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## Correlation of thyroid hormones and Mizaj: A review

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**Abstract**

Endocrine disorders are prevalent around the world and thyroid disorders are one of them. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India suffer from thyroid diseases. Deficiency and abnormal hyper-secretion of thyroid hormones are termed as hypothyroidism and hyperthyroidism, respectively. Levothyroxine is a treatment of choice in *hypothyroidism* whereas *hyperthyroidism* is treated by reducing thyroid hormone synthesis, using antithyroid drugs, or by thyroidectomy. In unani medicine, thyroid gland and its hormones are not well explained in classical medical literature. Ancient Unani physician even did not mention the Mizaj of thyroid gland and its secretions, which is a fundamental concept in unani medicine, upon which diagnosis is based and it also provide basis for pharmacological treatment for a particular disease. Therefore it is necessary to establish a scientific relationship between thyroid hormones and Mizaj that would provide insight knowledge for pharmacotherapy of thyroid disorders like hypothyroidism and hyperthyroidism. In this paper, literature on *Mizaj*, *Akhlat* and Modern Literature on thyroid hormones along with scientific studies on Mizaj & thyroid hormones are reviewed and compared.

**Keywords:** Thyroid hormones, Mizaj, Unani medicine, Akhlat

**Introduction**

Thyroid gland is situated in front of trachea between cricoids cartilage and suprasternal notch. It secretes two related hormones thyroxine and tri-iodothyronine., these hormones play a very critical role in cell differentiation during development and help maintain thermogenic and metabolic homeostasis in the adult <sup>[1]</sup>. Thyroid diseases are among the commonest endocrine disorders worldwide. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India suffer from thyroid diseases <sup>[2]</sup>. Thyroid disorders includes thyroid nodules-benign and cancerous. Deficiency and abnormal hyper-secretion of thyroid hormones are termed as hypothyroidism and hyperthyroidism, respectively. Levothyroxine is a treatment of choice in *hypothyroidism* whereas *hyperthyroidism* is treated by reducing thyroid hormone synthesis, using antithyroid drugs, or reducing the amount of thyroid tissue with radioiodine (<sup>131</sup>I) treatment or by thyroidectomy <sup>[1]</sup>. Thyroid disorder's early and cost effective diagnosis and treatment is becoming a challenge not only in Unani medicine but also in modern medicine.

The exact description and detail of thyroid hormones is not found in ancient literature of Unani medicine. However, Jalinoos was the first physician who described the anatomy of thyroid gland <sup>[3]</sup>. Ancient unani Physicians treated thyroid disorders with seaweed, which contains good amount of iodine and advised heated sponge for goiter <sup>[4]</sup>. In the first century AD, Unani physician Celsus first time advised the removal of thyroid gland in goiterous hyperthyroidism. The first surgery of Goiter i.e. thyroidectomy was performed by a famous Arab surgeon Abu Al-Qasim Zahrawi. He named goiter as *Qilat-ul-Halqoomia* <sup>[5]</sup>. Zahrawi also highlighted its causes, types, symptoms and treatment.

In Unani medicine, the physiology of an organ, pathogenesis of a disease and mechanism action of a drug all depends upon Mizaj for their explanation. Every drug has its own temperament (*Mizaj-e-Advia*) due to its specific phytoconstituent. Drug used in a particular disease should have temperament opposite to the prevailing temperament of the target organ responsible for the disease. Before treating a disease Unani physician must aware of normal and imbalanced Mizaj of that diseased organ, so that physician can prescribe the drug of opposite Mizaj. Mizaj indicates the preponderance of a humor in a person or a patient.

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Diseases are usually associated with preponderance of bad humor which reflects in terms of imbalanced Mizaj (*Su-e-Mizaj*) in patients. Therefore Mizaj is a fundamental concept in unani medicine upon which diagnosis is based and it also provide basis for pharmacological treatment for a particular disease. Ancient unani physicians did not mention the hormones of thyroid gland as well as its Mizaj. Establishment of a scientific relationship between thyroid hormones and Mizaj would be a necessary step in the direction of diagnosis and treatment of thyroid disorders.

### Material & Method

This study is mainly literary review from Unani medicine texts. Also modern aspect of Applied physiology i.e. hyperthyroidism and hypothyroidism is reviewed from modern texts and by searching various medical research databases like Google scholar, research articles published in various journals and national research databases etc.

### Correlation between Thyroid hormones and Akhlat

The body has a simple and compound organ which receive their nourishment through four humors i.e. dam (blood) safra (bile), sauda (black bile), balgham (phlegm). Each humor has its own temperament. Every person attains a temperament according to the preponderance of humors in his or her body and it represent the person's healthy state. There are various quotations in Unani literature, which supports the relation between akhlat and different hormonal action in the body.

**Hippocrates:** The humoral theory (*nazriya-e-Akhlat-e- Arba*) was postulated by father of medicine Hippocrates (460 B.C.). He in his book *Tabi'at al-Insan* (human nature) has set forth his famous doctrine that:

“The body contains four humors *dam* (blood), *balgham* (phlegm), *safra* (yellow bile) and *sauda* (black bile); a right proportion, according to quality and quantity, and mixing of which (homeostasis) constitutes health and disturbed proportion and irregular distribution, according to their quantity and quality constitutes disease<sup>[6]</sup>.”

He also stated that “the functions of the body depend upon humours (Akhlat)”, which means fluids or humors are not only involved in the nutrition, but they perform many functions in the body. Hormones cannot be separated from this debate. The above statements of Hippocrates are applicable on hormones same as on humors (*Akhlat*).

**Abu Sahl Masihi:** According to *Abu Sahl Masihi*, all fluids of the body are *Akhlat*<sup>[6]</sup>. Hence hormones, being a fluid or *Khilt* must possess a Mizaj.

**Akbar Arzani:** Some Unani scholars consider thyroid hormones as *Khilt-e-Safra*. The domination of bilious humor (*Galba-e-Safra*) is associated with dryness of tongue and nasal mucosa, feverish feeling (excessive heat production), sinus tachycardia, and tremors<sup>[7]</sup>. These symptoms and signs are very similar to domination of thyroid hormones i.e. hyperthyroidism, on the contrary domination of phlegmatic humor (*Galba-e-Balgham*) is characterized by bradycardia, low volume pulse, sluggishness of skeletal muscles, soft skin, sluggish thinking<sup>[7]</sup>. These sign and symptoms are found in hypothyroid patients.

### Correlation between Thyroid Hormones and Mizaj

The concept of temperament symbolizes various physical as well as psychological tendencies of individuals in terms of

mass and energy i.e activity as heat and cold; reactivity as dryness and moisture. The concept of temperament is of great importance to clinicians of traditional medicine, both from the point of physiology and psychology a well as diagnosis and treatment. Temperament is determined by the nature and proportion of humors and their interaction in the body. The heat and cold in it may be identified with dispersive and aggressive aspects of energy, while moisture and dryness are related to receptive and resistance aspect of mass, respectively.

**Majoosi:** He stated in the chapter ‘temperament of testicles’ of his book *Kamil-Sanat* that excessive pubic hair growth, hair growth at the early age of puberty and thick, whitish semen formation at the early age of puberty are considered the signs of hot temperament of testes. He also said that excessive copulation and good penile erection also indicates *Har Mizaj* of testes<sup>[8]</sup>.

**Ibn Zuhr:** He stated that the person with *Har Mizaj* has high sexual desire. Such people enter in adulthood at an early age and their semen is thick and hot<sup>[9]</sup>.

Both Majoosi and Ibn Zuhr were very near to describe the functions of testosterone hormone and from above statement it can be concluded that the testosterone may possess *Har Mizaj* (Hot temperament), which needs further clinical research, but Mizaj of thyroid gland or thyroid hormones is not stated in Unani classical medical literature. Scientific correlation of thyroid hormones with basic and old aged concepts of Unani medicine i.e. Mizaj, will be a positive step in the direction of pharmacological treatment of thyroid disorders.

### Modern research on Thyroid hormones and Mizaj

A study, during 1985 to 1995, was done for better understanding and to rationalize the basic fundamental concept of Unani medicine and to scientifically validate the theories of basic fundamentals i.e. Mizaj and Akhlat. This study was done on 450 healthy individuals at CRIUM (Central Research Institute of Unani Medicine) Hyderabad. In this study various temperament (Mizaj) were correlated with various physiological and biochemical parameters along with total T3, and total T4 (thyroid hormones). The results were as:

**Damwi:** T3 and T4 should be present with a physiologically higher profile in Damwi. But the study is not in accordance with this expectation

**Safrawi:** T3 and T4 should be presented with a physiologically higher profile in Safrawi and the study is in accordance with this expectation

**Balghami:** In Balghami temperament, the level of T3 & T4 presented at physiologically lower level, in concordance with hypothesis

**Saudawi:** It should be at lower level in Saudawi. T4 exhibit lower range whereas T3 is at higher level<sup>[10]</sup>

Another study, in 2014 was done on free T3, free T4, and TSH correlation with different Mizaj on 100 healthy individuals. In this study free form of thyroid hormones were measured as these free forms of hormone correspond to the biologically available hormone pool. It is the free thyroid hormones that are physiologically active. According to this study free T3 (FT3) mean, within the normal range, was

slightly higher in *Damwi* and *Safrawi Mizaj* people in comparison to *balghami* and *saudawi Mizaj*, but was not statistically significant, and free T4 (FT4) did not show any correlation, within its normal range, with different Mizaj<sup>[11]</sup>. This study shows that there is no correlation between different Mizaj and free form of T3 and T4 but Thyroid stimulating hormone (TSH) is found significantly higher in *Balghami Mizaj* and then in *Saudawi Mizaj* in comparison to *Safrawi* and *Damwi*<sup>[12]</sup>. *Mizaj*, this reflects that thyroid stimulating hormone may be a *khilt-e-balgham* and posses a *Barid-Ratab Mizaj*. (saifi *et. al.* 2017)<sup>[12]</sup>.

### Conclusion

There are various quotations in classical literature of unani medicine which support existence of different endocrine glands and their secretions (hormones) with related disorders and treatment, but ancient literature is deprived of detailed knowledge of thyroid gland, related disorders and its Mizaj too. The concept of Mizaj and Akhlat have crucial role in making diagnosis and treatment. The early and cost effective diagnosis and treatment of thyroid disorders, is becoming a challenge in modern medicine as well as in unani medicine. According to previous clinical studies Thyroid Stimulating Hormone (TSH) is considered as a *khilt-e-bhalgham* and its Mizaj is *Barid ratab* which gives a clue about pharmacological treatment of hypothyroidism and hyperthyroidism, as well as T3 and FT3 are also higher in *Safrawi Mizaj* people, which is in accordance of the hypothesis.

Further correlation studies on thyroid hormones and Mizaj will be a positive step in the direction of diagnosis and pharmacological treatment of thyroid disorders.

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