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Correlation of Blood Tests and Body Chemicals with Akhlat (Humors) in Unani Medicine

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Abstract | **Original Research Article**

Unani medicine is an ancient healing system that started with Greek doctors like Hippocrates and was later developed by famous scholars like Ibn Sina (Avicenna) and Al-Razi. It is based on the idea that our body contains four main fluids called Akhlat or humors: Dam (blood), Balgham (phlegm), Safra (yellow bile), and Sauda (black bile). These humors must stay in balance to keep us healthy. If one humor becomes too much or too little, it can lead to illness. This is called Su-e-Mizaj, meaning imbalance in the body's nature. Traditionally, Unani doctors would check a person's health by feeling the pulse, looking at the tongue, urine, stool, and observing overall behavior and appearance. They used these methods to understand which humor was out of balance. Today, modern medicine uses scientific tests to check health. These include blood tests like Total Leukocyte Count (TLC) and Differential Leukocyte Count (DLC), as well as tests to measure hormones and enzymes in the body. These tests help doctors understand if there is an infection, inflammation, or problem with organs like the liver or thyroid. This article tries to connect these modern blood tests with the old Unani idea of humors. By understanding how test results may relate to the balance or imbalance of humors, we can bring together old knowledge and modern science. This can help make better diagnoses and treatments using both systems of medicine.

Keywords: Unani medicine, Akhlat (humors), blood tests, Mizaj (temperament), Differential Leukocyte Count (DLC), Su-e-Mizaj (imbalance).

INTRODUCTION

Unani medicine is an old and respected healing system that began in ancient Greece and was later developed by Arab and Persian scholars like Hippocrates, Galen, Ibn Sina (Avicenna), and Al-Razi. It is still widely used today in parts of Asia, especially in India, Pakistan, and the Middle East. The basic idea in Unani medicine is that our health depends on the balance of four main body fluids, called Akhlat (humors). These humors are: Dam (blood), Balgham (phlegm), Safra (yellow bile), and Sauda (black bile). This balance, collectively referred to as Mizaj (temperament), governs both physiological and psychological well-being. [41, 56, 57] In contrast, modern biomedical science evaluates health through laboratory investigations such as Total Leukocyte Count (TLC), Differential Leukocyte Count (DLC), hormonal assays, and enzyme level measurements. These parameters offer insight into immune function, hormonal balance, metabolic activity, and disease states.[58]

The convergence of Unani concepts with modern diagnostics offers a compelling area of exploration. This article seeks to establish a correlation between modern blood parameters and the classical understanding of Akhlat (humors), thereby bridging ancient medical wisdom with contemporary biomedical analysis. [1, 2, 47, 48]

MATERIALS AND METHODS

This article adopts a literary review and comparative methodology based on classical Unani texts and modern biomedical research to establish a relationship between the concept of Akhlat (humors) and contemporary laboratory parameters. The approach includes:

- **Unani Source Review:** Classical Unani texts such as *Canon of Medicine* by Ibn Sina, *Kitab*

al-Hawi by Al-Razi, and *Kulliyat-e-Nafisi* were analyzed to understand the role of Dam, Balgham, Safra, and Sauda in maintaining health.

- **Modern Laboratory Analysis:** Contemporary clinical resources and diagnostic manuals were reviewed to understand how tests like Total Leukocyte Count (TLC), Differential Leukocyte Count (DLC), hormone levels (e.g., TSH, insulin), and enzyme assays (e.g., ALT, AST, LDH) reflect physiological conditions.
- **Correlation Framework:** A thematic framework was used to correlate modern test results with corresponding Unani humor imbalances, e.g., high eosinophil count possibly indicating excess Sauda (black bile), or low lymphocytes relating to deranged Dam (blood).
- **Literature Sources:** Peer-reviewed journal articles from PubMed, Scopus, and classical Unani literature available through CCRUM and GTCH Patna libraries were used to substantiate findings.
- **Analysis:** Observational patterns and historical interpretations were used to conceptually map Unani diagnostics with modern pathology reports to establish a bidirectional understanding.

Concept of Akhlat in Unani Medicine

The theory of Akhlat is foundational in Unani medicine. According to this paradigm, each humor possesses unique qualities and functions:

- **Dam (Sanguine/Blood):** Hot and moist; responsible for nourishment and vitality.
- **Balgham (Phlegmatic/Phlegm):** Cold and moist; involved in lubrication and cooling functions.
- **Safra (Choleric/Yellow Bile):** Hot and dry; associated with metabolism and irritability.
- **Sauda (Melancholic/Black Bile):** Cold and dry; responsible for stability and structure. [1,2]

According to Unani teachings, these four humors need to be in the right balance to maintain good health. This overall balance is called Mizaj (temperament). Every person has a natural temperament based on the mix of these humors—some may have a hot temperament, some cold, others may be dry or moist, or a mix. When one or more of these humors become too much or too little, it leads to Su-e-Mizaj, which means disturbance in the body's natural balance and causes illness [3-5].

In traditional practice, Unani doctors examined patients by observing their physical signs and behavior. They checked the Nabz (pulse), observed urine, stool, and asked about sleep, appetite, emotions, and habits. Even without modern tools, these observations gave them a clear picture of what humor might be disturbed. [46]

Modern medicine, on the other hand, uses scientific tests to understand body functions. These include blood tests, hormone tests, and enzyme levels, which can detect infections, inflammation, hormonal problems, and organ damage. Some common tests are:

Total Leukocyte Count (TLC) and Akhlat

Total Leukocyte Count (TLC) refers to the number of white blood cells in the blood, which are central to the body's immune defense. From a Unani perspective, an elevated TLC can be associated with the dominance of Safra (yellow bile), which is naturally hot and dry—mirroring the inflammatory response seen in infections and autoimmune conditions. [6,7]

- **High TLC:** Could indicate an excess of Safra, as inflammation, fever, and irritability are associated with its dominance. The patient might present with symptoms such as restlessness, heat intolerance, and hyperactivity—all signs of a Har Ratab Mizaj (hot and dry temperament). [8,9]
- **Low TLC:** May suggest a predominance of Balgham, due to its cold and moist nature, which dampens immune reactivity. Individuals with this profile are typically sluggish, fatigued, and susceptible to cold-related disorders. [10,11]

Clinical Interpretation in Unani Framework

Elevated TLC due to infections aligns with Unani diagnoses involving Humma Safraviya (bilious fever), Warme Jigar (inflammation of the liver), or Hummiyat (fevers of hot temperament).[12] Conversely, a depressed TLC may be interpreted as Tashannuj Balghami (phlegmatic stiffness) or general immunosuppressant due to cold, moist humoral imbalance.[13]

Differential Leukocyte Count (DLC) and Akhlat

DLC evaluates the relative proportion of different white blood cell types—neutrophils, lymphocytes, monocytes, eosinophils, and basophils. Each subtype plays a distinct role and can be mapped to specific humoral dominances.

- **Neutrophilia:** Suggests Safravi dominance (yellow bile), reflecting acute bacterial infections and inflammation.
- **Lymphocytosis:** May indicate Damwi imbalance (excess blood), common in viral infections and chronic inflammatory states.
- **Eosinophilia:** Correlates with Sauda imbalance, associated with allergic conditions and parasitic infestations.
- **Monocytosis:** Points to Balghami disturbance, possibly related to sluggish immune responses and chronic infections [14,53,54,55].

Humoral Mapping of DLC

WBC Type	Dominant Humor	Temperamental Traits	Associated Disorders
Neutrophils	Safra	Hot, dry, inflammatory	Acute infections, fevers. [49]
Lymphocytes	Dam	Warm, moist, nourishing	Viral fevers, reactive states. [50,51]
Eosinophils	Sauda	Cold, dry, reactive	Allergies, parasitic diseases. [52,53]
Monocytes	Balgham	Cold, moist, phlegmatic	Chronic infections, sluggishness. [54,55]

Hormones and Their Relevance to Humoral Theory

Hormones are chemical messengers that regulate bodily functions. In Unani medicine, their actions can be seen as modern counterparts to the regulatory influence of humors on physiological processes [15].

Thyroid Hormones (T3, T4, TSH)

- Hyperthyroidism (high T3/T4, low TSH) aligns with Safravi Mizaj—hot, dry, and overactive. Symptoms such as weight loss, heat intolerance, and restlessness mirror the dominance of yellow bile. [16,17]
- Hypothyroidism (low T3/T4, high TSH) corresponds with Balghami Mizaj—cold, moist, and sluggish. Fatigue, weight gain, and cold intolerance are classic indicators. [18,19]

Cortisol (Stress Hormone)

- Elevated cortisol levels may reflect Saudawi dominance, leading to anxiety, insomnia, and depressive moods.
- Chronic stress and cortisol dysregulation resemble the Unani concept of Istirkhab (neurohumoral imbalance), often treated with Muqawwi Aasab (nervine tonics) [20-22].

Reproductive Hormones (Estrogen, Progesterone, Testosterone)

- Estrogen dominance is moist and warm, similar to Dam.
- Progesterone has cooling and stabilizing effects, reflecting Balghami traits.
- Testosterone is hot and dry, indicating a Safravi nature, linked with aggression and high energy levels [23,24].

INSULIN

Insulin, responsible for glucose metabolism, reflects Damwi (blood) activity. Insulin resistance in conditions like Type 2 diabetes can be seen as a humoral derangement involving Sauda and Balgham, where dryness and sluggishness impair nutrient assimilation. [25]

Enzymes and Humoral Correlations

Enzymes catalyze chemical reactions and maintain metabolic functions. Elevated or reduced levels can indicate specific humoral imbalances. [23,24]

Liver Enzymes (ALT, AST, ALP)

- Elevated enzymes suggest Har Mizaj (hot temperament) and Safravi dominance, indicating inflammation or liver congestion (Warme Jigar, Sudda Kabid) [26,27].
- Enzyme suppression may align with Barid Mizaj (cold temperament) or Balghami states [28].

Amylase and Lipase

- Raised levels may be interpreted as excessive Safravi activity—associated with Waram or Sudda of pancreas [29].
- Enzyme deficiency corresponds to sluggish digestion and cold temperament—common in Zof-e-Meda (weak stomach).[30]

Creatine Kinase (CK) and Lactate Dehydrogenase (LDH)

- Elevation in CK and LDH indicates tissue damage and may represent a Saudawi Mizaj, where rigidity and dryness result in chronic degeneration or fibrosis (e.g., in Daa al-Fil, Waja-ul-Mafasil) [31].

Integrative Case Examples

Case 1: Acute Fever with High TLC and Neutrophilia

- **Modern Diagnosis:** Bacterial infection.
- **Unani Perspective:** Safravi fever with Har Mizaj
- **Management:** Use of Tabasheer, Sandal, Sharbat Unnab to cool the excessive heat and purify Safra. [32-34]

Case 2: Hypothyroidism with Weight Gain and Fatigue

- **Modern Diagnosis:** Hormonal deficiency
- **Unani Perspective:** Balghami dominance
- **Management:** Warm, dry regimens using Zanjabeel, Filfil Siyah, and lifestyle adjustments to stimulate metabolism [35-37].

Case 3: Elevated LDL, CK, and LDH in a Sedentary Individual

- **Modern Diagnosis:** Hyperlipidemia and muscle breakdown
- **Unani Interpretation:** Excess Sauda and rigidity (cold, dry temperament)
- **Treatment:** Musakkin Sauda, Roghan Badam, Habb-e-Ayarij, and exercise therapy [38-40].

Diagnostic Integration: A Modern Tool for Humoral Analysis

The integration of laboratory markers with humoral theory allows Unani practitioners to enhance diagnosis and personalize treatment. By aligning TLC, DLC, hormone levels, and enzyme activity with specific temperamental disturbances, a more precise assessment of Mizaj and Su-e-Mizaj can be achieved [41,42].

Modern tools such as:

- Complete Blood Count (CBC)
- Hormonal Panels
- Liver and Kidney Function Tests
- Inflammatory Markers (CRP, ESR)

Can assist in quantifying the extent of humoral imbalances and in validating traditional observations with empirical data [43-45].

Challenges and Considerations

Despite the compelling conceptual parallels between Unani humoral theory and modern biochemical markers, several critical challenges and considerations must be addressed before establishing a robust scientific foundation for their integration:

1. **Lack of Standardization in Unani Diagnostic Methods:**

The traditional Unani system of diagnosis heavily relies on qualitative assessments such as the pulse (Nabz), the color and texture of the tongue, stool characteristics, urine examination (Baul), and an evaluation of the patient's temperament (Mizaj). These diagnostic tools are inherently subjective and demand years of experience and intuition on the part of the physician (Tabib). Unlike modern diagnostic modalities that use calibrated instruments and reproducible protocols, the absence of standardized guidelines in Unani diagnostics limits its reproducibility, inter-observer reliability, and scalability in clinical research.

2. **Insufficient Correlation Between Humoral Imbalance and Laboratory Parameters:**

There remains a significant gap in scientific literature exploring the direct relationship between the four humors (Dam, Balgham, Safrā, and Sawdā) and quantifiable biomarkers such as complete blood counts, liver enzymes, lipid profiles, or inflammatory markers. While preliminary research suggests potential links—such as increased bile acids with Safrā dominance or cold temperament correlating with slower metabolic rates—systematic and controlled studies are scarce. Rigorous clinical trials and comparative studies are essential to validate whether modern diagnostic parameters can reliably indicate the presence or dominance of specific humors.

3. **Challenges in Measuring the Holistic Nature of Unani Diagnosis:**

One of the hallmarks of Unani medicine is its integrative approach, where health is viewed as a balance between physical, emotional, environmental, dietary, and spiritual factors. This holistic lens is difficult to capture through isolated laboratory tests that focus primarily on biochemical or anatomical abnormalities. Emotional imbalances, lifestyle disruptions, seasonal variations, and psychological stress—all integral to Unani diagnostics—are not easily quantifiable and are often overlooked in conventional lab-based assessments. As a result, any attempt to correlate laboratory findings with humoral imbalance must account for this multidimensional perspective.

4. **Bridging the Epistemological Gap Between Traditional and Modern Medicine:**

Another major challenge lies in reconciling the philosophical foundations of Unani medicine, which are rooted in Greco-Arabic humoral concepts, with the reductionist and evidence-driven framework of modern biomedicine. Establishing credible scientific evidence without compromising the essence of traditional knowledge requires interdisciplinary collaboration, cultural sensitivity, and the development of hybrid models that respect both paradigms. This also involves translating ancient terminologies and pathophysiological descriptions into modern scientific language without losing their context or depth.

5. **Limited Infrastructure and Institutional Support for Integrative Research:**

In many regions, there is a lack of dedicated infrastructure, funding, and trained professionals to undertake high-quality research in traditional systems like Unani medicine. The integration of Unani diagnostics with modern biochemical markers demands not only intellectual effort but also institutional support, regulatory frameworks, and cross-disciplinary research platforms that are still underdeveloped in many countries.

CONCLUSION

The ancient framework of Akhlat offers a comprehensive understanding of human physiology and pathology, deeply rooted in the balance of natural elements and qualities. Modern diagnostics like TLC, DLC, hormonal assays, and enzyme levels serve as powerful tools to objectively evaluate this balance. By establishing a connection between these parameters and the four humors, Unani medicine can enhance its diagnostic precision and therapeutic effectiveness. This integrative approach not only enriches traditional practices but also offers a more nuanced, personalized pathway to health.

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