

Anthropometric Study of Facial Morphology in Male Population of Haryana and Himachal Pradesh

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ABSTRACT

Facial anthropometry is well-known for its implications in forensic science, anatomy, human biology, criminology and physical anthropology. Human face is a distinct criterion in personal identification and is a reflection of uniqueness of every individual. Facial indices are of much importance in plastic and cosmetic surgery. The aim of present study is to examine the facial length, facial width, facial index and to find out the facial type in two population groups (Haryanvi and Himachali males). Facial index is the ratio of the morphological facial height to facial width and multiplied by 100. The present study was conducted on 200 healthy males (100 Haryanvi and 100 Himachali) in the age range 18-40 years. There was statistically significant difference found in facial height in both the populations. Facial height was found more in Haryanvi males than the Himachali males. There was no statistically significant difference found in bizygomatic width in both the populations. No significant difference found in facial index in both the population. Majority of the subjects in both the populations were with Hypereuryprosopic face followed by Euryprosopic face.

Key words: Facial index, face length, face width, anthropometry

INTRODUCTION

Face is the most essential and interesting area of the body in many aspects. On meeting some person the face is the first to be observed. The facial alterations always help us to differentiate the different ethnic people. The facial dimensions have got special attentions in the different medical regulations and artistry. Facial analysis is the first step in the assessment of patients in cosmetic or reconstructive procedure of the face. The most important facial dimensions are facial height and width (bizygomatic distance) that determine the total facial index.

Facial morphometry indicates the changes in facial shape in a given population. It is also useful in permitting changes between races, ethnic groups, sexes

and even members of the same family. Morphometry of the face is always an interesting subject for artists and plastic surgeons. The facial parameters are useful in various situations such as searching a missing person, recognizing a criminal, to find out a person in accidental cases like road accident, burn and natural disasters. The parameters of face are useful in curing congenital and post-traumatic deformity of face. ^[1]

The face is doubtlessly one of the most essential sources of communication and interaction with the environment and it carries information that helps in the identification of individual. The features of face like bones, muscles, cutaneous and subcutaneous layers all contribute to a unique morphology in a single person. Face

has been extensively studied by scientists, clinicians, artists, and they all have tried to measure and reproduce some of its characteristics. [2]

The contour of face has always been an interesting topic for anatomists, anthropologists, plastic surgeons, and artists and also the identification of an individual's race is an essential component in forensic identification and reconstructive surgery. [3]

MATERIALS AND METHODS

The present study was done on 200 males including 100 from Haryana and 100 from Himachal population aged 18-40 years. The whole study was conducted at the department of anatomy, MMIMSR, MMU, Mullana. The study was undertaken after approval by institutional ethics committee. Subjects with earlier trauma, congenital malformation of face and head & neck were excluded from the study.

Following were the decided parameters measured on all the subjects. The parameters were measured in millimeter.

1. total facial height
2. width of bizygomatic arch
3. facial index

In the present study the parameters of face were measured on the subjects by using vernier caliper & spreading caliper.

Following were the various somatometric landmarks used for the measurements of parameters:

1. GLABELLA (g) - the point on the protuberance of lower forehead above nasal root & between the eyebrow ridges intersected by mid-sagittal plane (figure 1).
2. ZYGION (zy) - the most laterally placed point on the zygomatic arch (figure 1).

3. GNATHION (gn) - the lowest point on the lower margin of lower jaw intersected by mid-sagittal plane. This point can be palpated on lower jaw from behind and slightly anterior to chin (figure 1).

Measurements taken on the face of the subject –

TOTAL FACIAL HEIGHT – distance between glabella and gnathion (figure 1).

WIDTH OF BIZYGOMATIC ARCH – straight distance between two zygions (figure 1).

MORPHOLOGICAL FACIAL INDEX

Total facial height

$$= \frac{\text{Total facial height}}{\text{Width of bizygomatic arch}} \times 100$$

Width of bizygomatic arch

Statistical analysis: All the data was compiled and entered in Microsoft excel worksheet as master chart. The measurements were statistically analyzed (arithmetic mean and standard deviation were calculated) and tabulated.

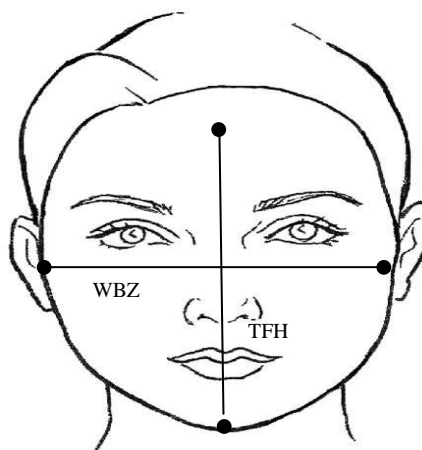


Figure 1: Measurements of total facial height (TFH) and width of bizygomatic arch(WBZ).

RESULTS

TABLE 1: COMPARISON OF FACIAL PARAMETERS IN HARYANA AND HIMACHAL

VARIABLES		Haryana Population (N=100) Mean±Sd(cm)	Himachal Population (N= 100) Mean±Sd(cm)	p-value
FACE	Facial height	11.99±1.21	11.85±1.08	0.0007***
	Bizygomatic width	15.44±0.83	15.42±0.97	0.8757
	Facial index	76.96±6.84	76.11±5.94	0.3492

Statistically significant difference was found in facial height in both the populations. Facial height was found more in Haryanvi males than the Himachali males. No statistical difference was found in bizygomatic width in both the populations. There was no significant difference found in facial index in both the population (Table 1).

TABLE 2: FACIAL TYPES ACCORDING TO FACIAL INDEX (PROSOPIC INDEX) IN HARYANA AND HIMACHAL POPULATION

VARIABLES	Haryana Population		Himachal Population	
	(N=100)	%age	(N=100)	%age
Hypereuryprosopic (very broad face) Facial index(≤ 79.99)	61	61%	69	69%
Euryprosopic (broad face) Facial index(80-84.99)	22	22%	24	24%
Mesoprosopic (round face) Facial index(85-89.99)	11	11%	4	4%
Leptoprosopic (long face) Facial index(90-94.99)	4	4%	2	2%
Hyperleptoprosopic (very long face) Facial index(≥ 95)	2	2%	1	1%

The above table shows the comparison of various facial types in Haryanvi and Himachal male population. It was found that most of the subjects in both the populations were with Hypereuryprosopic face (Facial index ≤ 79.99) followed by Euryprosopic face (Facial index: 80-84.99). (Table 2).

DISCUSSION

Anthropologists distinguish groups of people on the basis of common origin; on whether they were living or had lived in certain defined regions and had possessed different characteristic features in their appearance. Differences are found in groups who live in different geographical areas within the single species. This is due to individual's biological, social and other elements. In the beginning of last century, the patterns of classification of Indian people were largely based on morphological and anthropometric characters. Intra- and inter-population differences are affected by ecological, biological, geographical, racial, gender, and age factors.

There is a genetic influence on the morphological features of a population, but the expressions of genes are affected by environmental and other elements. Several theories are given which are related to the effects of temperature on facial form and head shape. Buretic-Tomljanovic et al observed that there is significant effect of

environmental factors such as diet, climate, and weather on body height and craniofacial variability in adults who were aged 18-21 years. [4]

In the present study dominant type of face shape in the males of Haryana and Himachal region are hypereuryprosopic which is followed by euryprosopic, mesoprosopic, leptoprosopic, and hyperleptoprosopic.

Kataria et al. studied that face shape in North Indian males and females are Mesoprosopic followed by Euryprosopic, Hypereuryprosopic, Leptoprosopic and Hyperleptoprosopic. [5]

Prasanna et al. found south Indian males had long faces (leptene) to round faces (mesene) and females had broad (euryene) to long face types whereas north Indian males had hyperleptoprosopic faces and females had hyperleptoprosopic to mesene faces.

Trivedi et al. found that majority of population had euryprosopic facial type followed by mesoprosopic type, hypereuryprosopic, leptoprosopic, and hyperleptoprosopic type [6]

Kurnia et al. found that the average facial type in Chinese male students was leptoprosopic while in female students was mesoprosopic type. [7]

Yesmin et al. obtained that dominant type of facial shape for Malaysian males and females was mesoprosopic (round face).

The second commonest type of facial shape for females was euryprosopic (broad face). The least common facial shape was hyperleptoprosopic (very long face).

CONCLUSION

In present study, we conclude that facial height of Haryanvi males was more than Himachali males. The predominant face type for both populations was Hypereuryprosopic followed by Euryprosopic type. Study has importance in cosmetic surgery, facio-maxillary surgery, plastic surgery and in forensic science. This study will serve as a basis of comparison for future studies on Haryana and Himachal population.

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How to cite this article: Kumar P, Kaur B, Bala M. Anthropometric study of facial morphology in male population of Haryana and Himachal Pradesh. Int J Health Sci Res. 2020; 10(3):28-31.
