RESEARCH

STUDY OF CEPHALO-FACIAL INDICES AMONG 600 HARYANVI ADULTS

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Abstract

Background: Each part of body has a definite and proportional relationship with other part. The objective is to access the bigonial diameter and bizygomatic diameter and maximum head breath and to find out the various cephalo-facial indices. i.e jugo-mandibular index & chervin's transverse facial index. **Materials and Methods:** The study was conducted on Haryanvi population comprising of 300, males and 300 females. Measurements were taken using standard anthropometric instruments. i.e. varnier caliper. The data were analyzed by statistical software. **Result:** The mean bigonial diameter was 11.45 cm in males and 10.33cm in females. The mean bizygomatic diameter was 13.0 cm in males and 12.35cm in females. The mean maximum head breadth was 13.11cm in males and 12.95cm in females. Mean jugomandibular index was 87.53 in males and 83.64 in females. The mean transverse facial index was 97.77 in males and 95.36 in females. All parameters were more in males as compared to females. **Conclusion:** Hence these data can be used when unknown remains are brought for forensic examination and also can be used in bioarchaeology to make estimations of biological profile.

INTRODUCTION

Anthropometry can be defined as the art and science of measurements of physical dimensions, mass and strength of parts or whole of human body especially in terms of bone, muscles and adipose tissue.[1] Anthropometric studies have employed diverse techniques to measure and produce standard values for sketetal, dental and soft tissue structures for different human population.[2] Cephalometry is one of the important part of anthropometry in which dimensions of head and face are measured.[3] Bone morphology and structural cephalo-facial region follows specific developemental process and eventually being special and complex part of body.[4]

Craniofacial structures are the results of complex interaction of gene, environment and its additive effect.[3] Evidence shows a clear racial trend in the cranial dimensions and cephalic indices among different populations such as Indians, Turkman, Kosov & Albanians.[5]

Each part of body has a definite & proportional relationship with other part.[6] It is well established that a single standard of facial esthetics is not appropriate for application to diverse racial and ethenic groups. Therefore, researches on craniofacial study of different ethenic groups are ongoing with the intention to establish ethenic specific anthropometric data for populations with different ethnic background.[7,8,9] Hence this study was conducted to find out correlation of cephalofacial dimensions, to find out various cephalo-facial indices, to create standard baseline data on cephalofacial anthropometry in 600 Haryanvi adults and to compare present data with previous accessible data if available.

MATERIALS AND METHODS

The present study was conducted on 600 adult Haryanvi Banias (300 of either sex). Prior informed consent both in English & Vernacular were obtained from subjects in writing.

The subjects of age group 18 years to 40 years were included in the study. The subjects were apparently healthy and without any craniofacial deformity. Randomly selected from Haryana only

Methodology for cephalo-facial measurements was adopted from Anthropometry (Singh P & Bhasin MK).[10]

Exclusion Criteria

- Subjects of any physical deformities of head & face
- Subjects below 18 yrs & above 40 yrs

Somatometric Measurements

1. Maximum head breadth- It is the maximum biparietal diameter & is the distance between the most lateral points on the parietal bones

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2. Bizygomatic diameter- It is the straight distance between two zygia (zy). i.e. the most lateral points on the zygomatic bones
3. Bigonial breadth- It is the maximum breadth of lower jaw between two gonion points on the angles of mandible

Statistical Analysis

The data were analysed by statistical software. All the variables are expressed as frequency and percentages. All the data was entered into the SPSS version 16.0 and analysed. Level of significance was set at 95% confidence interval.

RESULTS

1. Jugo- mandibular index = $\frac{\text{Bigonial breadth x100}}{\text{Bizygomatic diameter}}$
2. Chervin's Transverse cephalo-facial index = BZD/MHB X100

Range- Variation for Jugo- Mandibular Index (According to Lundborg-Linders & Saller)

Range	Female	Male
Very Narrow	X-69.9	X-67.9
Narrow	70.0-74.9	68.0- 72.9
Medium	75.0-79.5	73.0-77.9
Broad	80.0-84.9	78.0-82.9
Very Broad	85.0- X	83- X

Table 1: Mean cephalo-facial measurements in males & females

Parameters	Sex			Range	
		Mean	S.D	Min	Max.
Bizygomatic Diameter	M	13.08	0.725	11.1	17.7
	F	12.35	0.759	10.4	14.6
Maximum head breadth	M	13.11	1.098	10.6	16
	F	12.95	0.832	10	14.7
Bigonial breadth	M	11.45	1.104	9.3	14.2
	F	10.33	0.753	8.4	12.4

Table 2: Comparison of JMI (JUGO MANDIBULAR INDEX) of present study with previous studies.

Study	JMI (males)	JMI (females)	Subject
Das P et al,[12]	98.57 (M)	96.11(F)	On 300 Bangalee Hindus (WB)
	98.18(S)	92.95(D)	
Singh NT et al,[13]	69.9	67.9	1000 Meitei popn of Manipur
Sangvichien S et al,[14]	71.56	71.20	On 101Thai skulls
Present study	87.53	83.64	600 Haryanvi Banias

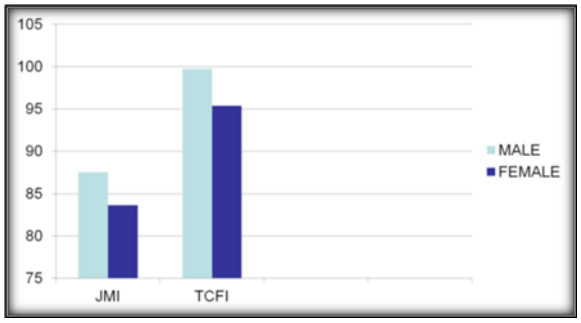

Figure 1: Mean Jugo-mandibular index (JMI) & Chervin's Transverse cephalo-facial index (TCF).

Mean JMI in males was 87.53 and in females 83.64 while mean, Chervin's transverse cephalo- facial index was 97.77 in males & 95.36 in females.

DISCUSSION

Anthropometric characteristics have direct relationship with sex, shape and form of an individual and these factors are intimately linked with each other and are manifestation of the internal structure and tissue components which in turn, are influenced by environmental and genetic factors.[11]

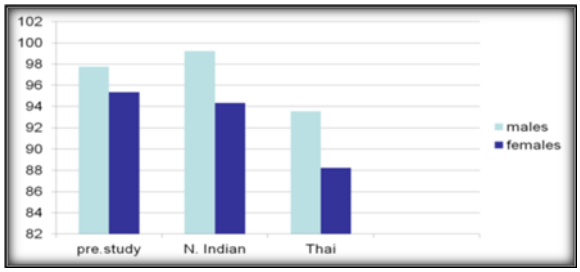

Figure 2: Comparison of transverse cephalo-facial index (TCFI) of present study with other studies

In present study, the mean values of all measurements used in present study are significantly higher in males than females. The mean bizygomatic diameter in males was 13.08 and in females was 12.35. The mean bigonial diameter was 11.45cm in males and 10.33 cm in females. Similarly, the mean head breadth was 13.11cm in males and 12.95 cm in females. These parameters are supported by above mentioned studies. Jugo-mandibular index was more in present study than other studies (both in males and females except Das P et al,[7] study). JMI (Jugo-mandibular index) range variation, in present study was very broad type, both in males (87.53) & in females (83.64) respectlvely. (As per Lund-Berg-Linders & Saller classification).

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Which was in agreement with Bangalee Hindu (98.57 in males & 96.11 in females). In Metei population of Manipur valley and Thai Skulls have very narrow to narrow type of Jugomandibular index respectively.

- Mean Bigonial breadth was 11.45 cm in males and 10.33cm in females.
- Mean bizygomatic diameter was 13.08 cm in males and 12.35cm in females.
- Mean maximum head breadth was 13.11cm in males and12.95cm in females.
- All Cephalo- facial measurements were more in males then females
- Mean Jugo-Mandibular index was 87.53 in males and 83.64 in females i.e. Very Broad type both in males & females

Chervin's transverse cephalo-facial index was 97.77 in males and 95.36 in females which were higher than thai skulls (93.55 in males, 88.23 in females) but lower than Saini V et al,[15] study on North Indian population, in males (99.24).

CONCLUSION

On the basis of above findings it was concluded that the mean value of bigonial diameter was 11.45 cm in males & 10.33 cm in females and bizygomatic diameter was 13.08 cm in males & 12.35 cm in females. The maximum head breadth was 13.11cm in males and 12.95cm in females. The mean jugo-mandibular index was 87.53 in males & 83.64 in females. Mean transverse facial index was 97.77 in males and 95.36 in females. i.e all measurements were more in males as compared to the females. The data for the present study can be used in various branches of sciences like forensic sciences, plastic surgery and bioarchaeology to make estimations of biological profile and these cephalo- facial measurements can also useful in making of different equipment such as goggles, headphones, helmets, etc. and also in medical lines for accidental surgeries etc.

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