Mini Review

Rhazes's Perspective on the Prevention and Treatment of Rabies

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Abstract:

Iranian traditional medicine holds a millennia-old legacy in viral disease management, with classical scholars like Rhazes (854–925 CE) making groundbreaking contributions to rabies prevention. This study examines Rhazes' innovative approaches, including clinical observations, bite management protocols, and transmission control strategies that predate modern epidemiology. Using historical research methods aligned with the Annales school, we analyze his emphasis on isolation measures, dietary interventions, and environmental factors in disease prevention. Notably, Rhazes' recommendations for rabies control show remarkable parallels with contemporary WHO guidelines. His work demonstrates an advanced understanding of contagion theory, including climate influences and contact precautions. The study highlights how Rhazes' experimental methods and systematic patient care protocols offer valuable insights for modern viral disease management. By bridging ancient Persian medical wisdom with current practices, this research underscores the enduring relevance of traditional knowledge in global health. The findings advocate for integrating historical preventive approaches into modern healthcare systems, particularly for zoonotic diseases like rabies. This investigation not only documents Iran's medical heritage but also provides a model for interdisciplinary dialogue between traditional medicine and evidence-based practice. The study ultimately positions Rhazes as a pioneer whose rabies management strategies remain conceptually valid centuries later.

Keywords: Medical History, Traditional Iranian Medicine, Rabies, Rhazes

1. Context

Across the globe, traditional medicine (TM) serves as either the cornerstone or a complementary component of health care delivery. The World Health Assembly (WHA) resolution on Traditional Medicine (WHA62.13), adopted in 2009, highlights the importance of TM and complementary medicine (T&CM) as a vital yet often underappreciated aspect of health care systems. T&CM is practiced in nearly every country worldwide, and the demand for its services continues to grow. When TM is proven to be safe, effective, and of high quality, it significantly contributes to the goal of ensuring universal access to health care (1). Many countries now recognize the need to develop a cohesive and integrative approach to health care that enables governments, practitioners, and—most importantly—health care users to access T&CM services in a manner that is safe, respectful, cost-efficient, and effective (2). Since the publication of the previous global strategy in 2002, much has evolved. An increasing number of countries have come to acknowledge the role T&CM can play in promoting individual health and well-being, as well as enhancing the comprehensiveness of their health care systems. Governments and consumers are no longer solely focused on herbal medicines; they are now exploring whether T&CM practices and practitioners should be integrated into mainstream health service delivery. In response to this growing demand and WHA Resolution 62.13 on TM, the World Health Organization (WHO) recently updated the objectives of its Traditional Medicine Programme (1). The WHO Traditional Medicine Strategy 2014–2023 aims to equip health care leaders with tools to develop solutions that align with a broader vision of improved health outcomes and patient autonomy (1).

Interestingly, in Iran, prior to the establishment of the Pasteur Institute of Iran in 1920 and the National Center for Reference & Research on Rabies in 1923, the prevention and treatment of rabies were guided and managed by practitioners of Iranian traditional medicine (3, 4). Globally, folk medicine and traditional medicine have offered unique approaches to addressing a wide array of injuries and diseases, including bites from rabid animals. While the efficacy of most traditional anti-rabies treatments has not been validated through controlled clinical trials, community-based surveys have demonstrated their practical effectiveness (5).

2. Data Acquisition

Rabies has long been a subject of interest in folk medicine, as evidenced by its mention in ancient Iranian texts such as the Avesta. For instance, chapters 35–38 of the Vendidad refer to rabid dogs as “mad dogs” and outline guidelines for their humane treatment and containment (6). Once regarded as a general encyclopedia, this text emphasizes that insane dogs should be treated with care and kept captive. Traditional medicine sources document numerous cases involving knowledge of external agents and mediators of rabies transmission, including preventive measures. These accounts suggest that the practices described are grounded in evidence and clinical experience (7). (Figure 1)

Figure 1: Statue of a Bijar breed dog from the Achaemenid period (Museum of Ancient Iran)

The Lyssavirus genus comprises RNA viruses belonging to the Rhabdoviridae family within the Mononegavirales order. Mammals, including humans, serve as the natural hosts for viruses in this genus, among which the Rabies virus is responsible for causing the disease rabies in humans (8). Rabies is a viral disease transmitted when an infected canine bites a human, allowing the virus in the canine's saliva to enter the human body through the wound. The virus then spreads via the bloodstream until it eventually reaches the nervous system. The incubation period—the time between infection and the onset of symptoms—typically ranges from one to three months but can vary significantly, lasting less than a week or extending beyond a year. Early symptoms include fever, mental discomfort, depression, insomnia, anxiety, persistent sadness and frustration, lethargy, an itching sensation at the bite site, and hydrophobia. Additional signs of the disease include swelling of lymph nodes near the bite site, shortness of breath, escalating periodic tetanoid spasms (particularly in the respiratory muscles), albuminuria, and the presence of cytoplasmic bodies in the brain (9).

This study employed a descriptive research methodology, incorporating library-based and historical research approaches to examine original texts and traditional medical books from Iran. Drawing on the French historiographical school, specifically the Annales School, which emphasizes a critical examination of historical approaches in the context of scientific development—with a particular focus on central Iran—the study compares the methods of preventing infectious diseases, such as smallpox, in Iranian traditional medicine with those of modern medicine. Below are the stages involved in gathering and compiling this research:

A) Comprehensive Examination of Primary Sources: A detailed review was conducted of Rhazes' perspectives on the prevention and treatment of rabies, utilizing first-hand historical sources, contemporary research, and scientific articles. References were drawn from Arabic, English, and Persian sources, supplemented by searches in reputable databases such as SID, Google Books, Google Scholar, Internet Archive, and Scopus to gather additional information. The findings were then synthesized and documented.

B) Note-Taking on Relevant Topics: Notes were systematically recorded on pertinent research topics, ensuring that all relevant aspects of Rhazes' contributions were captured.

C) Systematic Classification of Notes: The collected notes were organized into introductory sections and systematically classified for ease of reference and detailed analysis.
D) Finalization and Writing: The gathered information was reviewed, finalized, and written up in a coherent and structured format.
The authors aim to focus their efforts on introducing Rhazes' views on the prevention and treatment of rabies, comparing these with modern medical practices. Additionally, treatment solutions derived from traditional medicine will be explored and contrasted with contemporary approaches, an area that has received comparatively less attention in existing literature.

3. Result

3.1. Rhazes's View on the Prevention and Treatment of Rabies

Iranian traditional medicine texts extensively address rabies, emphasizing its transmission to humans through the bite of rabid dogs. To prevent the disease, these texts recommend recognizing and avoiding rabid animals or eliminating them due to their role in spreading the disease. If bitten by an animal, it is advised to allow the wound to bleed profusely and avoid bandaging it, as per traditional guidelines for rabies wounds (7, 10). One of the most prominent figures in Iranian medical history is Abū Bakr al-Rāzī (Rhazes) (c. 854–925 CE), whose contributions span various fields of medical science and pharmacology. Rhazes documented numerous experiments and clinical observations in his works, including insights into rabies (11, 12, 13).
In his book Al-Mansouri fi al-Tibb (The Book of Medicine Dedicated to Mansur), Rhazes references the methods of earlier physicians for diagnosing rabies: "If a dog bites a man and it is unclear whether the dog was rabid, one should soak a piece of bread in blood drawn from the bite site and throw it to another dog. If the dog eats the bread, the bite is not from a rabid dog; if it avoids eating it, the bite is from a rabid dog. [Another method is to] crush some walnuts, apply them to the wound overnight as a dressing, and the next day, throw the dressing to a chicken or rooster. If the bite was from a rabid dog, the bird will refuse to eat it. Even if the bird consumes it out of hunger, it will die the following day. If these signs are observed, it is recommended to reopen the wound and provide the necessary care as described. If no such signs appear, the wound may be closed" (14).
Rhazes observed that dogs are more prone to rabies during extreme heat and, occasionally, in winter. He noted that rabid dogs avoid consuming food and water, to the extent that they may even exhibit aversion to water, nearly perishing at the mere sight of it (14).
To aid in diagnosing rabies, Rhazes emphasized in Al-Mansouri fi al-Tibb (The Book of Medicine Dedicated to Mansur) that, in addition to recognizing the signs of rabies, certain critical considerations must be taken into account to ensure that an animal intended for keeping or one bitten by another animal is not rabid. He stated: "Since being bitten by a rabid animal causes a severe and life-threatening disease, the signs of rabies should be widely publicized so that people may avoid such dogs and, if necessary, euthanize them." To combat rabies, Rhazes described the characteristics of a rabid dog and the rationale for its elimination: "The dog's mouth remains open, its tongue hangs out, foam and water drip from its mouth and nose, its eyes are red with a blood-

like hue, and its head and ears droop. It tucks its tail between its legs, staggers like a drunkard, attacks and bites indiscriminately, fails to recognize its owner, and barks less frequently. If any or all of these signs are observed in a dog, it is best to euthanize or kill the animal, as a bite from such a dog may initially show no distinct symptoms but will eventually lead to the manifestation of the disease" (14).

Razi also advises: "When bitten by a rabid dog, the wound should not be stitched, and the bite wound must remain open. Immediately after the bite, the wound should be opened to drain a significant amount of blood. If the patient does not recover within one day of the onset of rabies symptoms, there is no hope for recovery" (7, 10). To manage rabies, it is recommended to place the patient in a cool, quiet environment and administer fluids using a gastric tube, as pharyngeal muscle spasms prevent swallowing, making it difficult to replenish lost fluids (14). Razi further suggests: "Increase the intake of meat and sweets in the patient's diet, ensure adequate rest, insert a long tube into the mouth for treatment, and provide water. Additionally, if the patient is unable to swallow, use liquid remedies and administer enemas to quench their thirst" (14).

In Kitāb al-Ḥāwī fī al-Ṭibb (The Comprehensive Book on Medicine), Razi describes a treatment for rabid dog bites involving the consumption of burnt crab. He recommends burning the crab, mixing three ounces of its ash with 1.5 ounces of cinnamon, and consuming the mixture with wine for three days. He also highlights the efficacy of combining burnt crab ash with cinnamon and frankincense for treating rabid dog bites, describing this remedy as particularly impressive. Razi advises doubling the amount of burnt crab ash if several days have passed since the bite. Elsewhere in the same book, he emphasizes the usefulness of the pomegranate plant, recommending the consumption of pomegranate gum, very sour vinegar, and olive oil as a definitive cure for rabies caused by bites. Razi believed that applying sardine extract or pickle as a poultice could effectively treat rabid dog bites. He also mentions the use of clay, wine, water, or honey individually for treating such bites (15).

In Man la Yahduruhu Al-Tabib (For One Who Has No Physician to Attend Him), Razi lists substances that can be used as poultices for wounds, including onions, garlic, and ginger. He further suggests using a combination of camel urine, licorice, frankincense, and Cuscuta before the onset of symptoms. Epithymum has been employed to treat bite wounds, and irrigation of the wound caused by rabid dog bites is recommended to remove blood from the affected area (15). Razi also describes Lytta vesicatoria as having a remarkable and beneficial effect in preventing rabies (16).

3.2. Rhazes' Clinical Observations

Rhazes also wrote of a personal experience in the Ray hospital regarding a schizophrenic and delusional person: "There was someone in the hospital, whom a rabid dog had bitten. [They] barked in the night, and would feel fright and start shaking whenever water was brought for [them], despite constantly asking for water and complaining about thirst. When we brought water near [them, their] face would become grim and full of anger, and [they] would throw the [bowl of] water away, and say that it was full of filth. When we asked what kind of pollution was in the

water, [they] would respond that it had cat and dog guts in it. And then [they] would ask that we bring him another [bowl of] water, and if we did, [they] would repeat what [they] said before and become agitated and hostile to us. [They] would beg us to let [them] drink fresh and clear water for the sake of God" (8).

The latency period —the interval between infection and the onset of symptoms—is one of the notable aspects of Rhazes' perspective on rabies. He explained: "If such a dog bites someone, initially, the person does not realize they are sick and may dismiss it as a minor bite. However, after a short while, signs of illness begin to appear. The individual develops a fear of water, avoids drinking it, and starts trembling at the sight of water. These seizures can progress to the point of being fatal. The patient will fear anything wet or fluid, avoiding it until they succumb to thirst. In some cases, the afflicted person may attack and bite others, potentially transmitting the disease to those they bite" (8).

4. Conclusion

4.1. World Health Organization (WHO)'s View on the Prevention and Treatment of Rabies

One of the notable points is the striking similarity between Razi's treatment methods and the protocols recommended by the World Health Organization (WHO). As stated in Section 5.2 of the WHO guidelines on the clinical management of rabies patients: "Patients remain conscious and are often aware of the nature of their illness but are usually extremely agitated, particularly when excitation predominates. Furthermore, they are often isolated due to the perceived risk of viral transmission through contact. Patients with confirmed rabies should receive adequate sedation and care in an appropriate medical facility, preferably in a private room, with suitable emotional and physical support. Repeated intravenous morphine or benzodiazepines are effective in alleviating the severe agitation, anxiety, and phobic spasms that afflict patients with furious rabies. Once furious rabies has been diagnosed, invasive procedures should be avoided, and the patient should be cared for in a private, quiet, draft-free environment. Given the inevitability of death in most cases, treatment should focus on providing comfort, including heavy sedation (barbiturates, morphine) and avoiding intubation or life-support measures once the diagnosis is certain" (17).

Rhazes' ingenuity in addressing rabies demonstrates that he was not only a skilled and experienced physician but also a leading figure in the understanding of this disease. In his works, he meticulously described rabies and its symptoms while emphasizing critical factors, such as how a rabid animal's bite can lead to severe illness. He raised public awareness about the signs of rabies, teaching people to avoid suspicious animals and, if necessary, euthanize them to prevent further transmission. Rhazes provided numerous suggestions for diagnosing and treating rabies, including recipes for ointments, dietary recommendations, and instructions for washing wounds with fresh water to remove contaminated blood. His methods were grounded in the research of earlier physicians, his own clinical observations, and empirical experimentation. Remarkably, his approach closely aligns with the modern protocols recommended by the World Health Organization (WHO), underscoring the enduring relevance of his contributions to medicine. (Table 1)

Table 1: Rhazes' Perspectives on Rabies (Hydrophobia)

Topic	Rhazes' Observations & Theories	Possible Source
Cause	Caused by bites from rabid animals (especially dogs), with transmission via "toxic saliva."	*Al-Hawi*, *Al-Judari wa al-Hasbah*
Symptoms	- Hydrophobia (fear of water) - Extreme agitation/anxiety - Progressive paralysis - Fatal outcome in severe cases	*Al-Hawi*
Incubation Period	Mentioned a variable latency period (days to months after the bite).	*Al-Hawi*
Treatments	- Wound cleansing (e.g., washing with water/salt) - Use of sedatives/palliative remedies.	*Al-Hawi*
Prognosis	Emphasized the fatal nature of the disease once neurological symptoms appeared.	*Al-Hawi*
Differential Diagnosis	Distinguished rabies from similar conditions (e.g., epilepsy or poisoning).	*Al-Judari wa al-Hasbah*

Rabies, as described by Muhammad ibn Zakariya al-Razi (Rhazes), represents a fascinating intersection of early medical observation and scientific reasoning in the medieval Islamic world. In his works, particularly al-Hawi and al-Judari wa al-Hasba, al-Razi provided detailed accounts of rabies (known as dāʾ al-kalb), emphasizing its transmission through the bite of rabid dogs and its devastating neurological effects. His clinical descriptions—including symptoms like hydrophobia, extreme agitation, and muscle spasms—align remarkably well with modern medical understanding, showcasing his keen observational skills. Al-Razi proposed several treatments for rabies, some of which reflect an intuitive grasp of medical principles. He stressed the immediate cleansing of bite wounds to prevent the spread of the "toxic substance" (a prescient notion, given the era's limited knowledge of viruses). He also recommended herbal antidotes and bloodletting (hijama or fasd) to purge the body of toxins. Yet, he acknowledged the near-fatal prognosis once neurological symptoms appeared, demonstrating both his empirical honesty and the limits of 9th-century medicine. What sets al-Razi apart is his rejection of superstition in favor of systematic observation. While he lacked modern tools, his methodology—rooted in cause-and-effect analysis—laid groundwork for evidence-based medicine. Today, we know rabies is caused by the Lyssavirus, preventable through vaccines, but al-Razi's insights remain a testament to his intellectual rigor. His work underscores timeless principles: the importance of prevention, the value of critical inquiry, and the need to challenge misconceptions. Al-Razi's legacy in rabies research highlights how medieval scholars bridged ancient traditions and empirical science. His approach—meticulous, rational, and patient-centered—resonates even now, reminding us that scientific progress often begins with the courage to observe, question, and document the world as it is.

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Authors Contribution

1- Study concept and design: SAG
2- Acquisition of data: SAG, MHN, WSM
3- Analysis and interpretation of data: SAG
4- Drafting of the manuscript: SAG, MHN, WSM
5- Critical revision of the manuscript for important intellectual content: SAG, MHN
6- Statistical analysis: SAG, MHN, AHM
7- Administrative, technical, and material support: WSM
8- Study supervision: MHN

Ethics

It is hereby asserted that all ethical considerations were duly considered during the preparation of the submitted manuscript.

Conflict of Interest

The authors declare no conflicts of interest.

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Data Availability

The datasets generated and/or analyzed during this study are available from the corresponding author upon reasonable request.

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