

A Comparative Study of Somatotypes in Different *Mizaj-e-Insani*

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Greco-Arab system of medicine is based on fundamentals postulated by Hippocrates (460-377 B.C.). Besides other concepts, the humoral and temperamental (*mizaj*) theories are the back-bone of this system and a very important base-line of Tibb is the concept of *Mizaj-e-Insani* (human temperament) which revolves around the diagnosis and treatment modalities as well as specific constitution of an individual. But as modern mind always seeks for more information which can only be provided by research on modern lines with the support of methods which were not available to the ancients. Therefore a comparative study was conducted between different somatotypes and *Mizaje Insani* at Aligarh city of Uttar Pradesh, India. Subjects were adults of age 19-25 years. Human *mizaj* was assessed on the basis of proforma developed to reveal *Ajnase Ashra* (ten parameters) as given in Unani literature, whereas somatotypes were assessed on Carter and Heath ratings. Two Types of *Mizaj* were selected for study i.e. *Damvi* and *Balghami* and their morphology was compared with different somatotypes. Significant difference was found between *Damvi* and *Balghami* (*Mizaj*) of their endomorph and slightly insignificant was documented between *Damvi* and *Balghami* and it was found that that majority of *Damvi* were mesomorphs where as majority of *Balghami* were endomorphs, which is consistent with the concept of Unani System of Medicine i.e. people of *Damvi mizaj* are more muscular and robust whereas *Balghami mizaj* people have more fat deposition.

Keywords: Unani Medicine, Somatotypes, *Mizaj-e-Insani*, *Damvi*, *Balghami*, Ectomorphs, Endomorphs, Mesomorphs.

Introduction

The complex mechanism of human body and its functions are the most revealing aspects of nature. The founders of the Greco-Arab system of medicine, now popularly known by the name 'Unani System of Medicine' did not have the sophisticated tools of diagnosis. Even then they tried to understand the human body. They propounded various concepts which turned out to be the corner-stone of today's modern medicine¹. Besides other concepts, the humoral and temperamental (*mizaj*) theories are the back-bone of this system. Term *Mizaj* is often fallaciously translated as individual temperament or constitution. Actually *mizaj* gives a broad perspective to the condition of the body. It is an expression of the various morphological, psychological, as well as physiological tendencies of an individual in terms of mass and energy i.e. activity (Heat and Cold) and reactivity (Dryness and Moisture)². The morphological aspect of an organism or his/her constitution is just a reflection of his/her individual *mizaj*. *Mizaj* is one of the core concepts of Unani System of Medicine. Whole Unani therapy in the context of diagnosis and treatment revolves around this concept. According to the four types of humors found in human body, human *mizaj* is also classified as *Damvi* (hot and moist), *Balghami* (cold and moist), *Saudavi* (cold and dry) and *Safrawi* (hot and dry). Morphologically *Damvi* are mainly muscular where as *Balghami* are mainly fatty¹. Attempts to individualize human constitution are not peculiar to Unani medicine but,

- Charak and Susrata in 500 BC classified it as *Vata*, *Pitta* and *Kapha* type.
- Galen (138-200 A.D.) classified it as Sanguine, Choleric, Phlegmatic and Melancholic.

- Avicenna (980-1030 A.D.) classified it as *Damvi* (hot and moist), *Balghami* (cold and moist), *Saudavi* (cold and dry) and *Safrawi* (hot and dry).
- Rostan (1828) classified it as Musculaire, Cerebral, Phlegmatic, and Asthenic.
- Hess and Eppinger (1931) classified it into Sympatheticotonic and Vagotonic.
- Jung (1923) has divided into Extrovert and Introvert, whereas Sheldon (1940) divided into Mesomorph, Endomorph, and Ectomorph and so on³.

The somatotype is defined as the quantification of the present shape and composition of the human body. The principle of classifying human physique has enjoyed a high status in the history of man from as early as the 5th century B.C.⁴. It was also observed that the purpose of determining body composition is to: estimate the optimal body weight, formulate dietary recommendation, exercise prescription, monitor training at altitude and monitor changes in body composition⁵. An ideal body composition consists of low fat and high muscle mass⁶. Somatotyping is also defined as a scientific procedure used to describe morphology or the shape of the body in a quantitative manner⁷. Various systems for classifying physique have been proposed over the centuries leading to the system called somatotyping as proposed by Sheldon in 1940 and subsequently modified by others like Parnell in 1954 and Heath and Carter in 1967.⁵ This method is based on the assumption that every physique can be described in terms of the contributions of three basic components viz. endomorphy, mesomorphy and ectomorphy. The Sheldon Somatotype is concerned with body shape only. It is not influenced by size. It assesses genetically determined aspects of physique that are invariable and not capable of change (Watson, 1983).

Somatotype should therefore have been said to be referring to that part of physique, which does not change with age, nutrition or state of training. Recent findings however, have changed this view entirely in the other direction. "Sheldon believed that Somatotype was a fixed or genetic entity but the present view is that the somatotype is phenotypical and so amendable to change under the influence of growth, aging, exercise and nutrition"⁸.

Somatotyping appraises body shape and composition giving a quantitative summary of the physique as a united whole known as "somatotype". Carter and Heath continued to define somatotype as the quantification of the present shape and composition of the human body. Somatotyping is based upon the principle that the entire body conforms to three components, namely endomorphy or the first component-characterised by the predominance of the digestive organs, the softness and the roundness of contour throughout the body⁸.

Mesomorphy or the second component-characterised by the predominance of muscle, bone and connective tissue (or musculo-skeletal robustness relative to stature and weight).

Ectomorphy or the third component is characterised by the linearity and fragility of build with poor muscular development or relative linearity^{8,4,9}. Somatotype is expressed in a three number rating representing endomorphy, mesomorphy and ectomorphy components, respectively. The rating is always in this order. In this manner, a first number, endomorphy as relative fatness, a second number (always in the middle) is used to describe mesomorphy as relative musculo-skeletal robustness while a third number (the last) is used to describe ectomorphy or relative linearity or slenderness of physique. For example, a 3-5-2 gives the magnitude of each of the components in the fixed order. That is, this individual's endomorphy is 3, his mesomorphy is 5 while his ectomorphy is 2. Carter and Heath (1990) consider ratings on each of the components less than or equal to 2 to 2 1/2 low, 3 to 5 are moderate or normal while 5 1/2-7 are high. Ratings of 7 1/2 and above are considered extra high and abnormal. Theoretically, there is no upper limit to the ratings, and values of 12 or more occur in very rare instances. According to De-Ridder "the unique combination of three aspects of physique into a single three-number expression is the strength of the somatotype concept". Somatotype has also been used to compare the relative shape of men and women and as a tool in the analysis of "body image"^{10,5}.

Therefore a study was conducted to analyze the relation between *Damvi* and *Balghami Mizaj* and different Somatotypes.

Limitations of the Study

- 1) Only Males from Aligarh district were recruited for the study;
- 2) *Damwi* and *Balghami Mizaj* were taken as the variables for the study;
- 3) Anthropometric method by Carter and Heath (1990) was adopted to measure the Somatotypes of the subjects;
- 4) Assessment of *Mizaj* was based on the subjective parameters as defined by ancient Unani Physicians.

Subjects

A total of fifty males (25 each of both the variables) were randomly selected for this study from the Aligarh district, U.P., India. The age of the selected subjects were ranged between 19 to 25 years.

Instrumentation

The *mizaj* of human body was assessed by using the subjective parameters given in ancient Unani literature known as *Ajnas-e-ashra* (Ten Parameters).

Anthropometric data were collected using the protocol measurements as recommended by the International Society for the Advancement of Kinanthropometry¹¹. The following research instruments were used for this study:

- Weighting Scale: Hanson model portable type (made in Ireland) calibrates from 0 to 180 kg and recorded to the nearest 0.1 kg. This was used to measure total body weight in kilograms.
- Stadiometer: Used to measure subjects' height.
- Skinfold Calliper: The medical skinfold calliper 5028/0029 manufactured in Maryland U.S.A. was used to measure skinfold thickness at the relevant body sites. The calliper is graduated from 0 mm to 67 mm, with a constant pressure of 10 g/mm².
- Anthropometric Tape: A non-elastic tape measure, calibrated in centimetres with millimetre graduations was used for measuring girths.
- Board Blade Anthropometer: This instrument calibrated in centimetres with millimetres graduations was used to measure body breaths.

Procedure

Informed consent of participants was obtained at the outset of the study. Measurements were taken in the order of age, weight, height, skin fold (triceps, sub scapular, suprailiac, calf, and supraspinale), Girths (biceps and calf), and Diameters (humerus and femur). Each indicator was measured twice and the average was taken. The decimalised equation method by Heath-Carter (1990) was used to calculate the somatotype of participants into the somatotype categories as follows:

Somatotype in Gradings

All the three components of somatotypes were calculated with the following formulae:

(a) Endomorphy

$$\text{Endomorphy} = -0.7182 + 0.1451 * \Sigma\text{SF} - 0.00068 * \Sigma\text{SF}^2 + 0.000014 * \Sigma\text{SF}^3$$

[Where ΣSF = (sum of triceps, sub scapular and supraspinale skin folds) multiplied by (170.18/height in centimeter). This is called height-corrected endomorphy and is the preferred method for calculating endomorphy.

(b) Mesomorphy

Mesomorphy = 0.858 * humerus breadth + 0.601 * femur breadth + 0.188 * corrected arm girth + 0.161 * corrected calf girth-height * 0.131 + 4.5

(Subtract the triceps skin fold and calf skin fold from the arm girth and calf girth, respectively).

(c) Ectomorphy

Ectomorphy was determined by comparing the HWR ratio with following underlined values:

$$\text{HWR} = \frac{\text{Height in cms}}{\sqrt[3]{\text{Weight in Kg}}}$$

- If HWR is greater than or equal to 40.75 then ectomorphy = $0.732 * \text{HWR} - 28.58$
- If HWR is less than 40.75 and greater than 38.25 then ectomorphy = $0.463 * \text{HWR} - 17.63$
- If HWR is equal to or less than 38.25 then ectomorphy = 0.1

Statistical Analyses

The t test was used to determine the difference between the means of *Damwi* and *Balghami Mizaj* score. Further the level of significance was set at 0.05 levels with 48 degree of freedom.

Results

TABLE 1
Descriptive Statistics of the Somatotypes of *Damwi* and *Balghami*

Somatotypes	<i>Damwi</i>		<i>Balghami</i>	
	Mean	SD	Mean	SD
Endomorph	2.32	0.47	3.47	0.67
Mesomorph	4.59	1.20	4.37	0.93
Ectomorph	3.19	1.31	2.72	1.12

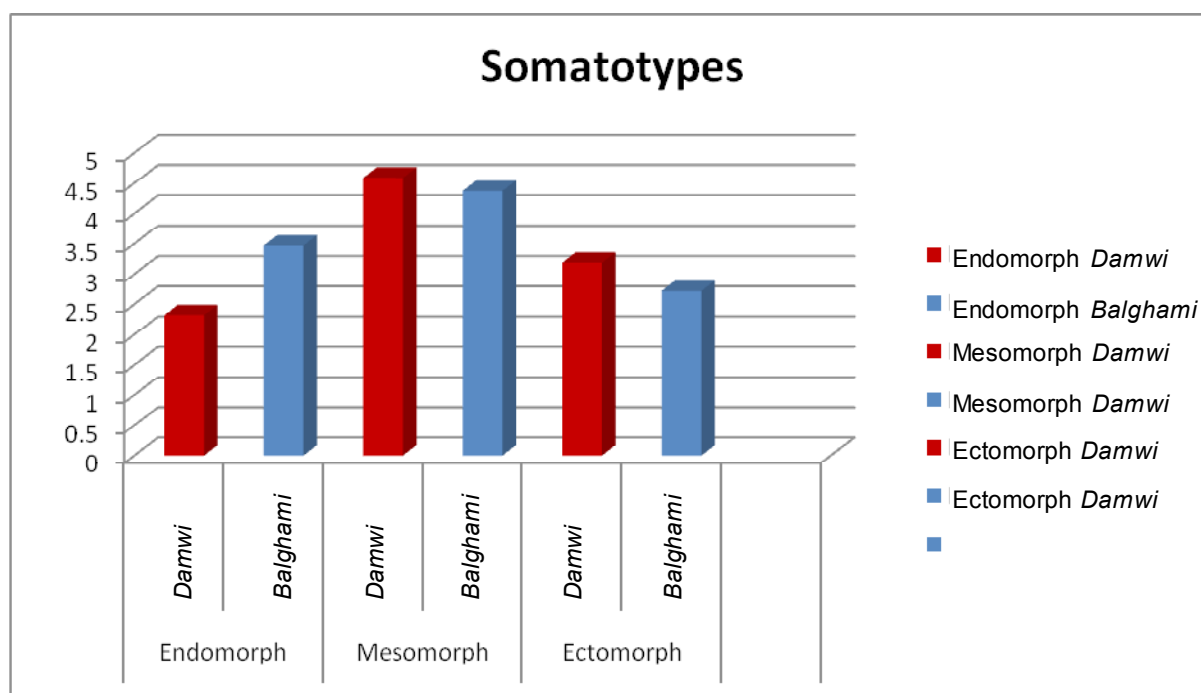


Fig. 1

Graphical representation of comparison of means of the somatotype between *Damwi* and *Balghami*

TABLE 2
Indicating Mean Difference of Endomorph Between *Damwi* and *Balghami*

	Mean	SD	Cal t
<i>Damwi</i>	2.32	0.47	6.321*
<i>Balghami</i>	3.47	0.67	

*Significant at 0.05 level of significance

Tab t = 2.021

Table 2 indicates that there was a significant difference between *Damwi* and *Balghami* of their Endomorph at 0.05 level of significance with 48 degree of freedom.

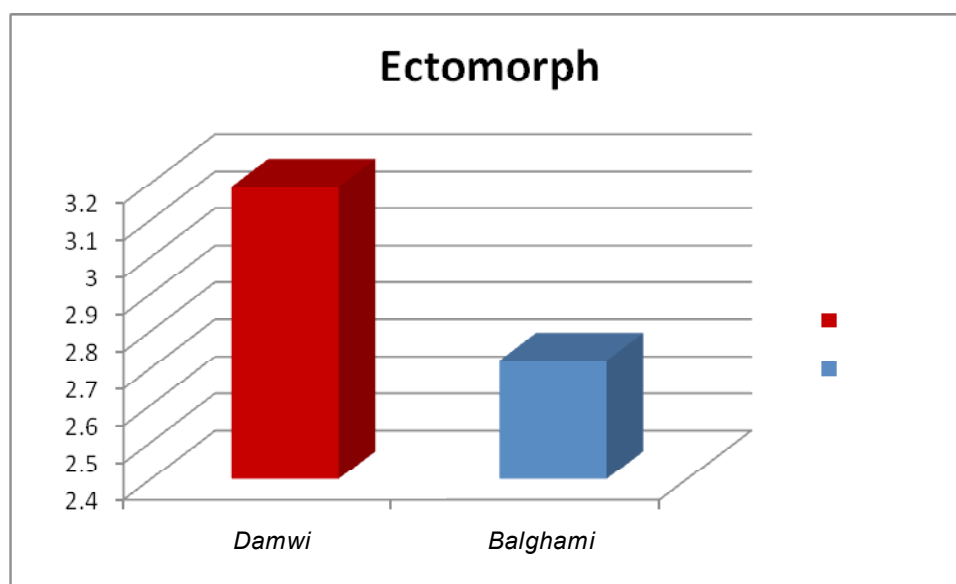


Fig. 2

Graphical representation of comparison of mean of the Endomorph between *Damwi* and *Balghami*

Table 3
Indicating Mean Difference of Mesomorph Between *Damwi* and *Balghami*

	Mean	SD	Cal t
<i>Damwi</i>	4.59	1.20	1.523
<i>Balghami</i>	4.37	0.93	

*Significant at 0.05 level of significance

Tab t = 2.021

An insignificant difference was documented between *Damwi* and *Balghami* of their mesomorph at 0.05 level of significance with 48 degree of freedom.

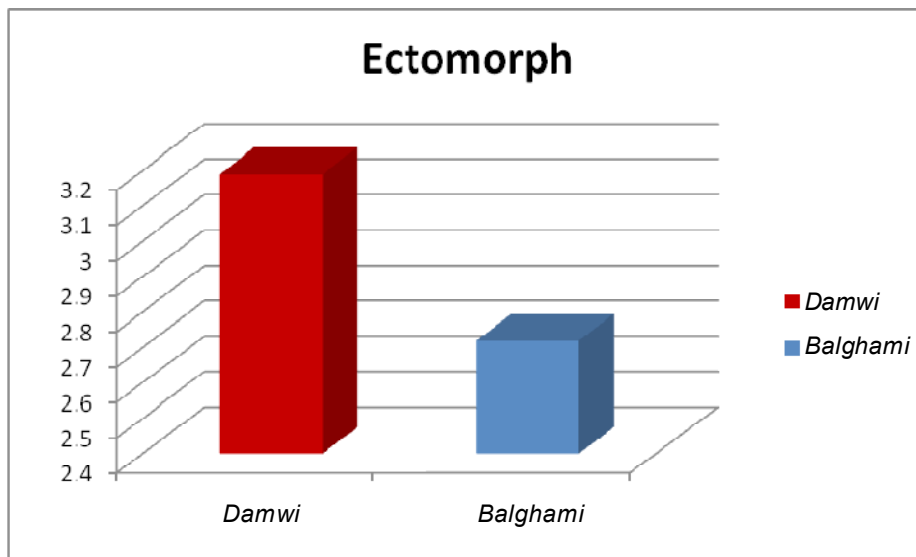


Fig. 3

Graphical representation of comparison of mean of the Mesomorph between *Damwi* and *Balghami*

TABLE 4
 Indicating Mean Difference of Ectomorph Between *Damwi* and *Balghami*

	Mean	SD	Cal t
<i>Damwi</i>	3.19	1.31	3.124*
<i>Balghami</i>	2.72	1.12	

*Significant at 0.05 level of significance

Tab t = 2.021

It is evident from Table 4 that significant difference was found between *Damwi* and *Balghami* of their ectomorph at 0.05 level of significance with 48 degree of freedom.

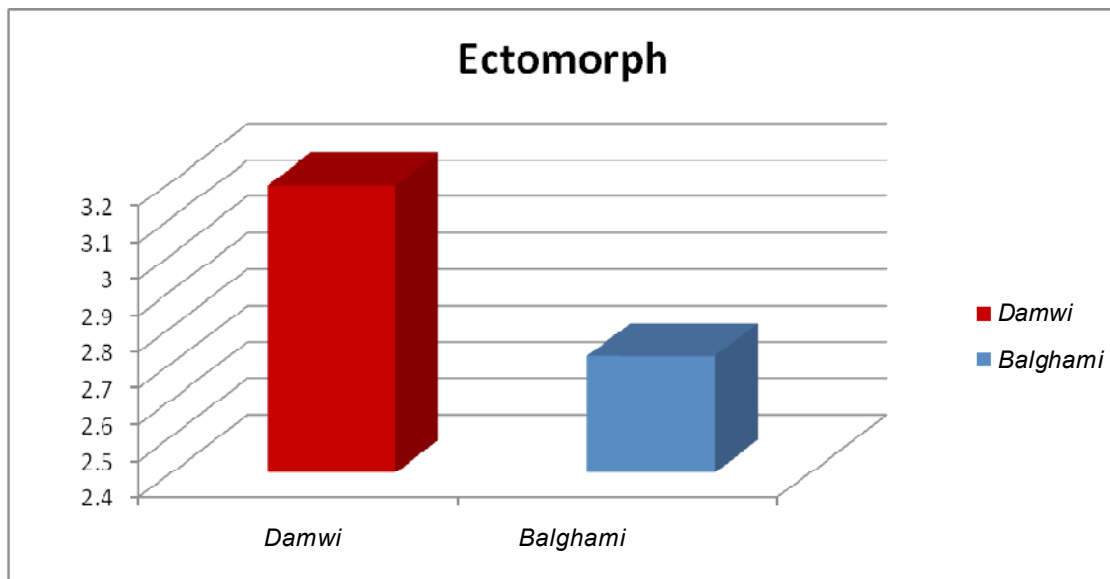


Fig. 4

Graphical representation of comparison of mean of the ectomorph between *Damwi* and *Balghami*

Discussion

The result of the study showed that there was a significant difference on the level of endomorph between *Damwi* and *Balghami*. *Balghami* tend to have more fat percentage than *Damwi*.

The result of the study showed that insignificant mean difference was documented between *Damwi* and *Balghami* in terms of their mesomorph. There was not much difference in the mesomorphy status of the *Damwi* and *Balghami* but the *Balghami* showed less musculature than *Damwi*.

The result of the study revealed that significant mean difference was found between *Damwi* and *Balghami* in terms of their ectomorph. *Damwi* are found to be more ectomorphic than *Balghami*. But the point of issue here is that the literature of Unani System of Medicine does not report the ectomorphic characteristic in *Damwi* and *Balghami* mizaj. Hence more research is required to determine this phenomenon of one's personality, especially with large number of data.

Conclusion

On the basis of results obtained it is concluded that there was a significant statistical difference between *Damwi* and *Balghami* in their Endomorph and Ectomorph. Insignificant difference found in Ectomorph of *Damwi* and *Balghami*. Moreover, the findings are in line with the literature of Unani System of Medicine except the ectomorphic characteristic, for which further research work is required in future.

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