

Serum Bilirubin as a Marker for the Assessment of *Mizaj* A Scientific Approach

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Among the basic concepts of Unani System of Medicine, *Mizaj* (Temperament) is one of the fundamental. According to Unani Medicine, the *Mizaj* of a person is due to that *Khilt* (humour) which dominates in body. Bilirubin is the orange-yellow pigment, hence included in *Khilt Safra*. In this study, serum bilirubin level was evaluated in the healthy volunteers having *Safravi* (bilious) and *Balghami* (phlegmatic) *Mizaj*. It was observed that the level of serum bilirubin in *Safravi* volunteers was found significantly higher ($p < .001$) than *Balghami* volunteers. The mean value of serum bilirubin in *Safravi* and *Balghami* volunteers were found to be 0.71 ± 0.17 and 0.51 ± 0.18 , respectively, showing that higher level of serum bilirubin is indicative of *Safravi Mizaj*.

Keywords: Serum bilirubin, *Mizaj*, *Safravi*, *Balghami*.

Introduction

For over a hundred years, the characteristics and behaviour of bilirubin has been of abiding interest to both clinicians and research investigators. Serum bilirubin is the orange-yellow pigment^{15, 19}. About 80-85% of the bilirubin is derived from the catabolism of haemoglobin present in senescent red blood cells. The remaining 15-20% of the bilirubin comes partly from non-haemoglobin haem containing pigments such as myoglobin, catalase and cytochromes and partly from ineffective erythropoiesis^{13, 16-17, 20-21}. Approximately 250-300 mg bilirubin is formed daily^{4, 6, 17}. Production from the haemoglobin takes place in the reticulo-endothelial cells of spleen, bone marrow and the liver. Attempts to

understand the bilirubin pathophysiology date back to Hippocrates, who proposed that balance of four *Akhlat* (*Dam*, *Balgham*, *Safra* and *Sauda*) was necessary for health and their disproportion was indicative of disease⁴.

The concept of *Mizaj* is one of the fundamentals of Unani medicine. Ancient physicians have discussed in detail and defined it to the best of their knowledge in Unani classical literature. *Mizaj* is the amalgam of a person's physical characteristics and his/her psychological and emotional attributes⁹. The temperament of person is accordingly expressed by the words sanguine (*Damvi*), phlegmatic (*Balghami*), choleric (*Safravi*) and melancholic (*Saudavi*), accordingly to the preponderance in them respectively of the humours-blood (*Dam*), phlegm (*Balgham*), yellow bile (*Safra*) and black bile (*Sauda*)³. These four temperamental personalities have varied characteristics. Hippocrates suggested that differences in the proportion of the four humours in the body were responsible for the differences observed among individuals^{2,5,18}. Domination of certain *Khilt* necessarily exerts its influence on *Mizaj* (temperament) of an individual. All the yellow fluids (and compounds) of the body are called as *Safra*¹. Bilirubin is the orange-yellow pigment, hence included in *Khilt Safra*.

This study was undertaken with following aims:

- to assess and compare the level of serum bilirubin in *Safravi* (bilious) and *Balghami* (phlegmatic) individuals.
- for the scientific validation of theory of *Mizaj* (temperament).
- to find out that whether serum bilirubin level can be used as a marker in the assessment of *Safravi* and *Balghami Mizaj*.

Being exactly opposite to each other in temperament and features, the individuals of *Safravi* and *Balghami Mizaj* can be better evaluated in terms of serum bilirubin. Hence in the study only those volunteers possessing *Safravi* and *Balghami Mizaj* were included.

Material and Methods

This study was carried out in the Post Graduate Department of Kulliyat at Ajmal Khan Tibbiya College, Aligarh Muslim University, Aligarh. One hundred forty eight (148) healthy volunteers, without any gender bias, having *Safravi* (bilious) and *Balghami* (phlegmatic) *Mizaj*, were randomly selected for the study.

INCLUSION CRITERIA

- Only *Safravi* (bilious) and *Balghami* (phlegmatic) healthy volunteers.

- Age group of 18-40 years.
- Without any apparent morbidity and history of diseases.

EXCLUSION CRITERIA^{6, 8}

- Medications, Addiction, Smoking, Alcoholism and Tobacco chewing.
- Pregnancy.
- Strenuous Exercise.

STUDY APPROACH

- Consent was obtained from every volunteer included in the study.
- Detailed history and full clinical examination were done to rule out any pathological conditions.

ASSESSMENT OF *MIZAJ*

An assessment of *Mizaj* of the volunteers were done on the basis of self designed proforma (questionnaire) prepared in the light of criteria described in Unani classical literature i.e. *Ajnas-e-ashra*¹¹.

CATEGORIZATION OF VOLUNTEERS

- The selected volunteers were divided into two groups according to their temperament as follows:
 - **Group *Safravi***: Comprised volunteers having *Safravi* (bilious) temperament.
 - **Group *Balghami***: Comprised volunteers having *Balghami* (phlegmatic) temperament.

Estimation of Serum Bilirubin

- ***Malloy and Evelyn method***^{10, 14} was adopted to estimate the Total Serum Bilirubin level.
- **Normal Values:**
- Total bilirubin: 0.2-1.0 mg/100 ml of serum or plasma.

Data obtained were cross matched and compared to assess that whether any variation and deviation in the levels of serum bilirubin between *Safravi* and *Balghami Mizaj*, appears or not. Statistical analysis was performed by applying t-test. Values found below 0.05 were considered significant.

Observations and Results

TABLE 1
Showing Distribution of Volunteers According to
***Mizaj* (Temperament)**

<i>Mizaj</i> (Temperament)	Frequency	Percentage
<i>Safravi</i>	87	58.78
<i>Balghami</i>	61	41.22
Total	148	100

In our study, out of 148 volunteers, 87 (58.78%) were *Safravi* and 61 (41.22%) were *Balghami*. The maximum number of volunteers were in the *Safravi* group.

TABLE 2
Showing Total Serum Bilirubin of
Male Volunteers Expressed as Mean + S.D.*

	<i>Safravi</i>	<i>Balghami</i>	Significance
Number of Volunteers	46	36	
Serum Bilirubin	0.72±0.16	0.45±0.25	t=5.4, p<.001**

*SD = Standard deviation

**Shows that the value is significant

Male *Safravi* volunteers have higher level of total serum bilirubin level than male *balghami* volunteers. The difference in the mean total serum bilirubin level between the male *Safravi* and *Balghami* individuals was found to be significant as shown in Table 2.

TABLE 3
Showing Total Serum Bilirubin of
Female Volunteers Expressed as Mean + S.D.*

	<i>Safravi</i>	<i>Balghami</i>	Significance
Number of Volunteers	41	25	
Serum Bilirubin	0.69±0.18	0.50±0.15	t=4.7, p<.001**

*SD = Standard deviation

**Shows that the value is significant

Female *Safravi* volunteers have higher level of total serum bilirubin level than female *Balghami* volunteers. The difference in the mean total serum bilirubin level between the female *Safravi* and *Balghami* individuals was found to be significant as depicted in Table 4.

TABLE 4
Showing Total Serum Bilirubin of Volunteers Expressed As Mean + S.D.*

	<i>Safravi</i>	<i>Balghami</i>	Significance
Number of Volunteers	87	61	
Serum Bilirubin	0.71±0.17	0.51±0.18	t=6.6, p<.001**

In this regard our analysis shows that mean and standard deviation of the serum bilirubin were higher in *Safravi* volunteers than the *Balghami* volunteers. The difference was found to be statistically significant.

Discussion

Several studies have now confirmed that the levels of total serum bilirubin in serum of healthy adult males are higher than in serum of healthy females^{6,7}. Here in this study as shown in Tables 3 and 4, male volunteers having *Safravi Mizaj* have higher level of serum bilirubin than the female *Safravi* volunteers. Ahmad¹ holds the view that when there is excess of *Safra* in a person his *Mizaj* (temperament) becomes *Safravi* (bilious). Hence, the yellow constituent of blood admixture, bilirubin content should be higher in *Safravi* volunteers than *Balghami*. Our study is in total conformity to Unani concept. Another study by Mayer¹² reveals that mildly increased circulatory bilirubin provide protection against coronary artery disease, while low concentrations of serum bilirubin are associated with increased risk of IHD. According to Unani concept, *Safravi* volunteers are thin and less prone to IHD as compared to *Balghami* volunteers. Therefore, the level of serum bilirubin should be higher in *Safravi* volunteers than *Balghami* volunteers. Our result is in accordance with this fact.

Conclusion

From the findings of this study, it may be concluded that individuals

having *Safravi* (Bilious) *Mizaj* (temperament) have higher levels of serum bilirubin, than the individuals possessing *Balghami* (phlegmatic) temperament. It may be suggested that serum bilirubin level can be used as a marker for the determination of *Safravi Mizaj*.

Further studies are undoubtedly needed in this direction to scientifically validate the theory of *Mizaj*.

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