Available online on 15.07.2026 at ijmspr.com

International Journal of Medical Sciences and Pharma Research

Open Access to Medical Science and Pharma Research

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Open Access **Research Article**

Evaluation of abnormal phlegm (*Ghair Tabayi Balgham*) in Unani Medicine: A clinical and comparative study with contemporary biomedical perspectives

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Article Info:

Article History:

Received 04 April 2026
Reviewed 18 May 2026
Accepted 20 June 2026
Published 15 July 2026

Cite this article as:

Azam I, Kabir S, Ahmad U, Evaluation of abnormal phlegm (*Ghair Tabayi Balgham*) in Unani Medicine: A clinical and comparative study with contemporary biomedical perspectives, International Journal of Medical Sciences & Pharma Research, 2026; 12(2):25-36 *DOI: http://dx.doi.org/10.22270/ijmspr.v12i2.197*

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Abstract

Background: In Unani medicine, *Balgham* (phlegm) is one of the four fundamental humors responsible for maintaining tissue nourishment, lubrication, and physiological homeostasis. Alterations in its qualitative or quantitative characteristics result in *Ghair Tabayi Balgham* (abnormal phlegm), a pathological state traditionally implicated in the development of several chronic diseases. However, its relevance to contemporary biomedical concepts has not been comprehensively investigated.

Objective: To evaluate the concept of *Ghair Tabayi Balgham* through classical Unani literature, clinical observations, and comparison with current biomedical evidence.

Methods: A hospital-based observational descriptive study was conducted at the Department of Kulliyat-e-Tib, Aligarh Unani & Ayurvedic Medical College and ACN Hospital, Aligarh, from May 2024 to September 2025. Classical Unani texts were critically reviewed, and patients presenting with *Balghami* features underwent detailed clinical assessment based on established Unani diagnostic principles. The findings were interpreted in the context of contemporary biomedical literature.

Results: Eight classical variants of *Ghair Tabayi Balgham* were identified. Impaired digestion, diminished innate heat, sedentary lifestyle, and excessive intake of cold and moist foods emerged as the principal etiological factors. Clinical observations demonstrated associations with obesity, hypothyroidism, bronchial asthma, chronic bronchitis, arthritis, metabolic syndrome, and chronic fatigue. Patients managed with dietary modification, regimenal therapy, and Unani pharmacotherapy exhibited improvements in digestive function, respiratory symptoms, metabolic status, and overall well-being.

Conclusion: The findings indicate that *Ghair Tabayi Balgham* is a clinically meaningful pathological construct with notable similarities to metabolic, inflammatory, endocrine, and respiratory disorders recognized in modern medicine. Integrating classical Unani concepts with contemporary biomedical evidence may strengthen evidence-based Unani practice and facilitate future translational research in integrative healthcare.

Keywords: Unani medicine; *Ghair Tabayi Balgham; Balgham*; humoral theory; *Mizaj*; metabolic syndrome; chronic inflammation; integrative medicine.

Introduction

The Unani System of Medicine is among the oldest documented systems of healthcare and is founded upon the humoral doctrine established by the Greek physicians Hippocrates and Galen, which was subsequently refined by eminent Muslim scholars including Al-Razi, Ibn Sina (Avicenna), Ali ibn al-Abbas Al-Majusi, Rabban Al-Tabari, Ibn Rushd, and Ibn Al-Nafis[1,2,3-7]. According to this doctrine, maintenance of health depends upon the harmonious equilibrium of four primary humors (*Akhlat*): *Dam* (blood), *Balgham* (phlegm), *Safra* (yellow bile), and *Sauda* (black bile). Any qualitative or quantitative disturbance in these humors produces *Su-e-Mizaj* (derangement of temperament), ultimately leading to disease[2,7].

Among these humors, *Balgham* possesses a naturally cold and moist (*Barid wa Ratab*) temperament and performs several indispensable physiological functions. Classical scholars described it as a partially matured nutritive substance derived during hepatic digestion that serves as a reserve material for blood formation while simultaneously maintaining tissue hydration, lubrication of joints, nourishment of delicate organs, and protection of nervous structures[2,4,8]. Unlike the common biomedical interpretation of phlegm as a respiratory secretion, the Unani concept encompasses a systemic physiological humor involved in nutrition, metabolism, and maintenance of homeostasis[8].

Under normal physiological conditions, *Balgham* undergoes further maturation and may be converted into blood whenever additional nourishment is required. However, defective digestion (*Su-e-Hazm*), diminished digestive power (*Quwwat-e-Hazima*), impaired hepatic metabolism, reduced innate heat *(Hararat-e-Ghariziyyah*), sedentary habits, inappropriate dietary

practices, advancing age, and environmental influences may interfere with normal humor formation, resulting in the production of *Ghair Tabayi Balgham*[2,4,5,8]. This pathological humor differs considerably from normal Balgham in its consistency, viscosity, colour, odour, taste, and biological properties. Classical Unani physicians regarded these abnormal forms as major pathogenic factors responsible for obstruction (*Sudda*), chronic inflammation, impaired nutrition, organ dysfunction, and accumulation of morbid materials (*Mawad-e-Fasida*)[2,4,5].

Ibn Sina, in Al-Qanun fi Al-Tibb, described abnormal phlegm as an incompletely processed humor generated due to defective digestion and weakened hepatic function. He emphasized that excessive accumulation of pathological *Balgham* predisposes individuals to obesity, chronic catarrh, respiratory diseases, digestive disorders, musculoskeletal diseases, generalized weakness, and cognitive sluggishness[2]. Likewise, Al-Razi attributed excessive phlegmatic disorders to overconsumption of cold and moist foods, physical inactivity, aging, and diminished digestive efficiency[3]. Al-Majusi further highlighted that disturbances in hepatic metabolism result in degeneration of humoral quality and advocated dietary regulation together with regimental therapies to restore physiological equilibrium[4]. Similar descriptions are found in Firdaus Al-Hikmah by Rabban Al-Tabari and Kulliyat-e-Nafisi, both of which emphasize the influence of environmental factors, seasonal variations, and lifestyle on phlegmatic disorders[5,6].

Classical Unani literature classifies abnormal phlegm into eight principal varieties according to its physical characteristics and pathological behaviour, namely *Balgham Mukhati* (Mucoidal), *Balgham Kham* (Raw), *Balgham Ma'i* (Watery), *Balgham Jissee* (Gypsoid), *Balgham Maleeh* (Salty), *Balgham Hamid* (Acidic), *Balgham Aafis* (Acrid), and *Balgham Zujaji* (Glassy)[2]. These distinct varieties exhibit characteristic clinical manifestations depending upon their composition and anatomical distribution, demonstrating the remarkable observational skills of medieval Unani physicians.

Modern biomedical science has increasingly recognized the importance of chronic inflammation, metabolic dysfunction, endocrine imbalance, oxidative stress, and excessive mucus production in the development of numerous chronic diseases[9–12]. Respiratory disorders such as bronchial asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), allergic rhinitis, and chronic rhinosinusitis are characterized by excessive mucus secretion, altered mucin composition, impaired mucociliary clearance, epithelial inflammation, and persistent immune activation[9–11]. Interestingly, these pathophysiological mechanisms closely resemble the classical Unani description of thick, adhesive, and obstructive forms of abnormal phlegm.

Similarly, obesity and metabolic syndrome have emerged as global public health challenges and are characterized by chronic low-grade inflammation, insulin resistance, altered adipokine secretion, impaired lipid metabolism, oxidative stress, and reduced energy expenditure[13]. These metabolic abnormalities parallel the Unani concepts of diminished *Hararat-e-Ghariziyyah*, impaired digestion, and excessive accumulation of cold and moist humors. Patients with hypothyroidism likewise present with cold intolerance, lethargy, weight gain, constipation, cognitive slowing, reduced basal metabolic rate, and generalized weakness, clinical manifestations remarkably consistent with the traditional description of *Balghami* predominance[14].

Recent advances in mucosal immunology have further demonstrated that mucus is a highly specialized biological secretion composed primarily of water, mucins, glycoproteins, electrolytes, antimicrobial peptides, immunoglobulins, enzymes, and cellular debris[10,11]. Under physiological conditions, mucus protects epithelial surfaces and contributes to innate immunity; however, pathological alterations in mucus composition, viscosity, and clearance contribute significantly to chronic airway inflammation and infection[11]. These findings support the traditional Unani understanding that qualitative changes in phlegm rather than its mere presence determine pathological outcomes.

Clinical observations in contemporary Unani practice also indicate that patients exhibiting *Balghami Mizaj* frequently present with obesity, hypothyroidism, arthritis, chronic bronchitis, bronchial asthma, allergic disorders, poor digestion, generalized heaviness, lethargy, reduced physical activity, and chronic fatigue. These observations suggest that the traditional concept of abnormal phlegm may represent a comprehensive systemic disorder involving metabolic, inflammatory, endocrine, neurological, and respiratory dysfunction rather than an isolated respiratory abnormality[15].

Despite increasing global interest in traditional systems of medicine and integrative healthcare, scientific evaluation of *Ghair Tabayi Balgham* remains limited. Most available publications emphasize theoretical explanations of humoral pathology without integrating contemporary biomedical mechanisms or clinical observations. Consequently, significant opportunities remain for establishing meaningful correlations between classical Unani concepts and modern pathophysiological understanding.

The present study was therefore undertaken to comprehensively evaluate the concept of *Ghair Tabayi Balgham* through critical analysis of classical Unani literature, hospital-based clinical observations, and comparative interpretation with current biomedical evidence. Such integration may strengthen the scientific basis of Unani medicine, promote evidence-based traditional healthcare, and provide novel perspectives for the prevention and management of chronic lifestyle-related disorders.

Materials and Methods

Study design

The present investigation was designed as a hospital-based observational, descriptive, and comparative study to evaluate the Unani concept of *Ghair Tabayi Balgham* (abnormal phlegm) through an integrated assessment of

classical literature, clinical observations, and contemporary biomedical evidence. The study employed a mixed-method approach that combined qualitative analysis of classical Unani texts with descriptive clinical evaluation of patients presenting with *Balghami* features. This integrative design facilitated a comprehensive understanding of the etiopathogenesis, clinical manifestations, and therapeutic relevance of abnormal phlegm in relation to modern concepts of chronic metabolic, inflammatory, endocrine, and respiratory diseases.[16–21]

Study setting

The study was conducted at the Department of Kulliyat-e-Tib, Aligarh Unani & Ayurvedic Medical College and ACN Hospital, Aligarh, Uttar Pradesh, India, a tertiary care teaching hospital providing outpatient and inpatient Unani healthcare services. The institution receives patients from urban and rural populations with diverse socioeconomic backgrounds, allowing observation of a wide spectrum of *Balghami* disorders.

Study duration

The study was carried out over a 17-month period from May 2024 to September 2025. During this period, literature review, patient recruitment, clinical evaluation, and comparative biomedical analysis were performed concurrently to ensure consistency between theoretical concepts and clinical observations.

Study population

The study included adult patients attending the Unani Outpatient Department (OPD) who exhibited clinical features suggestive of *Balghami Mizaj* or disorders traditionally associated with *Ghair Tabayi Balgham*. Patients were selected using a purposive sampling method based on predefined eligibility criteria.[31]

Inclusion and exclusion criteria

Adult patients aged between 18 and 70 years attending the Unani Outpatient Department (OPD) were considered eligible for inclusion in the study if they exhibited one or more clinical features suggestive of *Balghami* predominance. These features included obesity, lethargy, generalized heaviness, cold intolerance, excessive mucus production, chronic productive cough, sluggish digestion, poor appetite, joint pain and stiffness, fatigue, and reduced physical activity. Only those individuals who were willing to participate voluntarily and provided written informed consent were enrolled in the study.[26,28,29]

Patients were excluded if they were younger than 18 years of age, pregnant or lactating women, or those requiring emergency medical care. Individuals diagnosed with malignancy, severe hepatic, renal, or cardiac failure, as well as those suffering from severe psychiatric illness, were also excluded from the study. Furthermore, patients who were unwilling to participate or declined to provide written informed consent were not included in the study.[28,29]

Literature review

A comprehensive review of classical and contemporary literature was undertaken to establish the theoretical framework of the study.[16–25]

Classical Unani sources

A comprehensive review of classical Unani literature was undertaken to establish the theoretical foundation of the present study. The principal sources consulted included Al-Qanun fi Al-Tibb by Ibn Sina (Avicenna), Al-Hawi fi Al-Tibb by Al-Razi, Kamil Al-Sina'ah Al-Tibbiyyah by Ali ibn Al-Abbas al-Majusi, Firdaus al-Hikmah by Rabban Al-Tabari, Kitab Al-Kulliyat fi Al-Tibb by Ibn Rushd (Averroes), and Kulliyat-e-Nafisi by Ibn Al-Nafis. In addition, standard publications of the Central Council for Research in Unani Medicine (CCRUM), along with recognized textbooks on Unani pharmacology (*Ilmul Advia*) and pathology (*Ilmul Amraz*), were extensively reviewed. These classical and contemporary references provided detailed information on the concept of *Balgham* and Ghair Taba'i Balgham, including their definition, physiological functions, formation, classification, etiopathogenesis, clinical manifestations, diagnosis, and principles of management according to Unani medicine.[16–25]

The literature review focused on:

The literature review primarily focused on the definition and physiological role of *Balgham*, its formation and maturation under normal physiological conditions, and the classical classification of *Ghair Tabayi Balgham* (Abnormal Phlegm). It further examined the etiological factors responsible for the development of abnormal phlegm, its pathogenesis, and the various clinical manifestations described by eminent Unani physicians. In addition, the review explored the classical principles of diagnosis based on Unani concepts of *Mizaj, Akhlat*, and *Hararat-e-Ghariziyyah*, as well as the therapeutic strategies recommended for the management of Balghami disorders, including *Ilaj bil Ghiza* (dietotherapy), *Ilaj bil Tadbeer* (regimental therapy), and *Ilaj bil Dawa* (pharmacotherapy). This comprehensive review provided the theoretical framework for correlating the traditional Unani understanding of *Ghair Tabayi Balgham* with contemporary biomedical concepts and clinical observations[16–25].

Contemporary biomedical literature

To establish a scientific correlation between classical Unani concepts and contemporary medical knowledge, an extensive review of peer-reviewed biomedical literature was conducted. Relevant articles were retrieved from internationally recognized electronic databases, including PubMed, Scopus, Web of Science, Google Scholar, and ScienceDirect. The literature search focused on current evidence related to obesity, metabolic syndrome, chronic inflammation, hypothyroidism, bronchial asthma, chronic bronchitis, mucosal immunology, oxidative stress, and other lifestyle-related disorders. Particular emphasis was placed on studies investigating the pathophysiological mechanisms underlying metabolic dysfunction, immune dysregulation, excessive mucus production, and chronic inflammatory processes. To ensure the relevance and

scientific validity of the review, publications from the last decade were prioritized, while landmark studies of historical significance were also included where appropriate. This comprehensive review facilitated a meaningful comparison between the traditional Unani understanding of *Ghair Tabayi Balgham* (Abnormal Phlegm) and contemporary biomedical concepts, thereby providing an evidence-based framework for interpreting the clinical observations of the present study[26–35].

Clinical evaluation

Each participant underwent a comprehensive clinical assessment using both conventional medical examination and traditional Unani diagnostic methods[31,34].

Demographic assessment

A detailed demographic profile of each participant was recorded using a structured case record form. The information collected included age, gender, occupation, place of residence, socioeconomic status, and educational background. These demographic variables were documented to characterize the study population and to evaluate their potential association with the occurrence of *Balghami* disorders and the development of *Ghair Tabayi Balgham*[31].

Medical history

A comprehensive medical history was obtained from each participant through direct interview and review of available medical records. The recorded information included the presenting complaints, duration of illness, dietary habits, physical activity, sleep pattern, bowel habits, history of addiction, previous medical illnesses, family history, drug history, and the presence of associated comorbidities. Particular attention was given to lifestyle factors, dietary practices, and past medical conditions that could contribute to the development of Balg*h*ami disorders and humoral imbalance according to Unani principles[16–25,34].

General Physical Examination

All participants underwent a thorough general physical examination conducted according to standard clinical procedures. The examination included measurement of height, body weight, and body mass index (BMI), along with assessment of pulse rate, blood pressure, respiratory rate, and body temperature. In addition, the general appearance, nutritional status, and the presence of edema were evaluated. A systematic respiratory examination was performed to identify signs such as wheezing, crepitations, or excessive mucus production, while a musculoskeletal examination assessed joint pain, stiffness, swelling, and limitation of movement. Whenever clinically indicated, available laboratory investigations, including thyroid function tests, fasting blood glucose, lipid profile, and complete blood count (CBC), were reviewed from the patients' medical records to support the clinical diagnosis and facilitate correlation between Unani clinical findings and contemporary biomedical parameters[26,27,34].

Unani clinical assessment

All participants were evaluated according to the established diagnostic principles of the Unani System of Medicine to assess the presence and severity of *Ghair Tabayi Balgham* (abnormal phlegm). The clinical assessment included evaluation of the individual's *Mizaj* (temperament), the nature and predominance of *Akhlat* (humors), *Quwwat-e-Hazima* (digestive power), *Hararat-e-Ghariziyyah* (innate heat), and the presence of *Su-e-Hazm* (indigestion). Particular emphasis was placed on assessing the quality and quantity of *Balgham*, identifying signs of *Sudda* (obstruction), and evaluating lifestyle-related factors such as dietary habits, physical inactivity, and seasonal influences that could contribute to humoral imbalance. In addition, patients were carefully examined for the classical manifestations of abnormal phlegm, including excessive mucus production, generalized heaviness, lethargy, cold intolerance, obesity, sluggish digestion, respiratory obstruction, and chronic joint pain and stiffness. This comprehensive Unani clinical assessment facilitated the identification of *Balghami* predominance and enabled correlation of traditional diagnostic findings with contemporary biomedical concepts[16–25,34].

Comparative biomedical analysis

The clinical findings observed during the study were critically compared with contemporary biomedical concepts to explore potential correlations between the Unani concept of *Ghair Tabayi Balgham* and the pathophysiological mechanisms underlying chronic non-communicable diseases. A comprehensive review of current scientific literature was undertaken to identify similarities between classical Unani descriptions of humoral imbalance and modern biomedical understanding of disease processes. The comparative analysis included disorders such as obesity, metabolic syndrome, type 2 diabetes mellitus, hypothyroidism, bronchial asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), osteoarthritis, rheumatoid arthritis, allergic rhinitis, and chronic fatigue syndrome. Particular emphasis was placed on evaluating common pathophysiological features, including metabolic dysfunction, chronic low-grade inflammation, immune dysregulation, oxidative stress, endocrine abnormalities, excessive mucus production, impaired tissue metabolism, and lifestyle-related disease pathogenesis. This integrative approach facilitated a meaningful comparison between traditional Unani humoral pathology and contemporary biomedical evidence, thereby providing a scientific framework for understanding the clinical relevance of *Ghair Tabayi Balgham* in the context of modern lifestyle-related disorders[26–35].

Therapeutic Evaluation

Patients receiving Unani treatment were prospectively observed for clinical improvement following the fundamental therapeutic principles of the Unani System of Medicine, namely *Ilaj bil Tadbeer* (Regimental Therapy), *Ilaj bil Ghiza* (Dietotherapy), and *Ilaj bil Dawa* (Pharmacotherapy). The treatment regimen was

individualized according to the patient's Mizaj (temperament), severity of disease, and associated clinical manifestations[16-25,30].

Ilaj bil Tadbeer (Regimental Therapy)

Ilaj bil Tadbeer (Regimental Therapy) comprised non-pharmacological interventions aimed at restoring humoral balance and improving metabolic function. The principal regimental measures included *Riyazat* (exercise) to enhance physical activity and metabolic efficiency, *Hammam* (steam bath) to facilitate elimination of morbid humors and improve circulation, and *Hijamah* (cupping therapy) to promote detoxification and relieve musculoskeletal symptoms. These interventions were prescribed according to the individual patient's temperament, disease severity, and overall clinical condition[16–25,30].

Ilaj bil Ghiza (Dietotherapy)

Ilaj bil Ghiza (Dietotherapy) emphasized dietary modification as an essential component of treatment. Patients were advised to avoid foods considered to aggravate *Balghami* disorders, including cold foods, refrigerated beverages, excessive milk, yogurt, rice, heavy oily meals, and excessive sweets, as these were believed to promote the formation and accumulation of abnormal phlegm. Conversely, they were encouraged to consume warm, freshly prepared meals, easily digestible foods, a high-fiber diet, moderate amounts of protein, herbal decoctions, and warm water, in accordance with classical Unani dietary principles to improve digestion, enhance innate heat, and restore humoral equilibrium[16,25].

Ilaj bil Dawa (Pharmacotherapy)

Ilaj bil Dawa (Pharmacotherapy) involved the administration of selected Unani medicinal herbs possessing *Muhallil* (anti-inflammatory), *Munzij* (concoctive), Mulattif (demulcent), *Muqawwi-e-Meda* (stomachic), and *Muqawwi-e-Aasab* (nervine tonic) properties. Frequently prescribed herbs included *Zingiber officinale* (Zanjabeel), *Piper nigrum* (Filfil Siyah), Withania somnifera (Asgand), and *Lavandula stoechas* (Ustukhuddus), which are traditionally used to improve digestion, enhance metabolism, reduce excessive phlegm, strengthen vital organs, and promote overall health[23,24,30].

The therapeutic response was assessed clinically during follow-up visits by evaluating changes in appetite, mucus production, digestive function, physical activity, fatigue, respiratory symptoms, joint pain and stiffness, and overall quality of life. Improvement in these parameters was considered indicative of restoration of humoral balance and clinical recovery, thereby supporting the therapeutic effectiveness of the Unani treatment modalities employed in the present study[30,31].

Results

The present hospital-based observational study comprehensively evaluated the concept of *Ghair Tabayi Balgham* (abnormal phlegm) through critical analysis of classical Unani literature and clinical observations recorded among patients attending the Department of Kulliyat-e-Tib, Aligarh Unani & Ayurvedic Medical College and ACN Hospital. The findings demonstrated that qualitative and quantitative alterations in *Balgham* are strongly associated with chronic metabolic, endocrine, respiratory, musculoskeletal, and neurological disorders. Furthermore, substantial similarities were observed between the classical descriptions of abnormal phlegm and contemporary biomedical concepts related to chronic inflammation, metabolic dysfunction, endocrine imbalance, and mucus hypersecretion.

Classical classification of *Ghair Tabayi Balgham*

Review of authoritative Unani texts confirmed that *Ghair Tabayi Balgham* is classified into eight major varieties according to its physical characteristics, pathological behavior, and clinical manifestations. Each variety demonstrates distinct organ involvement and symptomatology.

Table 1: Classical classification of *Ghair Tabayi Balgham*

Type of Abnormal Phlegm	Classical Characteristics	Probable Clinical Correlation
Balgham Mukhati	Thick, sticky, mucoid	Chronic bronchitis, sinusitis
Balgham Kham	Raw, incompletely matured	Indigestion, poor metabolism
Balgham Ma'i	Thin, watery	Edema, allergic disorders
Balgham Jissee	Dense, heavy, gypsoid	Arthritis, joint stiffness
Balgham Maleeh	Salty	Chronic irritation of mucosa
Balgham Hamid	Acidic	Hyperacidity, gastric irritation
Balgham Aafis	Acrid	Chronic inflammatory disorders
Balgham Zujaji	Glassy, highly viscous	Bronchial asthma, COPD

The classification described by classical physicians reflects a sophisticated understanding of pathological alterations in body secretions. Variations in consistency, viscosity, and biological behavior closely resemble present-day descriptions of inflammatory exudates, mucus hypersecretion, and chronic metabolic abnormalities.

Etiological factors associated with *Ghair Tabayi Balgham*

Clinical observations identified multiple lifestyle and physiological factors responsible for the formation of abnormal phlegm.

Major etiological factors observed

Etiological Factor	Clinical Observation
Weak digestion (Su-e-Hazm)	Very common
Reduced Hararat-e-Ghariziyyah	Common
Sedentary lifestyle	Frequently observed
Excess consumption of cold foods	Frequently observed
Obesity	Common
Physical inactivity	Common
Psychological stress	Moderate
Advancing age	Moderate

Weak digestive capacity was consistently observed among patients presenting with Balghami disorders. Most participants reported chronic indigestion, abdominal heaviness after meals, bloating, reduced appetite, and delayed gastric emptying. These findings support the classical Unani concept that impaired digestion leads to incomplete maturation of humors, resulting in the formation of pathological Balgham.

Lifestyle assessment further revealed that prolonged physical inactivity, excessive intake of refrigerated foods, dairy products, refined carbohydrates, and inadequate exercise were common among affected individuals.

Clinical manifestations

The clinical evaluation revealed that patients with Ghair *Tabayi Balgham* (abnormal phlegm) exhibited multisystem involvement, indicating that the pathological effects of abnormal phlegm were not confined to the respiratory system but affected several organ systems simultaneously. The spectrum of clinical manifestations observed in the present study closely corresponded with the descriptions documented in classical Unani literature.

Digestive manifestations

Digestive symptoms were among the most frequently encountered clinical features. Patients commonly presented with poor appetite, sluggish digestion, abdominal heaviness, flatulence, nausea, constipation, and postprandial lethargy. These manifestations are indicative of impaired digestive efficiency and diminished *Quwwat-e-Hazima* (digestive power), which, according to Unani principles, leads to incomplete digestion and the formation of *Ghair Tabayi Balgham*. The findings support the classical view that defective digestion is a primary etiological factor in the development of humoral imbalance and subsequent systemic disease.

Respiratory manifestations

Respiratory involvement was observed in a substantial proportion of patients and was characterized by chronic productive cough, excessive sputum production, breathlessness, chest congestion, allergic rhinitis, wheezing, and recurrent respiratory tract infections. Patients diagnosed with bronchial asthma and chronic bronchitis frequently exhibited persistent mucus hypersecretion and varying degrees of airway obstruction. These clinical findings closely resemble the classical Unani descriptions of *Balgham Mukhati* (Mucoid Phlegm) and *Balgham Zujaji* (Glassy Phlegm), which are characterized by thick, tenacious secretions that obstruct the respiratory passages and impair normal pulmonary function.

Musculoskeletal manifestations

Musculoskeletal complaints were also commonly reported during clinical assessment. The predominant symptoms included joint pain, morning stiffness, generalized heaviness, restricted joint movements, and muscle fatigue. According to classical Unani theory, these manifestations result from the accumulation of dense and viscous abnormal phlegm within the joints, muscles, and connective tissues, leading to obstruction, inflammation, and impaired mobility. The observed findings support this traditional concept and suggest a possible relationship between Balghami predominance and chronic musculoskeletal disorders.

Endocrine and metabolic manifestations

The study demonstrated a significant association between *Ghair Tabayi Balgham* and various endocrine and metabolic abnormalities. Frequently observed manifestations included obesity, progressive weight gain, cold intolerance, hypothyroidism, reduced physical activity, and sluggish metabolism. Obese patients commonly reported excessive daytime sleepiness, diminished exercise tolerance, impaired digestion, and gradual increase in body weight. These findings are consistent with the classical Unani concept that diminished *Hararat-e-Ghariziyyah* (innate heat) leads to metabolic slowing, accumulation of cold and moist humors, and the development of Balghami disorders.

Neurological manifestations

Neurological symptoms constituted another important clinical feature among the study participants. Commonly observed manifestations included lethargy, chronic fatigue, reduced concentration, mental sluggishness, excessive sleep, and generalized weakness. These symptoms closely parallel the classical description of Balghami predominance affecting cerebral and nervous system functions, wherein excessive coldness and moisture are believed to impair mental alertness, cognitive performance, and overall neurological vitality. Collectively, these observations highlight the systemic nature of *Ghair Tabayi Balgham* and reinforce the holistic approach of Unani medicine in understanding the pathogenesis of chronic diseases.

Distribution of associated disorders

Descriptive analysis of chronic OPD patients demonstrated a strong association between Balghami features and several chronic diseases.

Table 3: Distribution of major associated disorders

Associated Disorder	Approximate Frequency
Obesity	28%
Hypothyroidism	18%
Chronic bronchitis/ Bronchial asthma	16%
Arthritis	15%
Metabolic syndrome	10%
Diabetes mellitus	8%
Chronic fatigue syndrome	8%

Approximately 60% of patients attending the chronic disease clinic exhibited one or more characteristic features of Balghami predominance, indicating that abnormal phlegm may represent an important underlying pathological mechanism in lifestyle-related disorders.

Comparative correlation with contemporary biomedical disorders

Comparative evaluation revealed remarkable similarities between classical Unani concepts and modern biomedical understanding.

Table 4: Correlation between *Ghair Tabayi Balgham* and modern diseases

Unani Concept	**Modern Biomedical Correlation**
Reduced Hararat-e-Ghariziyyah	Reduced basal metabolic rate
Su-e-Hazm	Digestive dysfunction
Excess Balgham	Mucus hypersecretion
Sudda	Airway obstruction/Vascular obstruction
Barid wa Ratab predominance	Metabolic slowing
Balghami Mizaj	Obesity and hypothyroidism
Mawad-e-Fasida	Chronic inflammatory mediators

The comparison demonstrated that many classical Unani concepts correspond conceptually to recognized biomedical mechanisms such as chronic inflammation, oxidative stress, endocrine dysfunction, impaired metabolism, and excessive mucus production.

Therapeutic observations

Patients managed according to the fundamental principles of Unani medicine demonstrated encouraging clinical improvement following an integrated treatment approach comprising Ilaj bil Tadbeer (Regimental Therapy), Ilaj bil Ghiza (Dietotherapy), and Ilaj bil Dawa (Pharmacotherapy). Although the degree of therapeutic response varied depending on the severity, duration, and associated comorbidities of individual patients, the majority exhibited noticeable symptomatic relief and improvement in overall health status during the follow-up period.

Improvement following *Ilaj bil Tadbeer*

Patients who underwent *Ilaj bil Tadbeer* showed significant improvement in several clinical parameters. Those regularly performing *Riyazat* (exercise) reported enhanced physical endurance, reduction in generalized body heaviness, improved joint mobility, and increased energy levels, indicating better metabolic function and physical fitness. *Hammam* (steam bath) was found to be beneficial in relieving respiratory congestion, promoting muscle relaxation, and reducing joint stiffness, thereby improving respiratory comfort and musculoskeletal function. Similarly, patients receiving *Hijamah* (cupping therapy) frequently experienced relief from musculoskeletal pain, decreased joint stiffness, improved circulation, and an overall sense of well-being. These observations suggest that regimental therapies contribute to the restoration of humoral balance by enhancing circulation, promoting elimination of morbid humors, and improving the body's natural healing mechanisms.

Improvement following *Ilaj bil Ghiza*

Dietary modification constituted an essential component of the therapeutic regimen and yielded favorable clinical outcomes. Patients who adhered to the recommended dietary guidelines, particularly by avoiding cold and moist foods, refrigerated beverages, excessive dairy products, heavy oily meals, and refined sweets, demonstrated marked improvement in their symptoms. Clinical benefits included improved appetite, enhanced digestive function, reduction in abdominal bloating, decreased mucus production, alleviation of lethargy, and normalization of bowel habits. Moreover, patients who consistently followed the prescribed dietary recommendations exhibited greater overall clinical improvement than those with poor dietary compliance, underscoring the pivotal role of *Ilaj bil Ghiza* in the management of *Ghair Tabayi Balgham* and related disorders.

Improvement following *Ilaj bil Dawa*

Administration of selected Unani medicinal formulations also resulted in considerable symptomatic improvement. Frequently prescribed herbs, including Zanjabeel (*Zingiber officinale*), Filfil Siyah (*Piper nigrum*), Asgand (Withania somnifera), and Ustukhuddus (*Lavandula stoechas*), were associated with enhanced digestive efficiency, improved appetite, reduction in excessive sputum production, better respiratory function,

increased physical activity, improved sleep quality, and decreased fatigue. These medicinal plants, traditionally recognized for their *Muhallil* (anti-inflammatory), Munzij (concoctive), *Mulattif* (demulcent), *Muqawwi-e-Meda* (stomachic), and *Muqawwi-e-Aasab* (nervine tonic) properties, appeared to facilitate restoration of humoral equilibrium and improvement in overall physiological function. Although the therapeutic response varied according to the severity and chronicity of the disease, most patients experienced appreciable symptomatic improvement during the follow-up period, supporting the clinical utility of integrated Unani management in patients with *Ghair Tabayi Balgham*.

Overall findings

The present study demonstrates that Ghair *Tabayi Balgham* is a clinically relevant pathological entity with multisystem manifestations. Impaired digestion, reduced innate heat, sedentary behavior, and unhealthy dietary practices emerged as the principal etiological factors responsible for abnormal phlegm formation. Clinical observations established significant associations between *Balghami* disorders and obesity, hypothyroidism, chronic respiratory diseases, arthritis, metabolic syndrome, and chronic fatigue. Furthermore, Unani therapeutic interventions-including *Ilaj bil Ghiza, Ilaj bil Tadbeer*, and *Ilaj bil Dawa*-were associated with improvements in digestive function, metabolic activity, respiratory health, and overall quality of life. These findings support the clinical validity of the classical Unani concept of abnormal phlegm and provide a strong foundation for its integration with contemporary biomedical understanding.

Discussion

The present study comprehensively evaluated the Unani concept of *Ghair Tabayi Balgham* by integrating evidence from classical Unani literature, hospital-based clinical observations, and contemporary biomedical knowledge. The findings indicate that *Ghair Tabayi Balgham* represents a clinically significant pathological condition characterized by qualitative and quantitative disturbances in *Balgham*, which closely parallels several chronic metabolic, endocrine, inflammatory, respiratory, and musculoskeletal disorders recognized in modern medicine. The observed associations strengthen the scientific relevance of the classical Unani humoral theory and provide an important foundation for evidence-based integrative medicine[36,37,38,39].

According to classical Unani philosophy, maintenance of health depends upon the equilibrium of the four humors, namely *Dam, Balgham, Safra,* and *Sauda*. Among these, Balgham performs essential physiological functions including tissue nourishment, lubrication of joints, preservation of moisture, and maintenance of the structural integrity of delicate organs[36,37,38]. Classical scholars such as Ibn Sina, Al-Razi, Al-Majusi, and Rabban al-Tabari consistently emphasized that normal Balgham is beneficial; however, defective digestion (*Su-e-Hazm*), diminished digestive power (*Quwwat-e-Hazima*), and reduced innate heat (*Hararat-e-Ghariziyyah*) transform physiological Balgham into a pathological humor capable of producing disease[36,39]. The present investigation supports these classical observations by demonstrating that patients exhibiting Balghami characteristics commonly presented with obesity, sluggish metabolism, hypothyroidism, respiratory diseases, arthritis, and generalized fatigue. These findings suggest that the traditional concept of abnormal phlegm reflects systemic metabolic dysfunction rather than merely excessive respiratory secretions[40,41].

One of the major observations of the present study was the confirmation of the classical classification of eight varieties of abnormal phlegm. Classical Unani physicians differentiated *Ghair Tabayi Balgham into Balgham Mukhati, Balgham Kham, Balgham Ma'i, Balgham Jissee, Balgham Maleeh, Balgham Hamid, Balgham Aafis*, and *Balgham Zujaji*, each possessing characteristic physical properties and clinical manifestations.[36] These detailed classifications demonstrate remarkable clinical observation despite the absence of modern laboratory investigations. Thick mucoid forms resemble chronic mucus hypersecretion seen in bronchial asthma and chronic bronchitis, watery phlegm resembles serous inflammatory exudates and edema, while dense gypsoid forms resemble chronic degenerative joint disorders characterized by stiffness and restricted mobility. Although the explanatory models differ, the pathological observations show noteworthy conceptual similarities[41,42].

The etiological findings of the present study also support the principles described in classical Unani literature. Weak digestion, reduced innate heat, sedentary lifestyle, excessive intake of cold and moist foods, obesity, psychological stress, and advancing age were identified as the predominant factors contributing to the formation of abnormal phlegm. These observations correspond closely with current biomedical understanding of chronic non-communicable diseases, where poor dietary habits, physical inactivity, obesity, and metabolic dysregulation are recognized as major determinants of disease development[40,42]. Modern epidemiological studies have consistently demonstrated that unhealthy dietary patterns rich in refined carbohydrates, saturated fats, and ultra-processed foods, together with sedentary behavior, contribute significantly to insulin resistance, obesity, systemic inflammation, and metabolic syndrome[40,41]. Consequently, the classical Unani emphasis on dietary moderation and physical activity appears remarkably consistent with current preventive medicine[42].

The present investigation demonstrated multisystem involvement among patients with *Balghami* predominance. Digestive manifestations included poor appetite, indigestion, abdominal heaviness, flatulence, constipation, and postprandial lethargy. Respiratory manifestations consisted of chronic cough, excessive sputum production, breathlessness, allergic rhinitis, and recurrent respiratory tract infections. Musculoskeletal symptoms included joint stiffness, generalized heaviness, chronic pain, and reduced mobility, while endocrine manifestations comprised obesity, hypothyroidism, weight gain, and reduced metabolic

activity. Neurological symptoms such as lethargy, chronic fatigue, impaired concentration, and excessive sleep were also frequently encountered. These findings reinforce the holistic nature of Unani pathology, where humoral imbalance affects multiple organ systems simultaneously rather than producing isolated organ-specific disease[36,42].

A particularly important finding of the study was the strong association between *Ghair Tabayi Balgham* and obesity. Approximately one-quarter of patients exhibiting *Balghami* features were obese, and many demonstrated reduced physical activity, excessive daytime sleepiness, poor digestion, and progressive weight gain. These observations closely correspond to the Unani concept that diminished *Hararat-e-Ghariziyyah* leads to impaired metabolism, accumulation of cold and moist humors, and increased adiposity. Contemporary biomedical research likewise recognizes obesity as a chronic inflammatory disorder characterized by adipocyte hypertrophy, dysregulated adipokine secretion, insulin resistance, mitochondrial dysfunction, and oxidative stress[40,41]. Persistent low-grade inflammation associated with obesity contributes to cardiovascular disease, diabetes mellitus, non-alcoholic fatty liver disease, and several endocrine abnormalities. These parallels suggest that the classical concept of *Balghami* predominance may provide a traditional framework for understanding systemic metabolic dysfunction[41,42].

Hypothyroidism emerged as another important disorder associated with abnormal phlegm. Patients frequently presented with cold intolerance, lethargy, constipation, weight gain, dry skin, reduced mental alertness, and generalized weakness. Similar clinical features have long been described in Unani medicine as manifestations of excessive coldness and moisture resulting from diminished innate heat[36]. Modern endocrinology explains these manifestations through reduced thyroid hormone production leading to decreased basal metabolic rate, impaired lipid metabolism, reduced thermogenesis, and altered carbohydrate metabolism[43]. Although the underlying explanatory mechanisms differ, the close correspondence in clinical presentation highlights an interesting convergence between traditional humoral theory and contemporary endocrine science[43].

Respiratory manifestations observed during the present study further strengthen the relationship between classical Unani concepts and modern biomedical understanding. Patients with chronic bronchitis and bronchial asthma consistently demonstrated excessive mucus production, chronic productive cough, airway obstruction, wheezing, and breathlessness. Classical Unani scholars described *Balgham Mukhati* and *Balgham Zujaji* as thick, adhesive forms of abnormal phlegm capable of obstructing the respiratory passages and impairing normal breathing[36]. Current respiratory medicine recognizes mucus hypersecretion, goblet cell hyperplasia, altered mucin expression, epithelial inflammation, impaired mucociliary clearance, and persistent airway remodeling as central mechanisms in asthma, chronic bronchitis, and chronic obstructive pulmonary disease (COPD) [44,46]. The striking similarity between these descriptions supports the enduring clinical relevance of Unani observations[44,46].

Musculoskeletal disorders, particularly arthritis and chronic joint stiffness, were also frequently encountered in the present study. Classical Unani physicians attributed such disorders to the deposition of dense and viscous abnormal phlegm within joints and connective tissues. In particular, *Balgham Jissee* was considered responsible for pain, heaviness, restricted movement, and chronic inflammation[36]. Modern rheumatology explains osteoarthritis and inflammatory arthropathies through cartilage degeneration, synovial inflammation, oxidative stress, cytokine-mediated tissue destruction, and immune dysregulation. Although molecular mechanisms differ from humoral explanations, both systems acknowledge that chronic inflammatory accumulation contributes significantly to joint pathology[47].

The neurological manifestations observed in this study, including chronic fatigue, reduced concentration, mental sluggishness, excessive sleep, and generalized weakness, further demonstrate the multisystem nature of *Balghami* disorders. Contemporary research increasingly recognizes that chronic systemic inflammation, endocrine dysfunction, oxidative stress, mitochondrial impairment, and altered neurotransmitter activity contribute to fatigue syndromes and cognitive dysfunction[48]. These observations may represent modern biological correlates of the classical Unani concept that abnormal phlegm adversely affects cerebral function through diminished innate heat and impaired nutrition[48].

One of the strengths of the present investigation was the evaluation of classical Unani therapeutic principles in routine clinical practice. Patients managed with *Ilaj bil Tadbeer, Ilaj bil Ghiza*, and *Ilaj bil Dawa* demonstrated encouraging clinical improvement. Regimental therapies such as *Riyazat* (exercise), *Hammam* (steam bath), and *Hijamah* (cupping therapy) were associated with improved circulation, enhanced physical activity, reduced joint stiffness, and better respiratory function. Regular exercise is now universally recommended for the prevention and management of obesity, diabetes, cardiovascular disease, and metabolic syndrome because of its beneficial effects on insulin sensitivity, inflammatory markers, endothelial function, and mitochondrial activity[49]. Thus, the classical Unani recommendation of *Riyazat* is strongly supported by current biomedical evidence[49].

Dietary modification (Ilaj bil Ghiza) constituted another important component of management. Restriction of cold and moist foods together with encouragement of warm, freshly prepared, easily digestible meals resulted in improvements in appetite, digestion, bowel habits, and reduction of phlegmatic symptoms. Modern nutritional science likewise recognizes that dietary composition influences gut microbiota, inflammatory responses, glucose metabolism, and immune regulation. Mediterranean-style diets rich in vegetables, fruits,

whole grains, and healthy fats have been associated with reduced inflammatory biomarkers and improved metabolic health.[50] Consequently, although dietary terminology differs between the two systems, both emphasize nutrition as a cornerstone of disease prevention[50].

Pharmacotherapy (Ilaj bil Dawa) also demonstrated favorable clinical responses. Herbs such as *Zingiber officinale* (Zanjabeel), *Piper nigrum* (Filfil Siyah), Withania somnifera (Asgand), *and Lavandula stoechas* (Ustukhuddus) have traditionally been prescribed to improve digestion, enhance metabolism, reduce excessive phlegm, and strengthen vital organs. Contemporary pharmacological studies have reported anti-inflammatory, antioxidant, immunomodulatory, bronchodilatory, adaptogenic, and gastroprotective activities for these medicinal plants, providing scientific support for several of their traditional uses[49,50]. Nevertheless, large-scale randomized clinical trials remain necessary to establish standardized dosage regimens, efficacy, and long-term safety[49,50].

The findings of the present study therefore suggest that the classical Unani concept of *Ghair Tabayi Balgham* extends far beyond the conventional understanding of phlegm as merely a respiratory secretion. Instead, it appears to represent a comprehensive systemic disorder involving metabolic impairment, chronic inflammation, endocrine dysfunction, immune dysregulation, oxidative stress, and altered tissue nutrition. Such an interpretation offers a valuable conceptual bridge between traditional Unani medicine and contemporary biomedical science, supporting the integration of humoral pathology into modern evidence-based healthcare research[48,50].

Despite these encouraging observations, certain limitations should be acknowledged. The present investigation was conducted at a single tertiary care center with a relatively limited sample size and predominantly descriptive methodology. Objective biochemical markers of inflammation, oxidative stress, endocrine function, and immune activation were not evaluated in all participants. Furthermore, causal relationships between abnormal phlegm and individual disease entities could not be established because of the observational nature of the study. Future multicenter studies incorporating molecular biomarkers, metabolomics, microbiome analysis, advanced imaging, and randomized controlled clinical trials are required to further validate the scientific basis of *Ghair Tabayi Balgham* and its relevance in chronic non-communicable diseases[47,50].

Overall, the present study demonstrates substantial conceptual agreement between classical Unani descriptions of abnormal phlegm and contemporary biomedical understanding of chronic metabolic, inflammatory, respiratory, endocrine, and musculoskeletal disorders. These findings reinforce the scientific relevance of the Unani humoral theory and suggest that the traditional concept of *Ghair Tabayi Balgham* may provide a holistic framework for understanding complex chronic diseases. Integration of classical Unani wisdom with modern biomedical research has the potential to strengthen evidence-based traditional medicine, promote integrative healthcare, and encourage the development of novel preventive and therapeutic strategies for lifestyle-related disorders[36,50].

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Conclusion

The present study comprehensively evaluated the Unani concept of *Ghair Tabayi Balgham* (abnormal phlegm) through critical analysis of classical Unani literature, hospital-based clinical observations, and comparative interpretation with contemporary biomedical evidence. The findings demonstrate that abnormal phlegm is a clinically significant pathological entity resulting from qualitative and quantitative alterations in normal

Balgham due to impaired digestion (*Su-e-Hazm*), diminished innate heat (*Hararat-e-Ghariziyyah*), unhealthy dietary practices, sedentary lifestyle, and impaired metabolic function. These observations corroborate the classical descriptions of eminent Unani physicians, including Ibn Sina, Al-Razi, Al-Majusi, Rabban Al-Tabari, and Ibn Al-Nafis, who regarded abnormal phlegm as a major etiological factor in chronic disease.

Funding and conflict of interest: Nil

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