The Anthropometric Variation among Haryanvi Populations

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Abstract: ***Facial anthropometry is important for determining race and sex of an unidentified individuals .The present study was conducted in Department of Anatomy, MM institute of medical sciences & research, Mullana (Ambala), on 800 Haryanvi adults comprising of 400 males and 400 females aged 18 to 40 years. Prior informed written consent was obtained from subjects. Inclusion and exclusion criteria for the study were predefined. The purpose of study was to create, evaluate data on face anthropometry. Three measurements, the morphological facial length, bigonial diameter and stature were taken by using standard anthropometric instruments. From the study it was concluded that the mean morphological facial length was 11.07cm in male and 10.21cm in female. Bigonial breadth was 11.45cm in male & 10.33 in female and the stature was 168.71 cm in male and 155.18 cm in female. So, all the measurements were more in males as compared to females. The morphological facial length frequency showed that 54% males and 35.75% females have very low facial length, 28% male and 16.25% female have low, 15.25% males and 18.75% females have medium, 2.5% males and 14.75 % females have high and 0.25% males and 14.5% females have very high facial length. The stature frequency showed that 9.5% males and 0.75% females have very tall stature, 28.25% males & 33.25% females have upper medium stature, 23% males & 26.75% females have medium stature, 7% males & 18.25% females have very lower stature and 2.75% males & 7% females have short stature and 0.25% males have very stature.***

Keywords: Anthropometry, Haryanvi, population, face, facial length

1. Introduction

Anthropometric measurements especially facial measurements are important for determining various face shape. These anthropometric studies are conducted on the age, sex and racial/ethnic groups in certain geographical zones.(William et al, 1995, del sol,2005, Golalipour et al, 2007, Shah and Jadhav). Geographic variations in body size and shape in human is well documented[5]. Climatic adaptations and nutritional factors are also found to be detrimental to body shape and size.(Jasuja et al,2011). In view of the fact that no two persons are alike in all their measureable characters, that the latter tend to undergo change in varying degrees from birth to death, in health and in disease, and since persons living under different conditions, and members of different ethnic groups and the crosses between them, frequently present differences in bodily form and proportion[6.] A large number of studies on various body measurements of different population of the world had been carried out to use them in various fields of science as ergonomics, medicine, and forensics etc[7-11]. Lees et al[12] studied proportionality of faces of Asian and American Caucasians by measuring various cranio-facial measurements and concluded that these variations may be of significant consideration in reconstructive maxilla-facial and aesthetic surgery. In forensic applications, personal identification is one such field where facial measurements play a very important role, particularly in different techniques of facial reconstruction where these measurements may help forensic artist to make out final face irrespective of the method used[13]. In light of the above studies in present paper an attempt has been made to study the face variations based on anthropometric measurements among the Haryanvi populations.

2. Material and Methods

The present study was conducted on 800 adult Haryanvi Banias (400 of either sex). Prior informed consent both in English & Vernacular were obtained from subjects in writing. The subjects of age group 18-40 years were included in the study .The subjects were apparently healthy and without any cephalo-facial deformity. A series of three somatometric landmarks and three anthropometric measurements were taken on 800 Haryanvi Banias. The methodology for facial measurements was adopted from Krishan and Kumar[14] & Montague A. MF[15]

3. Somatometric Measurements

a) **Morphological facial length:** It is straight distance from the nasal root (nasion) to the lowest point on the lower border of the mandible in the mid sagittal plane (gnathion
b) **Bigonial diameter:** It is the maximum breadth of the lower jaw between two gonion points on the angles of mandible.
c) **Stature:** It is the vertical distance between highest point on the head (vertex) and the floor. The measurements were taken with the help of an anthropometric rod, sliding caliper, spreading caliper and measuring steel tape to the nearest 0.1.

4. Observations and Results

On the basis of three measurements the usual constants for various facial measurements like Mean, SD, and SEE of male and female under the study are presented in Table-1. From the observations of tables it is revealed that

Table 4.1: Mean, SD and SEE & Range of various facial measurements & stature among male & Female

Parameters	*Sex*	*Mean*	*S.D*	*S.E.M*	*Range*	
					Min	*Max.*
Morphological facial length	M	11.07	0.7	0.035	8.5	13.1
	F	10.21	0.94	0.047	8.5	12.6
Bigonial diameter	M	11.45	1.1	0.055	9.3	14.2
	F	10.33	0.75	0.037	8.4	12.4
Stature	M	168.7	5.46	0.273	152	189
	F	155.2	4.62	0.231	142	182

Table 4.2: Studies Showing Comparison Of Mean Face Length Of The Present Study With Previous Studies

Autor	Population	Sex	Face Length (CM)
	Azerbaijan	M	12.13
		F	11.16
	Singaporean Chinese	M	12.36
		F	11.49
	Vietnamese	M	12.12
		F	11.31
Farkas et al.	Thai	M	12.35
		F	11.28
	Japanese	M	12.28
		F	11.38
	Polish	M	11.75
		F	11.16
Patil & Mody	Central Indian population	M	12.677
		F	1.411
Sahni et al	Northwest Indian Population	M	11.25
		F	10.8
Jibonkumar & Lilanchandra	Kabuis of Imphal Valley	M	11.25
		F	----
Aghnihotri et al	Indo-Mauritian Population	M	11.58
		F	11
Krishan & K	North Indian kolis	M	10.24
Krishan	North Indian Gujjars	M	10.81
Present study	Haryanvi Banias	M	11.07
		F	10.21

Table 4.3: Studies Showing Comparison Of Mean Bigonial Diameter Of Previous Studies With Present Study

Author	Population	Males	Females
Jibonkumar & Lilanchandra	Kabuis of Imphal Valley	14	-
Krishan & Kumar	North Indian Kolis	8.34	------
Krishan	North Indian Gujjars	9.783	-------
Sahni et al	Northwest Indians	10.64	10.26
Pelin et al	Turkish Populations	10.361	-------
Agnihotri et al	Indo-Mauritian. Populations	10.55	9.9
Present Study	Haryanvi Banias	11.45	10.33

Table 4.4: Studies Showing Comparison Of Mean Stature Of Previous Studies With Present Study

Author	*Population*	*Males*	*Females*
Bale et al.	Caucasian Populations	178.13	--------
Jadhav & Shah	Gujarat Populations	165.92	------
Ryan& Bidmos	Indigenous South Africans	153.27	143.08
Jibonkumar &	Kabuis of Imphal Velly	162.29	------
Kalia et al	Mysorean patients	171.65	155.67
Krishan & Kumar	North Indain Kolis	152.647	------
Krishan	North Indian Gujjars	172.31	- ------
IIayperuma	Srilankans	162.95	152.48
Pelin et al	Turkish Populations	175.314	-----
Agnihotri et al	Indo-Mauritian Populations.	173.4	157.36
Asha and Prabha	South Indian Populations	169.62	156.82
	North Indian Populations	168.86	156.39
Giurazza et al	Caucasians of Rome(Italy)	167	156
Present Study	Haryanvi Banias	168.71	155.18

Table 4.5: Classification of morphological facial length among Haryanvi population Males & Females

Class	*Male(400)*			*Female(400)*		
	Range (cm)	*Number observed*	*%age*	*Range (cm)*	*Number observed*	*%age*
Very low	X-11.1	216	54	X-10.2	143	35.75
Low	11.2-11.7	112	28	10.3-10.7	65	16.25
Medium	11.8-12.3	61	15.3	10.8-11.3	75	18.75
High	12.4-12.9	10	2.5	11.4-11.9	59	14.75
Very high	13.0 & above	1	0.25	120 & above	58	14.5

All the classification and ranges are as per Lebzelter and Saller.(cited from Singh & Bhasin, 1989)

Table-4.6: Classification of stature among Haryanvi population (Males &Females)

	Male(400)			*Female(400)*		
Class	*Range (cm)*	*Number observed*	*%age*	*Range(cm)*	*Number observed*	*%age*
Pygmy	Under 129.0	Nil	---	Under 120.9	Nil	---
Very short	130.0-149.0	1	0.25	121.0-139.9	Nil	----
Short	150.0-159.9	11	2.75	140.0-148.9	28	7
Lower medium	160.0-163.9	28	7	149.0-152.9	73	18.25
Medium	164.0-166.9	94	23.5	153.0-155.9	107	26.75
Upper medium	167-169.9	113	28.25	156-158.9	133	33.25
Tall	170-179.9	135	33.75	159-167.9	56	14
Very tall	180-199.9	18	4.5	168-186.9	3	0.75
Gaint	200 & above	Nil	---	187& above	Nil	-----

All the classification and ranges are as per Martin and Saller (1957).

5. Discussion

Mean morphological face length, value in males was 11.07cm & 10.21 cm in females. The mean values were more in males as compared to females. This is in agreement with the studies done by previous authors. The mean facial lengths of all the previous studies done on various population groups of the world are higher than the present study both in males and females except North Indian Kolis (Krishan & Kumar) and North Indian Gujjars (Krishan) where it was less than the present study in males.

The mean bigonial diameter of present study is more in males as compared to the females. While comparing the present study with the previous studies, the results of present study are in agreement with the previous studies.

In present study, values of mean bigonial diameter of males were found to be higher than the previous study conducted by Krishan & Kumar , Krishan , Pelin et al , Sahni et al & Aghnotri et al but lower than the study of Jibonkumar & Lilanchandra on Kabuis of Imphal Valley. The mean bigonial diameter of the females of the present study is almost similar to the study of
Sahni et al on North Indian Populations but higher than the Indo-Mauritian population

In present study, the mean values of stature in male & female were 168.71 cm and155.18 cm respectively. The mean values were more in males as compared to females.

The mean values of stature of the present study were higher than the Indigenous South Africans, Srilankans, Caucasians of Rome (Italy) but lower than the Caucasian population studied by Bale et al, Turkish population, Indo-Mauritian population. The study when compared with Indian studies on the mean values of stature are higher in Haryanvi Banias than the Gujarat Population, Kabuis of Imphal Valley and North Indian Kolis, but lower than the South Indian population, Mysorean population(south Indians), North Indian Gujjars and almost similar to the North Indian population.

6. Conclusion

On the basis of anthropometric measurements it can be concluded that Haryanvi Bania's morphological face length (mean) was 11.07cm with minimum 8.5cm & maximum 13.1cm in males & 10.21cm (mean) with minimum 8.5cm and maximum 12.6cm in females. The range variation among males was very low (54%), low (28%), medium (15.25%), high (2.5%) and very high (0.25%) and in female the range variation was, very low (35.75%), medium (18.75%), low (16.25%) followed by high (14.75%) and very high (14.5%). The bigonial breadth varies from 9.3cm to 14.2 cm with mean 11.45 cm in males and 8.4cm to 12.4cm with mean 10.33cm in females. Stature varies from 152cm to 189 cm with mean 168.71cm in males and 141.5 cm to 182 cm with mean 155.18 cm in females. The upper medium stature occur in highest frequency (28.25%), followed by medium (23.5%), tall (9.5%), lower medium (7%), short (2.75%) and very short 0.25% in male whereas in female, upper medium (33.25%), medium (26.75%), lower medium (18.25%) followed by tall 14%, short(7%) and very tall 0.75%. Data of this study will be very useful to orthodontists, plastic surgeons, anatomists, facio-maxillary surgeons and anthropologist.

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