, Firdous-ul-Hikmat, and Ilaj-ul-Amraz.

These sources mention animals such as dogs, jackals, foxes, wolves, bears, tigers, mules, horses, and panthers as potential transmitters of the disease. Modern medical science has expanded this list to include all domestic and wild animals, with particular emphasis on bats as significant vectors of the rabies virus [11-15].

Pathogenesis

Modern Medicine Perspective

Rabies infection begins with the inoculation of the virus into the skin, most commonly through the bite of an infected animal. The virus, present in the saliva, initially replicates in the striated muscle cells at the site of entry. It then gains access to the peripheral nervous system through neuromuscular or neurotendinous spindles, where unmyelinated sensory nerve endings are located. Neurotransmitter receptors such as acetylcholine are believed to facilitate viral attachment and internalization [2].

Following this, the virus travels centripetally along peripheral nerves toward the Central Nervous System (CNS), likely via axoplasmic transport, at an estimated rate of approximately 3 mm per hour. Although viremia (presence of the virus in blood) has been observed under experimental conditions, it is not considered a significant factor in natural infections [2].

Upon reaching the CNS, the rabies virus replicates predominantly within the gray matter. It then spreads centrifugally along autonomic nerves to reach other organs, including the salivary glands, adrenal medulla, kidneys, lungs, liver, skeletal muscles, skin, and heart. Viral replication in the mucin-secreting acinar cells of the salivary glands enables further transmission through saliva [2].

Unani Perspective

In the Unani system of medicine, the pathogenesis of rabies (Daul Kalb) is understood as a disturbance of the Arkan (basic elements) and Akhlaat (humors) caused by the toxic substance transmitted through the bite of a rabid animal. This toxic influence affects the Markazi Nizaam-e-Asaab (central nervous system), leading to both local and systemic manifestations. Local symptoms like pain and numbness at the site of the bite eventually progress to neurological features such as hydrophobia (Faza'ul Maa), anxiety, restlessness, and convulsions, signifying deeper involvement of the nervous system [11-13].

Table 1: Clinical Features of a Rabid Bite (Local)

S. No.	Clinical Feature Unani Texts (Kamil-us-Sana, Al-Qanoon, Firdous-ul-Hikmat) [11-15]	Modern Medicine [1-10]
Wound	Deep or penetrating wound (jurh-e-naar baazi)	Abrasion/Laceration/Penetrating wound
Bleeding	Blackish bleeding from the bite site	Seen in penetrating wounds
At or around the site of virus inoculation	Numbness, burning, discoloration, inflammation (taharruq, taffun)	Paresthesia and/or fasciculations

Though the entire clinical features are not similar, but most of the clinical features of Rabies (Modern Medicine) are similar to Daul Kalb (Unani). Local feature like penetrating wound with bleeding & numbness at-around the wound are found most of time which is mentioned in both medical sciences.

Table 2: Systemic clinical features of rabies

Phase	Clinical Feature	Modern Medicine [1-10]	Unani Medicine (Al-Qanoon, Kamil-us-Sana, Firdous-ul-Hikmat) [11-15]
Prodromal Phase (1-4 days)	Fever	+	+
	Headache	+	+
	Malaise	+	+
	Myalgias	+	+
	Increased fatigability	+	+
	Anorexia	+	+
	Nausea	+	+
	Vomiting	+	+
	Sore throat	+	+
	Non-productive cough	+	+
	Excessive motor activity	+	+
	Excitation	+	+
	Agitation	+	+
	Confusion	+	+
	Hallucinations	+	+
	Combativeness	+	+
	Bizarre aberrations of thought	+	+
	Muscle spasms	+	+
	Meningismus	+	+
	Opisthotonic posturing	+	-
	Seizures	+	+
	Focal paralysis	+	+
	Hyperesthesia with excessive sensitivity to bright light, loud noise, touch, and even gentle breezes	+	+
	dilated irregular pupils	+	-
	Increased lacrimation, salivation, perspiration	+	+

	Postural hypotension	+	-
	Upper motor neuron paralysis with weakness, increased deep tendon reflexes, and extensor plantar responses	+	+
	Paralysis of vocal cords	+	+
	Hydrophobia	+	+
Coma, death Several days to 1 Week	Autonomic instability	+	+
	Hypoventilation	+	+
	Apnea	+	+
	Respiratory arrest	+	+
	Hypo-/Hyperthermia	+	+
	Hypotension	+	-
	Pituitary dysfunction	+	-
	Rhabdomyolysis	+	-
	Cardiac arrhythmia and arrest	+	+

Prodromal feature like fever, headache, malaise, myalgia & excitation, agitation, Meningismus, focal paralysis, Excessive dripping of saliva, hanged down of shoulder, neck & *fazaul maa* (Hydrophobia) these Neurologic features are also similar. As per Modern Medical Science the painful, violent, involuntary contraction of the diaphragmatic, accessory respiratory, pharyngeal, and laryngeal muscles initiated by swallowing liquids called as Hydrophobia 20 and as per Unani Fear of water by the sight, touch & sound called as fazaul maa (Hydrophobia).

Unani aspect of prevention & management of rabid bite (Local)

Classical Unani literature outlines a staged approach to the early management of venomous or rabid animal bites. During the initial phase (days 1-3), treatment involves dilating the wound margins and performing Hijama (wet cupping) with strong negative pressure to evacuate contaminated blood, followed by the application of escharotic and debriding topical agents. A paste prepared from crushed garlic (*Allium sativum*) mixed with vinegar is recommended for its antimicrobial and counter-irritant properties [12]. Today Modern medicine has suggested Anti-Rabies-Serum (ARS) locally 20 iu/kg [16]. Suturing if requires should be done after 24-48 hours with minimal stitches.

Unani aspect of prevention & management of rabies (Systemic)

Once systemic dissemination of the toxin occurs, further mechanical dilation is considered ineffective; instead, therapeutic emphasis shifts toward maintaining the wound in an open state and initiating systemic detoxification (Tanqiya-e-Badan). This includes the use of purgative regimens traditionally employed in melancholia (Malikholiya) to eliminate morbid humors (Akhlaat-e-Fasida). Specific classical formulations such as Dawa-e-Zarariyah and Dawa-e-Sartan, indicated for rabid dog bites, are administered, with historical descriptions noting the passage of abnormal tissue-like masses in urine following Dawa-e-Zarariyah, interpreted as expelled pathological humors. Subsequent management aligns with therapeutic protocols for Malikholiya, incorporating temperament-balancing dietary measures, therapeutic bathing (Hammam), and cooling interventions aimed at restoring humoral and temperamental homeostasis [12].

Systemic and local management by Unani in dog bite

Classical Unani sources recommend applying Hijama (wet cupping) directly over the site of the bite or wound, using strong suction to draw out blood and other harmful materials. Following cupping, a poultice of Mufatteh-e-Urooq (vessel-opening) medications is applied to the affected area, while ensuring that the wound does not close prematurely. Various topical preparations are advised for this purpose, such as poultices made from roasted beetroot and onion in clarified butter, as well as escharotic ointments formulated with agents like Sheer-e-Baladar and Zift, which promote debridement. Cauterization (Kaiy) at the early stage of the disease is considered beneficial, and both cupping and cautery are recommended only within the first three days of the bite; beyond this period, these interventions are regarded as ineffective due to systemic spread of the toxin [13].

To prevent premature wound closure at later stages, ointments prepared from roasted Jarjeerah and similar substances in ghee are applied. Treatment should begin before the patient develops hydrophobia, which typically appears between one and six weeks after exposure, though in some moist-tempered (Ratab al-Mizaj) individuals it may occur after several months. Such patients are managed with purgative therapy (Adwiya-e-Mus'hila) and medications described under the treatment of melancholia (Malikholiya), in addition to similar dietary and bathing regimens. The patient is advised to consume diluted milk and certain stimulatory beverages, while nutrient-dense foods such as meat and sweet preparations are recommended to promote strength. Increased sleep, physical play, and recreation are also encouraged. Dietary guidance includes the use of softened bread prepared from refined wheat flour soaked in water, noted for its temperate, thirst-quenching, and laxative effects. In summary, treatment principles parallel those used for Malikholiya, and formulations such as Dawa-e-Jalinus along with the recommended compound prescription should be administered [13].

According to Unani physicians, Sartan-e-Nahri is placed in several clay pots and heated in a tannūr (oven) until it is sufficiently burned to allow easy pulverization, but without complete charring. After calcination, it is finely ground, and 10 parts of this substance are mixed with 5 parts of Gentiana (Jantiyāna) and 1 part of Kundur (Boswellia). All ingredients are combined, dissolved, and stored for use [13].

Patients are administered 7 grams of this formulation twice daily, in the morning and evening. No purgative (mus'hil) should be given during the period of treatment. After the dose, the patient should be given cold water to drink. This medication is to be continued for an extended period [13].

Galen (Jālīnūs) reported that among individuals bitten by a rabid dog, none developed hydrophobia after receiving this regimen. However, if despite treatment the patient begins to

show fear of water, recovery is unlikely [13].

In such cases, the patient should be kept in a cool environment, and water should be administered through a tube, ensuring that the patient's gaze does not fall upon water. The patient's head and entire body should be massaged with oils. An enema (ḥuqnah) made of barley water, Roghan-e-Gul (rose oil), psyllium husk mucilage, and purslane extract should be administered to alleviate excessive thirst. With these measures, there remains some expectation of recovery [13].

Discussion

Rabies, a fatal viral disease caused by the Lyssavirus genus, remains a significant public health concern, particularly in regions such as India, where it is a leading cause of death following animal bites. The pathogenesis of rabies is well-documented in modern medicine, where the virus enters the body through a bite, travels along peripheral nerves, and ultimately infects the Central Nervous System (CNS), leading to severe neurological symptoms and, if untreated, death. In contrast, the Unani system of medicine approaches the disease from a humoral and elemental balance perspective. According to Unani thought, rabies (known as Daul Kalb) results from an imbalance of the Arkan (basic elements) and Akhlaat (humors) that disrupt the functioning of the Markazi Nizaam-e-Asaab (central nervous system). Both systems acknowledge similar clinical features, such as the characteristic wound, hydrophobia, and neurological symptoms, though the Unani texts provide a unique understanding and approach to prevention and treatment.

The two medical paradigms share notable similarities in their description of the disease's progression. In both systems, initial symptoms include localized pain, numbness, and the onset of neurological disturbances like anxiety and agitation, progressing to severe manifestations such as hydrophobia, convulsions, and paralysis. The prodromal and encephalitic phases in modern medicine correlate well with the descriptions found in Unani literature, where the stages of disease involve the onset of systemic symptoms, escalating to full-blown neurological dysfunction.

While modern medicine predominantly focuses on post-exposure prophylaxis with rabies vaccines and Anti-Rabies Serum (ARS), Unani medicine offers a range of traditional interventions. Classical treatments like Hijama (wet cupping), cauterization, and the use of herbal formulations such as Tiryaq-e-Farooq are central to the Unani approach. Additionally, purgative treatments to "purify" the body of harmful humors, along with dietary and lifestyle adjustments, are advocated to restore balance and prevent the disease from progressing to its fatal stages. The therapeutic focus in Unani medicine is largely symptomatic, aiming to alleviate discomfort and prevent systemic involvement, with a holistic emphasis on the body's natural healing processes.

In terms of management, both systems agree on the importance of early intervention. In Unani medicine, it is particularly emphasized that therapies should be administered during the early stages, when the infection is still localized and before the disease reaches the neurological stage characterized by hydrophobia. Treatments like wet cupping, cauterization, and the application of traditional topical agents such as garlic paste are believed to expel toxins and prevent the progression of symptoms. Once systemic involvement is evident, Unani therapies shift towards internal detoxification, using purgatives and specific herbal formulations to cleanse the body of accumulated morbid humors.

However, while modern medicine has a clear advantage in terms of established vaccines and prophylactic treatments, Unani methods provide valuable insights into complementary and integrative approaches. These traditional practices, often used alongside modern treatments, can offer additional relief, especially in terms of symptom management and patient comfort.

Personal safety against rabies

Do not touch animal bite wounds with bare hands. Do not touch the fomites *viz*. chain, food plate, etc. of an animal suspected or proven of rabies. Do not touch stray or sick animal. Take pre-exposure vaccination if you are in constant touch with animals. Avoid contact with saliva, urine, tears, semen and vaginal secretions of a hydrophobia (rabies) patient. Provide pre-exposure prophylaxis to those medical, nursing and ancillary staff who regularly attends to hydrophobia patients and to public health personnel removing rabid and stray animals. Veterinarians shall always be on pre-exposure prophylaxis, wear gloves, glasses, masks and long sleeved overall while examining rabid animals. Besides all instruments used shall be sterilized either by boiling or by placing them in a strong antiseptic solution. The most important thing is to learn how to avoid dog bites. Typical warning signs of unfriendly dogs are snarling or a stiff stance ears laid back and fur/hair on back standing up.

Conclusion

Rabies (Daul Kalb), both in modern medical practice and within the framework of Unani medicine, demonstrates a profound understanding of the pathogenesis and clinical presentation of the disease, with both systems recognizing the critical role of the central nervous system and the potential for rapid progression following exposure. While modern medicine has made significant strides in the prevention of rabies through vaccination and the use of anti-rabies serum, Unani medicine offers a holistic approach to early intervention, focusing on local and systemic treatments aimed at restoring balance within the body. The intersection of these two approaches presents an opportunity for integrative care, where Unani treatments can be used to complement conventional therapies, especially in regions where rabies remains a major public health challenge.

Ultimately, early intervention is key to managing rabies effectively, and a multi-disciplinary approach that incorporates both modern and traditional practices can provide the most comprehensive care. The future of rabies management could benefit from greater integration of these systems, potentially leading to improved outcomes, particularly in under-resourced regions where access to modern healthcare may be limited. The continued study and understanding of both medical paradigms could foster better, culturally appropriate strategies for rabies prevention and treatment worldwide.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article
Yaseen S, Hussain MM, Iffath J, Begum K, Shoeb M. Rabies in Unani medicine: Prevention and Management. International Journal of Unani and Integrative Medicine. 2025;9(3):204-208.