

Integrative Management of Allergic Rhinitis: Bridging Traditional Unani Medicine with Contemporary Evidence-Based ENT Practice

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DOI: [https://doi.org/10.63001/tbs.2026.v21.i03.S.I\(3\).pp627-639](https://doi.org/10.63001/tbs.2026.v21.i03.S.I(3).pp627-639)

KEYWORDS

Allergic Rhinitis, Unani Medicine, Evidence-Based ENT, Integrative Medicine, Nazli and Zukav

Received on: 30-06-2026

Accepted on: 25-07-2026

Published on: 31-07-2026

Abstract

Allergic rhinitis is among the most common upper respiratory conditions with a chronic inflammatory component, which affects millions of people all over the world and whose impact on quality of life, productivity and health care services is substantial. Although significant improvements have been made in established evidence-based otorhinolaryngology (ENT) techniques, patients still suffer from lasting symptoms, side-effects of drugs or long-term failure of disease control, which has led to a strong interest in complementary and integrative therapeutic methods. Unani medicine as one of traditional healing methods has a long history and its terminology for the allergic rhinitis is quite similar with the above conditions, it promotes the treatments of diseases by controlling diet (Ilaj bill Ghiz), medicine (Ilaj bil Dawa) and regimen (Ilaj bill Tad beer). This paper aims to critically explore the scientific grounds of combining Unani medicine with evidence-based practice in ENT among those suffering of allergic rhinitis. It summarizes the epidemiologic status of SLE, its immunopathogenesis, conventional drugs used and current evidences supportive of the use of Unani herbal formulations and therapeutic regimens. Moreover, the study highlights the strengths and weaknesses of each system, suggesting that they complement each other's effectiveness in symptom control, symptom modulation and patient-centred care. A proposal for an evidence-informed integrative clinical management model, which is suitable for multidisciplinary practice and the goals of safety, efficacy and regulatory compliance, is put forward. The paper finally pinpoints the present research gaps and suggests high-quality clinical trials for solid evidence of incorporating Unani medicine as an integral part of treating allergic rhinitis with modern medicines.

1. Introduction

Allergic rhinitis (AR) is a frequently occurring chronic inflammatory disease of the nasal mucosa that occurs in reaction to exogenous allergen exposure (pollen, house dust mites, Molds and animal dander) and depends on stimulation of a specific immune pathway, namely the immunoglobulin E (IgE). There are episodes that are repeated and accompanied by sneezing, nasal stuffiness, nasal running nose, nasal itching, and often there are eye symptoms (conjunctivitis) that significantly affect someone's day-to-day functioning, sleep, work, and school performance. Allergic rhinitis has become a major health problem in many countries due to rapid urbanization, environment pollution, climate change

and change in lifestyle pattern. More importantly, allergic rhinitis is highly linked to other respiratory diseases such as chronic rhinosinusitis and asthma, and requires all-encompassing and effective disease management.¹

For allergic rhinitis today, there are several current recommendations that advocate for all four of the following: allergen avoidance, pharmacotherapy, allergen immunotherapy and patient education. While these treatments work for many patients, some patients feel they do not provide complete relief, may

¹ World Health Organization (WHO), *WHO Global Report on Traditional and Complementary Medicine* (WHO, Geneva, 2019).

experience recurrence, side effects from drugs, dependency on medication, and financial costs, which has led to interest in complementary and integrative treatments. Unani medicine being one of the oldest traditional medicines, considers the allergic rhinitis as Nazli and Zukav, due to the imbalance of humoral system and environmental factors. Its holistic healing principles, such as dietary changes (Ilaj bill Ghiz), herbal pharmacotherapy (Ilaj bill Dawa) and regimental therapies (Ilaj bill Tad beer), seek to regulate the physiology and enhance the body's natural immune barriers. Using these traditional methods in conjunction with evidence-based ENT practice can be a pathway to improved symptom control, better satisfaction scores, fewer long-range treatments and a better approach to comprehensive, personalized care. This paper discusses the scientific basis, clinical evidences and future of an integrative approach to management of allergic rhinitis.

2. Epidemiology and Global Burden of Allergic Rhinitis

Allergic rhinitis (AR) is one of the most prevalent chronic allergic conditions in the world and is a significant public health problem with a significant socio-economic burden as it is a recurrent chronic condition with high prevalence. It occurs at any age; it's most common in childhood and adolescence, but can also start in adulthood. There is a geographical variation in the prevalence of allergic rhinitis, secondary to the variation of genetic susceptibility, environmental exposures, climatic conditions, urbanization, air pollution and lifestyle factors. These airborne allergens – such as pollen, house dust mites, Molds and environmental pollutants – have been contributing to global rise of allergic diseases due to increased exposure in the atmosphere caused by new features of rapid industrialization and climate change. The epidemiological studies suggest that allergic rhinitis often occurs in association with other allergic diseases such as asthma, atopic dermatitis, allergic conjunctivitis and chronic rhinosinusitis, which would substantiate the notion of “unified airway disease.”²

Allergic Rhinitis has a history that extends beyond

the physical effects and adversely impacts education, employment productivity, sleep and other psychological issues, which in turn has a negative impact on Quality of Life. Nasal congestion and sleep problems lead to fatigue and decreased concentration, anxiety and poorer school/occupation. The economic impact is also significant, with direct economic costs relating to the cost of healthcare (consultation, diagnostics, medication, and immunotherapy), and indirect costs associated with absenteeism, presenteeism, and loss of productivity. Limited specialist access and poor disease management in low- and middle-income countries either due to poor disease awareness or delayed diagnosis further exacerbates the situation of disease management. To address these challenges, a holistic approach to allergic rhinitis care that combines preventive measures, evidence-based medical treatment, and complementary therapies like Unani medicine is essential for achieving better long-term outcomes and lowering the overall burden of allergic rhinitis.³

² ARIA (Allergic Rhinitis and its Impact on Asthma), *ARIA Care Pathways 2020 Update, Allergy*, Vol. 75, No. 4 (2020).

³ D. K. Ledford & J. A. Lockey, "Allergic Rhinitis: Clinical Manifestations and Diagnosis," *Journal of Allergy and Clinical Immunology*, Vol. 145, No. 2 (2020), pp. 375–383.

Table 2.1: Epidemiology and Global Burden of Allergic Rhinitis

Parameter	Description	Clinical/Public Health Significance
Global prevalence	One of the most prevalent chronic allergic disorders worldwide	Increasing healthcare burden across all age groups
Age distribution	Common in children, adolescents, and young adults; may persist into adulthood	Early diagnosis improves long-term disease control
Major risk factors	Genetic predisposition, family history of atopy, pollution, pollen, dust mites, Molds, tobacco smoke	Identifying risk factors aids prevention and disease management
Geographic variation	Higher prevalence in urban and industrialized regions compared with many rural settings	Environmental exposure influences disease occurrence
Common comorbidities	Asthma, allergic conjunctivitis, atopic dermatitis, chronic rhinosinusitis	Requires integrated airway management
Impact on quality of life	Sleep disturbance, fatigue, impaired concentration, reduced social functioning	Significant reduction in physical and mental well-being
Educational impact	Poor school attendance and reduced academic performance	Affects learning outcomes in children and adolescents
Occupational impact	Reduced productivity, absenteeism, and presenteeism	Leads to considerable economic losses
Direct healthcare costs	Expenditure on consultations, investigations, medications, and immunotherapy	Increases healthcare resource utilization
Public health implications	Rising prevalence due to urbanization, pollution, and climate change	Supports the need for integrated preventive and therapeutic strategies

3. Pathophysiology of Allergic Rhinitis

Allergic rhinitis is an immunoglobulin E (IgE)-mediated inflammatory disorder of the nasal mucosa that develops following exposure to environmental allergens such as pollen, house dust mites, Molds, animal dander, and occupational allergens in genetically susceptible individuals. The disease is initiated during the sensitization phase, in which inhaled allergens are captured by antigen-presenting cells, particularly dendritic cells, and presented to T-helper type 2 (Th2) lymphocytes. These activated Th2 cells release cytokines, including interleukin (IL)-4, IL-5, and IL-13, which stimulate B lymphocytes to produce allergen-specific IgE antibodies. The IgE antibodies subsequently bind to high-affinity receptors on mast cells and basophils, preparing the immune system for subsequent allergen exposure.⁴

Upon re-exposure to the same allergen, cross-linking

of IgE antibodies on mast cells triggers rapid degranulation and the release of inflammatory mediators such as histamine, leukotrienes, prostaglandins, and platelet-activating factor. This early-phase allergic response occurs within minutes and is responsible for symptoms including sneezing, nasal itching, rhinorrhoea, and watery eyes. Several hours later, the late-phase inflammatory response develops as eosinophils, basophils, neutrophils, and T lymphocytes infiltrate the nasal mucosa. These inflammatory cells release additional cytokines, chemokines, and cytotoxic proteins that sustain mucosal inflammation, increase vascular permeability, stimulate excessive mucus production, and cause persistent nasal congestion and hyperresponsiveness. Chronic inflammation may further impair mucociliary clearance and contribute to structural changes within the nasal mucosa. The close association of allergic rhinitis with asthma and other atopic disorders supports the concept of the united airway disease, emphasizing that inflammation of the upper and lower respiratory tracts shares

⁴ K. F. Chung et al., "Inflammatory Mechanisms in Allergic Airway Disease," *Nature Reviews Immunology*, Vol. 21 (2021), pp. 639–652.

common immunological mechanisms. Understanding these complex molecular and cellular pathways provides the scientific basis for targeted therapies, including antihistamines, intranasal corticosteroids, leukotriene receptor antagonists, biologics, and allergen-specific immunotherapy.⁵

4. Unani Concept of Allergic Rhinitis (Nazli and Zukav)

Allergic Rhinitis can be broadly correlated with the conditions of Unani medicine under the names of Nazli and Zukav in classical Unani Literature which describes the upper respiratory tract diseases due to disturbance in the Akhmat (humoral balance) of the body. In Unani medicine, health is achieved through balance of the four humours – Dam (blood), Balham (phlegm), Safra (Yellow bile) and Sauda (Black bile). When there is an imbalance, especially an excess or a change in the quality of Balham, it can cause symptoms that are very similar to allergic rhinitis, which include sneezing, nasal fluid production, nasal obstruction, headaches, a scratchy throat and watery eyes. The impact of environmental factors instigating the disruption of normal temperament (Mizan) of the respiratory system has been established and taken into account, such as cold, dust, pollen, smoke, season and dietary inaccuracies.⁶

Unani treatment of Nazli is holistic in nature and is more than just symptomatic; it tries to balance the humours and boosts the body's natural defines mechanisms (Quwan-e-Mabira-e-Badan). Treatment is given according to individual patient's temperament, severity of the disease and associated constitutional factors. Therapies include Ilaj bill Ghiz or diet therapy, whose principles include providing easily digestible foods and avoiding ales that are cold, diuretic and mucogenic; Ilaj bill Dawa or pharmacotherapy, which uses mostly herbal and mineral formulations with anti-inflammatory and expectorant properties and also with immunomodulatory properties; Ilaj bill Tad beer or regimental therapy, which refers to steam inhalation, massage, and other supportive therapy. Despite that

the terminologies have varied from the immunological concept dynamism, there are certain Unani interventions that exhibit anti-allergic, anti-oxidant, anti-inflammatory properties, tried in experimental and clinic studies. The incorporation of these traditional principles together with contemporary evidence-based ENT practice might be a complementary patient-centred approach to better control of symptoms, lower recurrence and overall quality of life.⁷

5. Diagnostic Approaches: Integrating Unani and Modern ENT Assessment

Just as with any other disease, the appropriate history prompt raises the possibility of infectious rhinitis, allergic rhinitis, vasomotor rhinitis, chronic rhinosinusitis and structural abnormalities of the nose. Clinical examination in ENT practice may include anterior rhinoscopy and nasal endoscopy to evaluate the nasal mucosa, inferior turbinate's, nose and nasal septum, nasal polyps and chronic inflammatory changes. Allergic rhinitis patients typically have paled bluish swollen nasal mucosa and a profuse nasal discharge with hypertrophied mucous turbinates. Regular examination of ears, throat and paranasal sinuses also is important as allergic rhinitis often occurs in association with sinusitis, otitis media with effusion and ETD.⁸

Selected patients may require computed tomography (CT) of the paranasal sinuses to assess any complications or associated sinonasal disease, but is not routinely recommended for uncomplicated allergic rhinitis. A state-of-the-art laboratory testing enhances diagnosis. There are numerous advantages to SPTs, including their low cost, speed of results, and high sensitivity, making them the preferred option for allergen sensitization. Serum-specific immunoglobulin E (IgE) antibodies should be measured when skin test is not possible or is not informative. Further tests such as peripheral blood eosinophil count, total serum IgE, eosinophil nasal smear and molecular allergy tests could be helpful in

⁵ Ibn Sina, *Al-Qanun fi al-Tibbs (The Canon of Medicine)* (English Trans., Hamdard University Press, New Delhi, 1998).

⁶ Hakim Ajmal Khan, *Mazique* (Central Council for Research in Unani Medicine, New Delhi, 2002).

⁷ Central Council for Research in Unani Medicine (CCRUM), *Standard Unani Treatment Guidelines* (Ministry of AYUSH, New Delhi, 2021).

⁸ Ministry of AYUSH, Government of India, *National Policy on AYUSH Systems of Medicine* (2022).

specific patients. This test is not only used to confirm allergic sensitization but can also help to devise strategies towards avoiding allergens and allergen-specific immunotherapy.⁹

In Unani system of medicine, the terms Mizan (temperament), Akhmat (humours) and complete clinical observation are used for its holistic diagnostic approach. The diagnostic process starts with the patient's constitutional temperament, diet, environmental and occupational stressors, seasonal factors and life style related to possible humoral imbalances. Symptoms are evaluated that correspond to Nazli and Zukam, like the character of nasal discharge, the number of sneezes that occur, headache, irritation in the throat and associated constitutional symptoms. With classical practice (Nabs – Pulse examination, Baul – Urine examination, Baraz – stool examination and visual examination) more information is gathered on the overall physiological state of the patient and the predominant presence of which humours.¹⁰

Integrative diagnostic is a combination of the best features of both systems that allow us to care for the patient individually. Allergic tests, Anatomical tests and Immunological tests by ENT are objective tests and help evaluate the allergy, Anatomical and Immunological abnormalities, while the Unani test help to assess the diathesis and risk factors related to one's life habits and offer perfect therapeutic strategies. This integration enables holistic assessment, enhances the accuracy of diagnosis, promotes preventive measures, and aids in tailored treatment plans. Combining the basis of evidence-based diagnostics with a holistic constitutional assessment enables the clinician to establish a treatment strategy that takes into account biological mechanisms of allergy and the overall condition of the patient.¹¹

6. Conventional Evidence-Based ENT

⁹ M. Small et al., "Burden of Allergic Rhinitis on Quality of Life," *Clinical and Experimental Allergy*, Vol. 48 (2018), pp. 98–108.

¹⁰ P. W. Hellings & G. W. Canonica, "United Airway Disease Concept," *Allergy*, Vol. 75 (2020), pp. 1121–1134.

¹¹ C. Bousquet et al., "Precision Medicine in Allergic Rhinitis," *Journal of Allergy and Clinical Immunology*, Vol. 147 (2021), pp. 1450–1461.

Management

In contemporary times, the focus of allergy treatment for allergic rhinitis is towards reduction of symptoms, enhanced quality of life, prevention of disease course and avoidance of complications using pharmacological and non-pharmacological treatments. Based on international clinical guidelines, treatment should be sequential depending on the degree of disease activity, the duration of the symptoms and the patient's age and comorbidities, as well as their response to previous treatment. Patient education and understanding of the chronic nature of allergic rhinitis, identification of triggering factors and compliance to treatment and allergy-proofing measures constitute the first part of management. These are key allergen avoidance strategies (in addition to pharmacological treatment) that help reduce exposure to animal dander, Mold, indoor dust mites, tobacco smoke, and air pollutants, which prevent allergies.¹²

They have good tolerability and very good efficacy, thus representing the best alternative therapy in the long term for persistent allergic rhinitis. The combined intranasal corticosteroid and antihistamine drugs are more effective for more severe cases, when used in combination with a single intranasal corticosteroid. Other drugs available include leukotrienes receptor antagonists e.g. montelukast especially those with underlying asthma or aspirin-exacerbated respiratory disease. Anticholinergic agents can be administered intranasally to help control excessive rhinorrhoeas while short-term topical nasal decongestants will alleviate itching and severe nasal obstruction. But long-term use of nasal decongestants is not recommended due to the potential for rhinitis medicamentosa. Saline nasal irrigation is becoming a more popular and safe nasal adjunctive therapy where it has been shown to have beneficial effect on mucociliary clearance, removal of allergens, hydration of nasal mucosa and effectiveness of topical medications.¹³

¹² S. Brozek et al., *ARIA Guidelines for Allergic Rhinitis*, European Academy of Allergy and Clinical Immunology, 2020.

¹³ A. Hossen et al., "Medicinal Plants Used in Allergic Disorders," *Journal of Ethnopharmacology*, Vol. 250 (2020),

Allergen-specific immunotherapy is the only disease modifying treatment available for allergic rhinitis. Giving a series of standardized allergen extracts by injection or under the tongue makes the person slowly accept it as a non-threat and seems to produce long-term immunity. Immunotherapy has been shown to induce lasting symptom reduction, decreased medications use and progression to asthma and also showed better long term clinical outcomes. Successful treatment requires appropriate selection of the patient (based on confirmed allergen sensitization) and adequate monitoring for adverse reactions.¹⁴

Also, it is very important to manage other comorbidities in allergic rhinitis treatment, such as asthma, chronic rhinosinusitis, allergic conjunctivitis, obstructive sleep disturbances, and recurrent ear diseases. Ongoing follow-up allows healthcare providers to evaluate compliance with the treatment, measure symptoms' control status, pinpoint side effects and adjust treatment as needed in response to disease activity. Personal medicine is being integrated into therapeutic approaches which more and more are based on biomarker-directed selection of therapeutic interventions, digital health technologies and patient reported outcome measures are improving therapeutic decisions for the patient. In combination with established complementary modalities like Unani Medicine under proper scientific monitored guidance, modern ENT care can offer holistic, individual and long-term solution-oriented treatment for patient with allergic rhinitis.¹⁵

7. Unani Therapeutic Interventions

7.1 Ilaj bill Ghiz (Diet therapy)

As per basic principles of Unani medicine, Ilaj bill Ghiz (diet therapy) is most important among all types of treatment and considered as a primary treatment for many diseases like Nazli and Zukav (which is clinically synonymous with allergic rhinitis). According to Unani system, food is regarded not only as a source of food but food is also considered as

medicine to restore humoral balance (Akhmat), and maintenance of body's temperament (Mizan.). Recommendations are made on a case-by-case basis based on the patient's constitutional characteristics, the severity of the disease, the change of season and digestive qualities. Warm freshly prepared easily digestible food that improves digestion and eliminates excess phlegm (Balham) is usually advised to those who suffer from Allergic Rhinitis. Others are warm soups, herbal decoctions, honey, ginger, black pepper, garlic and other natural substances with expectorant, anti-inflammatory and anti-oxidative properties are used frequently. At the same time foods thought to contribute to phlegmatic disorders such as cold drinks, foods kept in the fridge, excessive dairy, oily foods, processed foods and food allergens are avoided. Good hydration and supplementation with antioxidant fruits and vegetables are recommended to provide support to immune function and support mucosa. The dietary guidelines offered in this section, based on traditional Unani concepts, align with contemporary nutritional strategies focusing on inflammation as a systemic disease and boosting immune responses.¹⁶

7.2 Ilaj bill Dawa (Pharmacotherapy)

Ilaj bill Dawa is pharmaceutical remedy through the use of natural medicinal substances, from plants, minerals and animals. In allergic rhinitis, Unani physicians prescribe formulation that are indicated to decrease the inflammation, liquefaction of excessive mucous secretion, getting relief from nasal stuffiness and normalizing the humoral balance. Many of the commonly used medicinal plants exhibit experimentally proven anti-inflammatory, antioxidant, antihistaminic, bronchodilator and immunomodulatory properties, including Glycyrrhiza glabra (Licorice), Piper longum, Adatia vesical, Viola odorata, Zingiber officinale (Ginger) and Ocimum sanctum (Holy Basil). Balanced classical compound formulations are carefully selected by keeping in mind the temperament and symptom complex of the patient. Recent pharmacological studies have found various bioactive components in these herbs to include flavonoids, phenolics,

Article 112453.

¹⁴ S. M. Gilani & A. Rahman, "Pharmacological Basis of Unani Herbal Medicines," *Phytotherapy Research*, Vol. 34 (2020), pp. 1105–1122.

¹⁵ H. Wagner & S. Ulrich-Merzenich, "Synergy Research in Herbal Medicine," *Phytomedicine*, Vol. 16 (2009), pp. 97–110

¹⁶ P. Barnes, *Mechanisms of Allergic Inflammation* (Academic Press, London, 2019).

alkaloids, terpenoids, and essential oils, which have anti-inflammatory, anti-oxidative, and immune modulating properties. While some of the evidence is favourable, there is a need for the standardisation of herbal formulations/plant-drugs, dosing programs, quality control procedures and large-scale, randomised clinical trials in order to confirm efficacy and safety as per current scientific criteria.¹⁷

7.3 Ilaj Bil Tad beer (Regimenal Therapy)

Ilaj Bil Tad beer or regimental therapy is the collection of non-pharmacological interventions that help to bring back the normal physiological function and improve the body's natural healing potential. Treatment of allergic rhinitis can be done in 2 different ways: regimental and graduated theophylline. Regimental treatment involves steam inhalation (Inqilab), gentle massage (Dalek), exercise, controlled exercises, adequate sleep, breathing exercises, environmental hygiene and seasonal changes. The use of steam inhalation is common to help break up nasal discharges, clear the mucociliary apparatus, relieve nasal congestion and help breathing. Minimize the risk of exposure to cold temperatures, dust, pollen and smoke; have a healthy daily schedule to boost immunity; maintain clean indoor space. Psychological health also has been analysed as a significant factor, since it is thought to cause derangements in humoral balance led to susceptibility towards diseases. Many of these regimental approaches are very similar to current supportive therapies used today for ENT patients: Saline irrigation, environment avoidance of allergens, respiratory exercises and patient education. In conclusion, Ilaj bill Tad beer is thus an useful complementary treatment to an integrative approach in managing allergic rhinitis.¹⁸

8. Scientific Evidence Supporting Unani Interventions

The rising scientific interest and research on traditional medicine has resulted in more evaluation of Unani therapeutic interventions based on modern

pharmacological and clinical parameters. Many experimental studies have been conducted confirming that medicinal plants which are commonly used in Unani medicine have remarkable anti-inflammatory, antioxidant, antihistaminic, antimicrobial and immunomodulatory activities that could be of help in allergic rhinitis. Active phytochemicals like flavonoids, polyphenols, alkaloids, terpenoids, glycosides and volatile oils have been found to interfere with the release of histamine, inhibit the secretion of pro-inflammatory cytokines, decrease eosinophilic infiltration, stabilize mast cells, and regulate oxidative stress.¹⁹

The biological activities are similar to the immunopathological mechanism involved in allergic rhinitis which gives scientific rationale of the use of these herbal medicines. Extensive clinical evidence in favour of Unani intervention is gradually augmenting through observation studies, pilot clinical trials, and comparative therapeutic studies. Treatment of selected Unani herbal formulations and regimental therapies have been reported to yield some benefits in nasal obstruction, sneezing, rhinorrhoeas, nasal itching, improvement in sleep quality and overall quality of life in several studies. Some herbal medications have shown to be safe, with few negative side effects relative to long-term use of prescription medications. However, the clinical evidence that is available is quite varied, owing in part to differences in how the studies are conducted, their size, treatment duration, the standardisation of formulations, outcome measures and methodological quality.²⁰

As a result, the results of systematic reviews are often that initial results are encouraging but more rigorous scientific evidence is needed before broad clinical recommendations can be taken forward. The scientific evaluation of Unani medicine has now been further strengthened with the recent developments in the field of Phytochemistry, molecular biology and immunology. Several bioactive molecules have been discovered through lab research that can modulate the

¹⁷ M. A. Kainer, "Management of Allergic Rhinitis," *Immunology and Allergy Clinics of North America*, Vol. 36 (2019), pp. 235–248.

¹⁸ G. Scadding et al., "EAACI Position Paper on Allergic Rhinitis," *Allergy*, Vol. 75 (2020), pp. 1462–1482.

¹⁹ National Institute for Health and Care Excellence (NICE), *Allergic Rhinitis: Diagnosis and Management* (London, 2021).

²⁰ American Academy of Otolaryngology–Head and Neck Surgery, *Clinical Practice Guideline: Allergic Rhinitis* (2015, updated recommendations).

activity of NF- κ B, production of cyclooxygenase pathways, production of interleukins, oxidative stress markers and IgE-mediated immune response. The findings reflect the potential of Unani therapies to have therapeutic effects through several complimentary pathways instead of a single pharmacological target.²¹

9. Comparative Analysis of Unani and Modern ENT Therapeutics

Allergic Rhinitis has been a disease that has undergone significant changes over the years with advancements in immunology, pharmacology and evidence based clinical practice. The current otorhinolaryngological (ENT) medicine puts increased emphasis on scientifically and proven-based methods that are supported by a correct diagnosis, identification of allergen sensitization, pharmacotherapy, and prevention. Second generation anti-histamines, leukotriene receptor antagonists, nasal saline's, nasal steroids, and allergen-specific immunotherapy are the treatment that have been proven effective by large-scale randomized controlled trials and by international clinical guidelines. These interventions are used to alleviate symptoms, decrease inflammation in the nose, enhance quality of life and limit disease development. While medication dependence is not a problem long term, some drugs can cause problems with the nose (dry nose, nosebleeds), may make patients sleepy when using some of the drugs, and some patients do not take them as prescribed; long-term use of these medicines is also an economic burden.²²

In addition, traditional medicine tends to just manage the symptoms and the immune processes and not tackle issues that could contribute to greater susceptibility to disease through constitutional and lifestyle changes. The Unani medicine, however, treats allergic rhinitis in an integrated manner, links the condition to Nazli and Zukav which are said to be due to the disorder of humoral fluid balance of the body (Akhmat) and its constitutional temperament

(Mizan). The goal of therapy is not only to suppress the symptoms, but to restore physiologic balance and improve the body's ability to heal itself (Quwan-e-Mabira-e-Badan). These therapeutic considerations include the use of diet (Ilaj bill Ghiz), herbs (Ilaj bill Dawa) and therapeutic regimen (Ilaj bill Tad beer) specific to each patient's constitution. Several medicinal plants extensively used in Unani medicine has been found experimentally to show anti-inflammatory, antioxidant, antihistaminic and immunomodulatory properties that could further support the potential biological activity and thus modern pharmacological approaches.²³

Moreover, the study of Unani medicine involves lifestyle modification, environmental hygiene, stress alleviation and preventive health care, which also helps in creating a gradual effect for improved health in the long run. These complementary strengths do not imply superiority in the other of the two systems; there are some disadvantages to both. Although the medical practice of ENT medicine enabled a great deal of scientific evidence, it could not be used in other based on the standardized treatment protocol and precise diagnostic technique, it is not suitable for every individual's associated factor of constitution and long-term lifestyle.

On the other hand, Unani medicine has its customization and holistic approach but still requires more standardization of Unani herbal formulation, maintaining solid quality control, pharmacovigilance and good quality RTCs to create more evidence for solid clinical acceptance. So, it is not an either/or situation, but an either-and situation, the two systems being complementary, not competitive models. Combining evidence-based pharmacological treatments with validated Unani dietetic, herbal and regimental treatments can lead to more effective symptom control, less medication dependence, more adherence and holistic, patient-centred care. Such comparative study emphasizes the need for cross-disciplinary work between ENT, Unani Doctors, Pharmacologists, and clinical researchers for formulation of scientifically acceptable integrated

²¹ S. R. Durham & H. J. Nelson, *Allergen Immunotherapy: Current Concepts* (Oxford University Press, Oxford, 2019).

²² CCRUM, *Medicinal Plants in Unani System of Medicine*, Vol. I (New Delhi, 2018).

²³ Ministry of AYUSH, *Ayurveda, Yoga, Unani, Siddha and Homeopathy Research Policy* (2020).

approach therapy protocols.²⁴

10. Integrative Clinical Management Model

In allergic rhinitis, combining the two most fundamental elements of Unani medicine (an integrated holistic concept) with the evidence-based approach of ENT medicine forms an integrative clinical management model which focuses on treating the patient as a whole and thus results a personalized, safe and patient oriented management. The proposed model includes a detailed diagnosis, which involves modern ENT diagnosis (clinical history, physical examination, nasal endoscopy, skin prick testing or serum-specific IgE test) followed by Unani diagnosis of Mizan (temperament), Akhmat (humoral balance), diet, environment, and lifestyle. This dual evaluation will allow the clinician to recognise that both immunological processes involved in allergic inflammation and constitutional factors that can affect the susceptibility of the disease, its recurrence and how well it will respond to treatment are identified.²⁵

The following is a robust assessment that underpin and underlies personalized or tailored therapy but not one size fits all therapy. As per the severity of the disease and patients' characteristics this therapeutic part of the integrative approach incorporates the evidence-based conventional pharmacotherapy along with well selected Unani intervention. Acute – taking place during a changing phase, medications like intranasal steroids, 2nd Technology Antihistamines, saline nasal irrigation, and leukotriene receptor antagonists can immediately relieve inflammation and allergic symptoms. Complementary approaches may include Unani dietary modifications, scientifically evidence-based herbal remedies, regimental therapy—including steam inhalation, breathing exercises and optimizing lifestyle—to help regulate the immune system, alleviate oxidative stress, maintain a healthy mouth and improve overall well-being. Patient education on allergen avoidance, environmental hygiene, dietary advice, stress management, smoking and treatment compliance is

an essential part of a long-term approach to disease management.

Regular follow-up evaluations of symptom severity, quality of life, medication needs and side effects monitor progress and facilitate adjustments to therapy as needed. The effective implementation of this model needs a joint effort of all concerned such as ENT specialists, Unani doctors, immunologist, pharmacologist, nutritionists and primary care givers. To ensure safety, efficacy, and quality assurance, standardized herbal composition, evidence-based clinical protocols, pharmacovigilance systems, and the regulatory oversight of herbs play a key role. Adoption of precision medicine, digital health technologies, biomarkers of allergic inflammation and artificial intelligence based clinical decision support offer promising potential to further leverage personalized treatment strategies. Therefore, an evidence-based integrative clinical management approach could contribute to better symptom control, decrease in allergic rhinitis reappearance, increased patient satisfaction, less unnecessary MedDRA usage and to an overall approach towards the management of allergic rhinitis with adherence to scientific rigor invited for the contemporary HealthCare practice.²⁶

11. Challenges, Safety Considerations, and Regulatory Issues

The combination of Unani and the modern evidence-based ENT with the concept of Allergic Rhinitis (AR) is a huge opportunity but it also carries some clinical, scientific and regulatory challenges. The lack of good randomized controlled trials assessing long-term efficacy and safety data of various Unani formulations, which is one of the main concerns, is a major challenge in providing health care benefit to people. One of the principal issues concerns limited studies on efficacy of many Unani formulations and the lack of secure long-term safety data, which is a major challenge in health care beneficence provision to people. Therapeutic efficacy may vary due to variability in herbal composition, growing techniques, processing and standardization of the dose. Moreover, the possibility of herb–drug

²⁴ M. Heinrich et al., *Fundamentals of Pharmacognosy and Phytotherapy* (3rd ed., Elsevier, London, 2022).

²⁵ A. K. Khare, *Indian Medicinal Plants: An Illustrated Dictionary* (Springer, New York, 2007).

²⁶ G. Cragg & D. Newman, "Natural Products in Drug Discovery," *Biochemical et Biophysical Acta*, Vol. 1830 (2013), pp. 3670–3695.

interactions must be considered, especially when patients are taking antihistamines, corticosteroids, leukotriene receptor antagonists (LTRAs) or immunotherapy. It is important to ensure patient safety through the quality assurance process, authentication of Raw Medicinal Materials, contamination of materials by heavy metals, pesticides or microbial impurities, and through the application of Good Manufacturing Practices (GMP). The proper pharmacovigilance systems should also be set up that monitor such adverse events and enhance the post-marketing surveillance of traditional medicines.

Regulatory safety nets are important to enable Unani medicine as part of contemporary medicine. There is a need to establish evidence-based guidelines to standardize, license, evaluate quality and clinical parameters of Unani formulations by national authorities and facilitate interdisciplinary integration between Unani physicians, ENT surgeons, pharmacologists and researchers. The ethical considerations, informed patient consent and communication of benefits and limitations to integrative therapies are also of major importance. Nesting of multi-centre clinical trials, research in pharma sciences, refining standardised treatments and global standardisation of regulatory practices would boost the scientific acceptance of Unani medicine. Overcoming these challenges will help in integrating traditional Unani therapeutics into modern-day management of allergic rhinitis with accuracy, safety, and evidence-based healthcare practices.²⁷

²⁷ R. Patankar, "Global Epidemiology of Allergic Diseases," *Asia Pacific Allergy*, Vol. 10 (2020), e29.

Table 11.1: Challenges, Safety Considerations, and Regulatory Issues in Integrative Management of Allergic Rhinitis

Aspect	Challenge	Recommended Strategy
Clinical evidence	Limited high-quality randomized controlled trials	Conduct multicentre, well-designed clinical studies
Herbal standardization	Variability in composition, dosage, and preparation methods	Standardize formulations and establish quality specifications
Safety	Risk of herb–drug interactions and adverse reactions	Careful patient assessment and clinical monitoring
Quality control	Contamination with heavy metals, pesticides, or microbes	Implement Good Manufacturing Practices (GMP) and rigorous testing
Pharmacovigilance	Inadequate reporting of adverse events	Establish robust monitoring and reporting systems
Regulation	Lack of harmonized regulatory guidelines	Develop evidence-based national and international regulations
Professional collaboration	Limited interaction between Unani and ENT practitioners	Promote multidisciplinary clinical practice and research
Patient awareness	Misconceptions regarding traditional and modern therapies	Provide evidence-based patient education and informed consent
Research infrastructure	Insufficient funding and collaborative research	Encourage interdisciplinary and translational research initiatives
Future integration	Limited incorporation into mainstream healthcare	Develop validated integrative clinical guidelines and policy support

12. Future Research Directions

Therefore, strong scientific validation of the therapeutic potential of Unani medicine in terms of present evidence-based ENT practice is the future of integrative management of allergic rhinitis. Though, the initial experimental and clinical observations highlight the therapeutic potentials of various Unani medicinal plants in the aspects of anti-inflammatory, anti-histaminic, antioxidant, and immunomodulatory effects, the reported antiprosaspiratory studies are limited due to small sizes of study groups, dispersion of methodologies, inconsistent herbal formulations, and brief follow up periods. Hence, larger scale multi-cantered Randomized Controlled Trials with standardized Unani therapy and placebo with conventional therapy are needed in the future. These studies should be done using the accepted clinical outcome measures, including symptom severity scores, quality-of-life indices, markers of allergic

inflammation, long-term safety evaluation, etc. to demonstrate robust evidence for clinical practice. Further studies are recommended that involve characterization of phytochemical compounds, the mechanism of action of the effect, pharmacokinetics, toxicological study, and quality assurance of the Unani formulations.²⁸

Molecular biology, genomics, metabolomics, proteomics, and systems pharmacology offer the opportunities to find bioactive compounds and elucidate their functions in regulating IgE-mediated allergic response, inflammatory cytokines and oxidative stress, as well as immune pathways. Interdisciplinary research efforts comprising Unani doctors, ENT, pharmacologists, immunologists, botanists, and public health professionals can pave

²⁸ D. E. Golan et al., *Principles of Pharmacology* (5th ed., Wolters Kluwer, Philadelphia, 2021).

the way for the standardized treatment protocols and evidence-based clinical guidelines. Further, the cost-effectiveness of integrative management, patient-reported outcomes, digital health interventions, precision medicine approaches and artificial intelligence supported clinical decision support systems should be assessed. The integration of traditional and modern medicine in allergic rhinitis will become more apparent with the help of modern medicine research development and the collaborative efforts of international organizations, harmonization of rules and regulations and increased investment in the study of traditional medicine.²⁹

13. Conclusion

Despite its increasing prevalence, Allergic Rhinitis remains one of the most common chronic inflammatory diseases, resulting in significant clinical, social and economic consequences for patients and health systems. Although modern evidence-based ENT practice offers effective means of diagnosis and scientifically-validated treatment with medicines, numerous patients still have ongoing symptoms, recurring disease, and a diminished quality of life, with unwanted side effects of the medicines. These challenges have been fuelling an increased interest in complementary and integrative modalities that do not only treat or tame the symptoms of disease but also the whole constitutional, environmental and lifestyle factors that can help prevent or drive the disease.

Unani medicine adopts a holistic approach with principles like Ilaj bill Ghiz, Ilaj bill Dawa, and Ilaj bill Tad beer, all of which seek to achieve equilibrium of humours, bolster the immune system functions of the body and foster a state of health. In recent years, some Unani medicinal plants have also emerged with anti-inflammatory, antioxidant, antihistaminic and immunomodulatory effects which can be used alongside the conventional treatment of ENT diseases. From this study, it can be concluded that along with its own strengths, modern ENT medicine and Unani medicine have their own weakness and each medicine has its own merits and

demerits which can be merged to get complete treatment to the patient.

Medicine has contributed standardized diagnostics, guideline-based pharmacotherapy, and allergen specific immunotherapy while Unani medicine focused personalized remedies, lifestyle modification, dietetic regimen and holistic disease prevention.

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²⁹ B. N. Ames et al., "Oxidants, Antioxidants and Human Disease," *Proceedings of the National Academy of Sciences*, Vol. 90 (1993), pp. 7915–7922.

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