

# Unani Concepts of Brain Pathology: Humoral Mechanisms in Māddī Neurological Disorders

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## Abstract

**Background:** The Unani System of Medicine (USM) considers the brain (Dimāgh) as the principal organ of Quwā Nafsāniyya (psychic faculties), responsible for sensation, cognition, memory, movement, and emotional regulation. According to Unani principles, health is maintained through equilibrium of Mizāj (temperament) and Akhlāṭ (humours), whereas disease develops when this balance is disturbed. Among neurological disorders, Sū'-i-Mizāj Māddī Dimāgh refers to pathological conditions of the brain associated with the accumulation of morbid matter (Māddā) or vapours (Bukhārāt). Classical Unani physicians extensively described the etiopathogenesis of these disorders in relation to humoral imbalance, obstruction of neural pathways, and disturbance in the circulation of Rūḥ Nafsānī. **Objective:** To critically review and elaborate the pathogenesis, anatomical basis, humoral mechanisms, and clinical manifestations of Māddī disorders of the brain in Unani medicine. **Materials and Methods:** This narrative review was conducted using classical Unani literature including Al-Qanun fi'l-Tibb, Kamil al-Sana'a, Zakhira Khwarizam Shahi, Kitab al-Hawi, Firdaus al-Hikmat, and Moalajat Buqratiyah. Relevant modern scientific literature concerning neurological disorders, neuroinflammation, cerebrovascular disease, and psychosomatic disorders was also consulted. The collected material was critically analyzed, translated where necessary, and thematically organized. **Results:** The review demonstrates that Māddī disorders of the brain arise due to qualitative and quantitative derangement of humours, leading to accumulation of cold, hot, viscous, or vaporous morbid matter within the ventricles, meninges, nerves, and cerebral tissues. These morbid substances impair the flow of Rūḥ Nafsānī and disturb psychic functions. Classical descriptions of Šar'a (epilepsy), Sakta (apoplexy), Falij (paralysis), Mālankhūliyā (melancholia), Duwār (vertigo), and Shaqīqa (migraine) show notable conceptual similarities with modern neurological and psychiatric conditions. **Conclusion:** The Unani concept of Sū'-i-Mizāj Māddī provides a holistic explanation for neurological

and psychiatric disorders based on temperament, humoral imbalance, and obstruction of vital functions. Understanding these concepts remains important for diagnosis, preventive strategies, and rational therapeutics in USM and may contribute toward integrative neurological research.

**Keywords:** Unani medicine, māddī disorders, brain diseases, mizāj, akhlāṭ, humoral pathology, neurology, quwā nafsāniyya

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## INTRODUCTION

The Unani System of Medicine (USM) is a comprehensive traditional medical system based upon the principles of humoral theory, temperament, and the preservation of harmony within the human body. The foundations of USM

were laid by Hippocrates and Galen and later enriched by eminent Arab and Persian physicians such as Ibn Sina (Avicenna), Zakariya Razi, Ali Ibn Abbas Majoosi, and Ismail Jurjani. In Unani philosophy, health is maintained by the balanced interaction of Arkān (elements), Mizāj (temperament), Akhlāt (humours), A‘dā (organs), Arwāḥ (vital spirits), Quwā (faculties), and Af‘āl (functions). Any disturbance in these governing principles results in disease [1].

Among these principles, Mizāj occupies a central position because it determines the structural and functional integrity of organs. The term Mizāj literally means “intermixture” and refers to the resultant quality produced after interaction among the four elemental qualities: heat (Ḥarārat), coldness (Burūdat), moisture (Ruṭūbat), and dryness (Yubūsat) [2]. Every organ possesses a unique temperament necessary for normal functioning. The brain (Dimāgh) is considered cold and moist (Bārid Raṭb) in temperament, which enables sensitivity, cognition, memory, and psychic activities [2, 3].

Any deviation from the normal temperament is termed Sū’-i-Mizāj. This may occur either without material involvement (Sū’-i-Mizāj Sāda) or with the accumulation of morbid matter (Sū’-i-Mizāj Māddī) [4, 5]. Disorders of the brain associated with morbid humours are collectively categorized under Sū’-i-Mizāj Māddī Dimāgh. These diseases arise when abnormal humours, toxic vapours, or viscous substances accumulate within the cerebral tissues, ventricles, meninges, or neural pathways, thereby interfering with the flow of Rūḥ Nafsānī and disturbing psychic functions [3, 6, 7].

Neurological and psychiatric disorders have been described extensively in classical Unani texts under conditions such as Shar‘a (epilepsy), Sakta (apoplexy), Faliḡ (paralysis), Mālankhūliyā (melancholia), Duwār (vertigo), Shaqīqa (migraine), and Junūn (insanity). The pathogenesis of these disorders was interpreted in relation to humoral imbalance, obstruction (Sudda), derangement of temperament, and impairment of cerebral faculties [4, 6–8].

Modern neurological science recognizes the importance of vascular obstruction, neuroinflammation, metabolic toxins, neurotransmitter imbalance, and neurodegenerative changes in the causation of neurological disorders. Interestingly, several classical Unani concepts conceptually parallel these mechanisms. The Unani notion of morbid matter causing obstruction and functional impairment resembles modern ideas of ischemia, edema, neurotoxicity, and inflammatory pathology [8, 9].

This review aims to comprehensively discuss the pathogenesis of Māddī disorders of the brain according to classical Unani medicine while correlating these concepts with contemporary scientific understanding.

## CONCEPT OF MIZAJ (TEMPERAMENT)

Mizāj is one of the seven essential principles (Umūr Tabī‘iyya) of Unani medicine. According to Ibn Sina, Mizāj results from the interaction and equilibrium of opposite qualities present in the four Arkān: fire (Nār), air (Hawā’), water (Mā’), and earth (Arḍ) [2, 4]. Each element possesses two primary qualities (Table 1).

**Table 1.** Four elements and their characteristics.

| Element (Rukn) | Primary qualities | Functional characteristics       |
|----------------|-------------------|----------------------------------|
| Fire (Nār)     | Hot and Dry       | Maturation, metabolic activity.  |
| Air (Hawā’)    | Hot and Moist     | Lightness, mobility, vitality.   |
| Water (Mā’)    | Cold and Moist    | Fluidity, softness, nourishment. |
| Earth (Arḍ)    | Cold and Dry      | Stability, firmness, structure.  |

The interaction of these qualities produces the temperament of organs and individuals. The brain possesses a cold and moist temperament, which facilitates sensitivity, perception, memory, and psychic functions [2, 3, 10].

Classical Unani scholars classified Sū'-i-Mizāj into two major categories: Sū'-i-Mizāj Sāda and Sū'-i-Mizāj Māddī (Table 2) [3, 11, 12].

**Table 2.** Type of Sū'-i-Mizāj.

| Type of Sū'-i-Mizāj | Description                                              |
|---------------------|----------------------------------------------------------|
| Sū'-i-Mizāj Sāda    | Temperamental derangement without morbid matter.         |
| Sū'-i-Mizāj Māddī   | Temperamental derangement associated with morbid matter. |

In Sū'-i-Mizāj Māddī, abnormal humours accumulate within organs and disturb their physiological functions. In the brain, this accumulation impairs the circulation of Rūḥ Nafsānī and disrupts psychic faculties [6, 13, 14].

### FORMATION OF AKHLĀṬ (HUMOURS)

According to USM, Akhlāṭ are formed after digestion and transformation of food through four stages of digestion:

- Haḍm-i-Ma'idī (gastric digestion).
- Haḍm-i-Kabidī (hepatic digestion).
- Haḍm-i-'Urūqī (vascular digestion).
- Haḍm-i-A'ḍā'ī (tissue digestion).

The liver plays a central role in producing healthy humours. Balanced diet, proper lifestyle, and normal hepatic temperament generate Akhlāṭ Ṭabī'iyya (normal humours), whereas dietary indiscretion, environmental factors, emotional stress, sedentary lifestyle, and impaired digestion lead to Akhlāṭ Ghayr Ṭabī'iyya (abnormal humours) (Table 3) [15–17].

**Table 3.** The four primary humours are.

| Humour               | Temperament    | Physiological role                      |
|----------------------|----------------|-----------------------------------------|
| Dam (Blood)          | Hot and Moist  | Nourishment and vitality.               |
| Balgham (Phlegm)     | Cold and Moist | Lubrication and nutrition.              |
| Ṣafra' (Yellow bile) | Hot and Dry    | Metabolic stimulation.                  |
| Sawdā' (Black bile)  | Cold and Dry   | Structural stability and concentration. |

Disturbance in quantity or quality of these humours forms the basis of disease pathogenesis [18–22].

### PATHOGENESIS OF HUMORAL DISORDERS

The pathological changes in Akhlāṭ may be quantitative or qualitative. Quantitative abnormalities involve increase or decrease in humours, whereas qualitative abnormalities involve altered temperament, viscosity, toxicity, or putrefaction [3, 6, 7].

#### Amrād-e-Balghamiyya (Phlegmatic Disorders)

Balgham is naturally cold and moist. Excessive coldness, over-sleeping, sedentary lifestyle, weak digestion, and excessive intake of cold and moist foods increase phlegmatic humour [3–6]. Abnormal phlegm becomes thick, viscous, and obstructive, leading to blockage of vessels and neural pathways (Table 4) [6, 7, 23].

**Table 4.** Pathological effects of abnormal balgham.

| Pathological change | Clinical effect                |
|---------------------|--------------------------------|
| Increased viscosity | Obstruction of pathways.       |
| Excess coldness     | Depression of neural activity. |
| Excess moisture     | Heaviness, lethargy.           |
| Putrefaction        | Infection and foul secretions. |

In neurological disorders, excessive Balgham obstructs the flow of Rūḥ Nafsānī, resulting in conditions such as paralysis, epilepsy, vertigo, somnolence, and apoplexy [6, 7, 23].

#### **Amrāḍ-e-Şafrāwiyya (Bilious Disorders)**

Şafrā' is hot and dry in temperament. Excessive spicy foods, emotional stress, hepatic dysfunction, fever, and dehydration increase bilious humour. Abnormal Şafrā' produces heat, irritation, inflammation, and dryness.

In the brain, bilious vapours ascend toward cerebral tissues and produce acute headaches, insomnia, delirium, irritability, photophobia, and convulsions [7, 8, 24, 25].

#### **Amrāḍ-e-Sawdāwiyya (Melancholic Disorders)**

Sawdā' is cold and dry and is regarded as the most harmful humour when deranged. Excessive intake of dried meat, lentils, cabbage, salted fish, chronic stress, insomnia, and digestive disorders increase abnormal Sawdā'.

Abnormal Sawdā' produces thick vapours (Bukhārāt), chronic obstruction, fear, depression, anxiety, hallucinations, and psychotic manifestations [7, 8, 24, 25].

#### **Amrāḍ-e-Damwiyya (Sanguine Disorders)**

Dam is considered the most vital humour. Excess blood volume, vascular congestion, inflammation, and altered blood viscosity may impair cerebral circulation and predispose to cerebrovascular disorders such as stroke, hemorrhage, and headache.

### **UNANI ANATOMY AND PHYSIOLOGY OF THE BRAIN**

The brain (Dimāgh) is regarded as the principal organ of Quwā Nafsāniyya (psychic faculties) in Unani medicine. Classical Unani scholars described the brain as the center of sensation, voluntary movement, imagination, memory, cognition, and emotional regulation. It is considered the most important organ responsible for the generation and distribution of psychic functions throughout the body [5, 6, 26].

The anatomical components of the brain include Jauhar-i-Dimāgh (brain substance), A'şāb (nerves), Aghshiya (meninges), and Tajāwīf/Buṭūn (ventricles). The meninges are further divided into Umm-i-Ghalīz, which corresponds to the dura mater, and Umm-i-Raqīq, which corresponds to the pia mater. These coverings provide protection and support to the delicate structures of the brain.

The ventricles (Buṭūn-i-Dimāgh) are considered channels for the circulation of Rūḥ Nafsānī (psychic spirit). According to classical Unani concepts, the proper movement of Rūḥ Nafsānī within these cavities is essential for normal neurological and mental functions. Obstruction of these cavities by morbid matter may interfere with the circulation of the psychic spirit and can result in loss of consciousness, epilepsy, paralysis, or various mental disorders.

Different parts of the brain are considered the seats of different psychic faculties according to Unani medicine. The anterior part of the brain is the seat of Quwwat Khayāl (imagination), the middle part is the seat of Quwwat Fikr (cognition and thought), whereas the posterior part is the seat of Quwwat Ḥifẓ (memory). Any disturbance affecting these regions due to the accumulation of morbid matter may lead to corresponding neurological or psychiatric manifestations depending upon the faculty involved [5, 6, 26].

### **PATHOGENESIS OF MĀDDĪ DISORDERS OF THE BRAIN**

Māddī disorders of the brain arise due to the accumulation of abnormal humours, pathological matter, or morbid vapours within the cerebral tissues, meninges, nerves, or ventricles. Such morbid matter may originate locally within the brain itself or may migrate from distant organs such as the stomach, liver,

spleen, uterus, or vascular system. The migration of pathological matter from these organs to the brain is considered an important mechanism in the development of various neurological and psychiatric disorders.

Classical Unani physicians emphasized that a thorough understanding of the nature of Māddā (morbid matter), its site of accumulation, and its route of ascent to the brain is essential for accurate diagnosis and effective treatment. The severity and clinical manifestations of the disease largely depend upon the quality, quantity, and location of the accumulated morbid matter [6, 13].

### TYPES OF MORBID MATTER (MAWĀD)

Different types of morbid matter are responsible for the development of Māddī disorders of the brain. Bārid Ghalīz refers to cold, thick, and viscous morbid matter that tends to obstruct channels and impair normal cerebral functions. Hārī Lazīj denotes hot, irritative, and sticky morbid matter that may produce inflammatory and excitatory manifestations. Riyāh/Bukhārāt refer to pathological vapours and gaseous morbid matter that ascend to the brain and disturb its normal functions.

These forms of morbid matter may accumulate in different anatomical regions of the brain and produce varying clinical effects. Accumulation within the Buṭūn-i-Dimāgh (ventricles) may interfere with the circulation of Rūḥ Nafsānī and lead to loss of consciousness, epilepsy, and related neurological disorders. When morbid matter accumulates in the external meningeal spaces, it commonly gives rise to headache, migraine, and other painful conditions of the head. However, accumulation of morbid matter on the internal meningeal surfaces may result in delirium, insomnia, vertigo, and disturbances of higher mental functions. Thus, the site of accumulation plays a crucial role in determining the nature and severity of the clinical manifestations [6, 13].

### ROLE OF BUKHĀRĀT (MORBID VAPOURS)

Classical Unani scholars described Bukhārāt as subtle vapours generated from abnormal digestion, putrefaction, or excessive heat. These vapours ascend toward the brain and disturb mental and neurological functions. Foods producing excessive Sawdā', such as dried meat, lentils, cabbage, and salted fish, contribute to formation of thick vapours. Similarly, excessive thinking, chronic stress, sleep deprivation, sedentary lifestyle, suppression of natural evacuations, and cessation of habitual Fasd (venesection) or Hījāmah may predispose to accumulation of Bukhārāt (Table 5) [6, 7, 13].

**Table 5.** Factors leading to formation of bukhārāt.

| Predisposing factors               | Pathological consequences    |
|------------------------------------|------------------------------|
| Sedentary lifestyle                | Accumulation of vapours.     |
| Excessive sleep                    | Increased phlegmatic humour. |
| Chronic stress                     | Excess Sawdā'.               |
| Digestive weakness                 | Putrefaction of humours.     |
| Suppression of natural evacuations | Retention of morbid matter.  |

The vapours rise toward the brain and may produce headache, nightmares, epilepsy, melancholia, hallucinations, mania, and syncope [6, 7, 13].

### OBSTRUCTION (SUDDA) AND IMPAIRMENT OF RŪḤ NAFSĀNĪ

The concept of Sudda (obstruction) occupies a central place in the pathogenesis of neurological disorders in USM. Sudda occurs when thick humours, inflammatory matter, or vapours obstruct vessels, nerves, ventricles, or cerebral pathways [6, 7, 13].

When obstruction develops:

- Circulation of Rūḥ Nafsānī becomes impaired.
- Neural organs fail to perform sensory and motor functions.

- Psychic faculties become weakened.
- Harārat Gharīziyya declines.
- Secondary accumulation of morbid matter occurs (Table 6) [6, 7, 13].

**Table 6.** Pathophysiological sequence in māddī disorders.

| Sequence                        | Effect                          |
|---------------------------------|---------------------------------|
| Accumulation of abnormal humour | Temperamental imbalance.        |
| Formation of Sudda              | Obstruction of pathways.        |
| Impaired flow of Rūḥ Nafsānī    | Neurological dysfunction.       |
| Weakening of Harārat Gharīziyya | Loss of physiological activity. |
| Progressive degeneration        | Chronic neurological disease.   |

This concept resembles modern mechanisms of ischemia, edema, vascular obstruction, neurotoxicity, and inflammatory pathology [6, 7, 13].

## CLINICAL MANIFESTATIONS OF MĀDDĪ BRAIN DISORDERS

### Ṣar‘a (Epilepsy)

Ṣar‘a is characterized by seizures, loss of consciousness, convulsions, and frothing. According to Unani medicine, it results from obstruction of cerebral ventricles by phlegmatic or bilious matter. Common Features are sudden collapse, convulsions, frothing from mouth, altered consciousness, and Postictal confusion. Modern medicine similarly attributes epilepsy to abnormal neuronal discharges and neurochemical imbalance [8, 24, 25].

### Sakta (Apoplexy)

Sakta is a severe neurological condition characterized by sudden loss of sensation, movement, and consciousness due to obstruction of cerebral pathways. Etiological factors are cold phlegmatic matter, vascular obstruction, excessive coldness and moisture, old age and thick blood, and vascular congestion. This condition bears resemblance to modern cerebrovascular accidents or stroke [8, 24, 25].

### Faliḡ (Paralysis)

Faliḡ occurs due to obstruction of nerves by cold viscous phlegm, resulting in weakness or paralysis of limbs. Clinical Features are Loss of motor function, Weakness of one side of body, impaired speech and reduced sensation [8, 24, 25].

### Shaqīqa (Migraine)

Shaqīqa refers to unilateral headache associated with vapours, bilious irritation, or humoral congestion. Symptoms are throbbing unilateral headache, photophobia, vertigo, tinnitus and nausea [8, 24, 25].

### Mālankhūliyā (Melancholia)

Mālankhūliyā results from abnormal Sawdā’ affecting psychic faculties.

Psychological manifestations are fear and anxiety, suspicion, depression, hallucinations, and delusional thoughts. The description resembles depressive disorders, psychosis, and anxiety spectrum disorders [8, 24, 25].

### Duwār (Vertigo)

- Duwār is caused by accumulation of vapours or humours within cerebral cavities.
- Features are dizziness, imbalance, giddiness, visual disturbances and nausea [8, 24, 25].

### Junūn and Mania

Excessive hot vapours or deranged Sawdā’ may produce severe psychiatric disorders characterized by agitation, aggression, insomnia, hallucinations, and altered behavior [8, 24, 25].

## CORRELATION WITH MODERN SCIENCE

Several classical Unani concepts show conceptual similarities with contemporary neurological science (Table7).

**Table 7.** Modern scientific correlation.

| Unani concept        | Modern scientific correlation                      |
|----------------------|----------------------------------------------------|
| Sudda (obstruction)  | Vascular occlusion and ischemia.                   |
| Bukhārāt             | Neurotoxic metabolites and inflammatory mediators. |
| Excess Balgham       | Edema, metabolic depression.                       |
| Excess Ṣafrā'        | Neuroinflammation and excitotoxicity.              |
| Excess Sawdā'        | Neurodegeneration and psychiatric illness.         |
| Impaired Rūḥ Nafsānī | Neural transmission dysfunction.                   |

Modern research has established the role of inflammatory cytokines, oxidative stress, neurovascular obstruction, metabolic toxins, and neurotransmitter imbalance in neurological diseases. These concepts conceptually parallel Unani descriptions of humoral imbalance and morbid matter.

Furthermore, the Unani emphasis on diet, sleep, mental stress, and lifestyle factors aligns closely with modern preventive neurology and psychosomatic medicine [27, 28].

## MATERIALS AND METHODS

This study is a narrative review based on classical Unani literature and relevant contemporary scientific sources. Primary data were obtained from authoritative Unani texts including Al-Qanun fi'l-Tibb by Ibn Sina, Kitab al-Hawi by Zakariya Razi, Kamil al-Sana'a by Ali Ibn Abbas Majosi, Zakhira Khwarizam Shahi by Ismail Jurjani, Firdaus al-Hikmat by Rabban Tabari, and Moalajat Buqratiyah.

A systematic thematic approach was adopted to collect and analyze information related to:

- Mizāj and Sū'-i-Mizāj.
- Akhlāt and their pathological derangements.
- Anatomy and physiology of the brain.
- Quwā Nafsāniyya and psychic functions.
- Etiopathogenesis of Māddī brain disorders.
- Clinical manifestations and therapeutic implications.

Relevant modern scientific literature related to neurology, neuroinflammation, cerebrovascular diseases, psychosomatic medicine, and neuropsychiatry was also consulted to facilitate conceptual interpretation and comparative analysis.

The extracted data were critically reviewed, translated where necessary, and synthesized into thematic categories. Since this study is descriptive and interpretative in nature, no statistical analysis was performed.

## DISCUSSION

Classical Unani scholars developed an elaborate and sophisticated understanding of neurological and psychiatric diseases centuries before the emergence of modern neuroscience. Their interpretation of disease was based upon the interaction between temperament, humours, psychic faculties, and environmental factors.

The concept of Sū'-i-Mizāj Māddī explains neurological disease because of qualitative and quantitative derangement of humours leading to accumulation of morbid matter within the brain. Excessive Balgham causes coldness, heaviness, and obstruction, whereas excess Ṣafrā' produces inflammation, irritation, and hyperactivity. Similarly, abnormal Sawdā' is associated with chronic degenerative and psychiatric conditions.

The Unani notion of Sudda bears conceptual resemblance to vascular occlusion, cerebral edema, neuroinflammation, and impaired neurotransmission. Similarly, the concept of Bukhārāt parallels toxic metabolites and inflammatory mediators affecting cerebral function.

Another remarkable aspect of USM is its psychosomatic perspective. Mental stress, excessive thinking, insomnia, and emotional imbalance are considered important etiological factors in neurological disease. Modern research similarly recognizes chronic stress, sleep deprivation, neuroinflammation, and psychological trauma as contributors to psychiatric and neurological disorders.

The Unani model also emphasizes preventive healthcare through balanced diet, regulation of sleep, physical activity, evacuation of morbid matter, and maintenance of emotional equilibrium. These principles remain highly relevant in contemporary lifestyle medicine.

Although classical descriptions are largely qualitative, they provide valuable insights into integrative neurology and holistic patient care. Further interdisciplinary research may help establish scientific correlations between humoral pathology and biochemical, vascular, inflammatory, or neurophysiological mechanisms.

## CONCLUSION

Māddī disorders of the brain in Unani medicine arise due to accumulation of abnormal humours, morbid matter, or vapours that disturb cerebral temperament and obstruct the circulation of Rūḥ Nafsānī. The resulting dysfunction of psychic faculties leads to a wide spectrum of neurological and psychiatric disorders including epilepsy, apoplexy, paralysis, migraine, vertigo, melancholia, and insanity.

The Unani framework of Mizāj, Akhlāt, Sudda, and Quwā Nafsāniyya provides a holistic and systematic understanding of disease pathogenesis. Many classical concepts demonstrate conceptual similarities with modern mechanisms such as neuroinflammation, vascular obstruction, neurotoxicity, and psychosomatic dysfunction.

A comprehensive understanding of these principles remains essential for accurate diagnosis, preventive care, and rational therapeutics in USM. Further scientific and interdisciplinary studies are needed to explore the relevance of humoral pathology in modern integrative neurology.

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