



Full Length Research Article

PHYSIOLOGICAL VARIATION OF SERUM TSH (THYROID STIMULATING HORMONE) LEVEL IN DIFFERENT MIZAJ

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ABSTRACT

Thyroid Stimulating Hormone is secreted from the anterior pituitary and controls the synthesis and secretion of thyroid hormones from thyroid gland. Serum TSH level is the good indicator of thyroid functions and, is of great importance as a diagnostic tool in many thyroid disorders. Similarly in Unani medicine Mizaj is the indicator of domination or excess of a particular *khilt* in the body. *Mizaj* is considered as a diagnostic tool and also provide basis for pharmacotherapy. Unani research scholars remain skeptical about thyroid hormones and thyroid stimulating hormone (TSH) to be placed under which category of *Akhlat*, as thyroid gland (*Gadood-e-Darqiya*) and its hormones are not much described in classical literature of Unani medicine. A well established relation between Thyroid Stimulating Hormone (TSH) and Mizaj may provide an insight in the direction of diagnosis and thyroid disorder treatment. In this research young healthy individuals were enrolled and their *Mizaj* assessment along with serum TSH level was done. Thyroid stimulating hormone (TSH) is found significantly higher in *balghami Mizaj* and then in *Saudawi Mizaj* in comparison to *Safrawi* and *Damwi Mizaj*, this reflects that thyroid stimulating hormone may be a *khilt-e-balgham* and possess a *Barid-Ratab Mizaj*.

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INTRODUCTION

The thyroid hormones, thyroxine and tri-iodothyronine, play key role in the regulation of body development and govern the rate at which metabolism occurs in individual cells. (Roades & Bell, 2009). Thyroid hormones enhance the rate of oxygen consumption, utilization of fats, carbohydrates and proteins by the cells. In this respect, the thyroid gland undertakes a managerial role in the regulation of metabolic functions. The main regulator of thyroid function is thyroid-stimulating hormone (TSH), a glycoprotein synthesized and secreted from the thyrotrope cells of the anterior pituitary gland, which in turn is under the control of TRH secreted by the hypothalamus, (Braverman and Cooper, 2013). The formation and secretion of thyroid hormones are regulated by Thyroid Stimulating Hormone (TSH) through negative feedback system. Thyroid gland (*Gadood-e-Darqiya*) and its hormones are not much described in classical literature of Unani medicine. *Jalinoos* (129-200 AD) was the first physician who described the anatomy of thyroid gland (Jameson & De Groot, 2010).

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Unani physician Celsus, in the first century AD, firstly advised the removal of thyroid gland in goiterous hyperthyroidism and the first surgery (thyroidectomy) was performed by an Arab surgeon Abu Al-Qasim Zahrawi (936-1036 AD). Zahrawi also highlighted its causes, types, symptoms and treatment (Zahrawi, 2012). According to *Abu Sahl Masihi*, all fluids of the body are *Akhlat*. (Ahmad, ynm) Hence hormones, being a fluid or *Khilt* must possess a Mizaj. It remains a debatable issue among Unani research scholars whether hormones are *khilt-e-balgham* or *khilt-e-Safra*. Regarding thyroid hormones, some Unani scholars believe that thyroid hormones functions are similar to the functions of *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 (Arzani, 2010). 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 (Arzani, 2010). These sign and symptoms are found in hypothyroid condition, which is expressed by the excess of TSH. Moreover some Unani scholars consider that the certain hormones play a dominating role in types of *su-al-mizaj* (imbalanced

temperament). Thus, in *damwi al-mizaj* (hot and moist temperament) there seems an excess or domination of thyroid hormone; and in *balghami al-mizaj* (cold and moist temperament) there is a deficiency of thyroid hormone. (Ahmed, 1980) The above concepts of different Unani scholars reflect that TSH could be a *khilt-e-balgham* and posses cold temperament (*Haar Mizaj*). Serum TSH level is the good indicator of thyroid functions (American Thyroid Association. 2008c) and, is of great importance as a diagnostic tool in many thyroid disorders. Similarly in Unani medicine Mizaj is the indicator of domination or excess of a particular *khilt* in the body. So in this study thyroid stimulating hormone (serum TSH level) estimation was done of healthy individuals along with Mizaj identification to find the correlation between TSH and different Mizaj.

MATERIALS AND METHODS

A cross sectional, descriptive study to assess the range of TSH, in One hundred (100) healthy individuals of different Mizaj was carried out in the department of Munafe ul Aza of A & U Tibbia College, Karol Bagh, Delhi, during the period extended from 2014 to 2015.

Inclusion Criteria

- Individuals of 18 to 25 years of age
- Either sex

Exclusion Criteria

- Known cases of Hyperthyroidism or Hypothyroidism
- Pregnant women
- Individual with history of alcohol intake/tobacco chewing/smoking

Determination of Temperament

The temperament of each subject was assessed with the help of temperament assessment proforma, which is based on *Ajnas-e-Ashra* described in the Unani classical medical literature.

Determination of Thyroid Stimulating Hormone (TSH)

Blood Sample Collection

Individuals were called empty stomach in the morning for blood sample collection. 3 ml blood was drawn from median cubital vein by sterile, disposable 5 ml syringes. After that blood was collected in a plain vial and allowed to clot at room temperature for an hour and then serum was obtained after centrifugation for 5 minutes at 3000rpm in centrifugal machine.

Test Kits

Serological test of thyroid stimulating hormone (TSH) was done by URIT-660 Auto Analyzer and the testing kits of MERIL Company were used.

Principle

In this method, blood sample containing the native antigen (TSH in serum) are first added to anti-TSH antibodies coated

wells. Then enzyme labeled anti-TSH antibody are added and mix the reactant. These antibodies have high affinity and specificity for antigen i.e. TSH. Reaction between various TSH antibodies and native TSH (serum TSH) occurs forming a soluble sandwich complex. After equilibrium is attended, the antibody-bound fraction is separated from unbound antigen by decantation or aspiration. The enzyme activity in the antibody bound fraction is directly proportional to the native antigen concentration. The activity of the enzyme present on the surface of the well is quantified by reaction with a suitable substrate to produce colour. The normal reference range of TSH, as per test kit used, is given below.

Table 1. Normal Reference Range of TSH in Adults

	Mean (mIU/L)	Range (mIU/L)
TSH	1.85	0.39 – 6.16

Observation

Total 100 volunteers were randomly selected for Mizaj identification and determination of Thyroid Stimulating Hormone (TSH) as per inclusion criteria, out of which 6 individuals had high TSH value, above normal limit, so those volunteers were excluded from the study. Ninety four (94) volunteers completed the study.

Table 2. Distribution of subjects according to gender

Subject	No. Of individuals
Male	43
Female	51

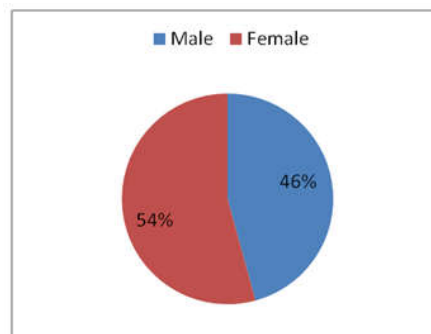


Fig. 1. Distribution of individuals according to gender

The distribution of participants was almost equal according to gender.

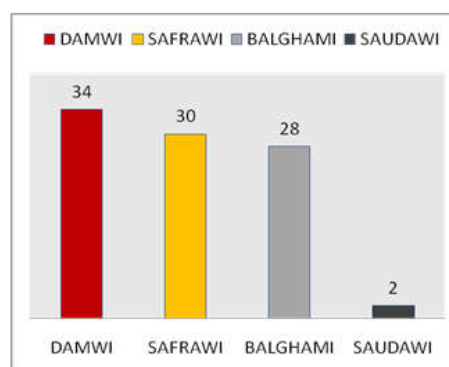


Fig. 2. Distribution of subjects according to their Temperaments (Mizaj)

The 94 volunteers were distributed according to their Mizaj as shown in figure 2 out of the 94 volunteers, *Damwi* Mizaj included 34, *Safrawi* included 30, *Balghami* included 28 and *Saudawi* included 2 volunteers. The maximum number of individuals was of *Damwi* Mizaj. It is because all participants were young individuals between the age group 18-25 years and the Mizaj of young people (*sinn-e-namu*) is *Damwi* as stated in Unani classical literature (Ahmad, ynm). The least number of individuals were in *Saudawi* Mizaj

Table 3. Mean & standard deviation of TSH in different Mizaj group

MIZAJ	TSH Mean±SD)
Damwi	2.13±0.93
Safrawi	2.02±1.21
Balghami	2.96±1.53
Saudawi	3.11±2.92

Mean of TSH value in *Saudawi* Mizaj individual is highest (3.11±2.92) among all Mizaj group followed by *Balghami* Mizaj (2.96±1.53), *Damwi* (2.13±0.93) and *Safrawi* (2.02±1.21). One way ANOVA test was applied to compare TSH mean of all four Mizaj groups i.e. *Damwi*, *Safrawi*, *Balghami* and *Saudawi* Mizaj group

Table 4. One way ANOVA for TSH

	SS	Df	MS	F	P
Between	16.471	3	5.490	3.462	0.020
Within	142.731	90	1.586	-	-
Total	159.202	93	-	-	-

Table 6. Statistical significance

COMPARISON	SIGNIFICANT AT p < 0.05	T
Damwi vs Safrawi	No	0.349
Damwi vs Balghami	No	2.583
Damwi vs Saudawi	No	1.069
Safrawi vs Balghami	Yes	2.841
Safrawi vs Saudawi	No	1.185
Saudawi vs Balghami	No	0.163

Statistical decision

Since computed F of 3.462 is greater than 2.71, therefore H_0 is rejected. As H_0 is rejected, it is concluded that the four Mizaj groups do not have the same TSH mean and at least two groups had significant difference in TSH mean.

P value: Since $3.462 > 2.71$, $p < 0.05$ ($p=0.020$)

Scheffé multiple range test (*Post hoc test*) was applied to determine which two groups have significant difference and test results are given below: As shown in the table the highest mean difference (M1-M2) in *Safrawi* vs. *Saudawi* and *Safrawi* vs. *Balghami* and from table *Safrawi* vs. *Damwi* is significant at $p < 0.05$ with 95% confidence but statistical significant group was *Safrawi* vs. *Balghami*. ($t=2.841$ and $p < 0.05$).

Conclusion

Based on the various observations it is found that Thyroid Stimulating Hormone (TSH), within the normal range, is highest in people having *Balghami Mizaj* and lowest in people having *Safrawi Mizaj* and it is in concordance with the experimental hypothesis of this research work. From this study it is clear that a possible correlation between thyroid stimulating hormones and Mizaj certainly do exist. It is also concluded that the high level of TSH can be considered as the preponderance of *Khilt-e-Balgham*.

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