



“Study of Cephalic Index in Rural area of Lucknow region”

Anatomy

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ABSTRACT

Background: Variety of metric and non-metric measurements assess the ethnic and sex differences of skull. The non-ethnic measurements are more subjective, and the actual measurements like cephalic indices provide a metric recording of size, proportions of cranial features. Cephalic indices play a crucial role in comparison of cephalic morphometry between parents, offspring and siblings and provide information on inheritance pattern.

Material & Methods: The present study was performed on 100 participants of rural area of Lucknow region and anthropometric points were measured by using spreading, sliding calliper.

Result: The present study showed the head of most of the participants were mesocephalic.

Conclusion: In the present study most of the crania in both sexes were mesocephalic.

KEYWORDS:

Cranial index, Cephalometry, Anthropometric points,

INTRODUCTION

Morphology of all living being undergo changes in varying degrees during their life and the features are variable in the individuals of the same species.¹ Human population is different is measurable character. Cephalic indices play a crucial role in comparison of cephalic morphometry between parents, offspring's and siblings and provide information on inheritance pattern.² Anthropometry evolved as a standard scientific technique for measuring human body dimensions.³ Cranial capacities are affected by ecological, geographical, racial, gender and age factors.^{4,5} Physical anthropology plays an important role in forensic sciences. It also provides important contributions like age and sex determination of individuals. Physical anthropology also contributes an important role in the fields of dermatoglyphics, serology, osteology, osteometry.⁶⁻⁸

MATERIAL AND METHODS

The study was conducted in the Department of Anatomy, TSM Medical College & Hospital, Lucknow. Sample size was 100 participants of rural area of Lucknow region including both males and females. The participants who volunteered in the study were healthy and without any obvious craniofacial abnormalities and had no history of plastic or reconstructive surgery. Participants was properly informed about the present study and written consent were taken. All the measurements were taken with the subject sitting in chair, in relaxed condition and head in anatomical position (Frankfurt's plane). Hrdlicka's method was used for assessing the cephalic index using Glabella, Inion and Euryon as anatomical landmark for measuring cephalic length and breadth.

Glabella: A point above the nasal root between the eyebrows and intersected by mid-sagittal plane.

Inion: The distal most point placed on the external occipital protuberance in the mid-sagittal plane.

Euryon: The lateral most point placed on the side of the head.

The cephalic index was determined on the basis of international anatomical descriptive.⁹

S.N.	Skull Shape	Cephalic Index
1	Dolicocephalic	70-74.9
2	Mesocephalic	75.0 -79.9
3	Brachicephalic	80.0-84.9

4	Hyperbrachicephalic	85.0 -89.9
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Cephalic Index = Head Width/ Head Length x 100

The results are based on the data obtained from 100 participants.

RESULT

In the present study cephalic index was calculated using the standard formulae and determined on the basis of international descriptions. Hrdlicka's method used for the Assessing Cephalic index.⁹ All measurements were expressed in centimetres. The data represents the mean and standard deviation of the actual values of head length, head breadth and cephalic index of all subjects. The results were computed and analysed statistically as shown in Table 1 and 2.

Table 1: Range of Head length and Breadth

No. of cases	Head Length	No. of cases	Head Breadth
7	16.01 – 17.00	6	11.01 – 12.00
13	17.01 – 18.00	3	12.01 – 13.00
37	18.01 – 19.00	21	13.01 – 14.00
32	19.01 – 20.00	52	14.01 – 15.00
11	20.01 – 21.00	15	15.01 – 16.00
-	-	3	16.01 – 17.00

Table 2: Distribution of head shapes

Age	Dolicocephalic	Mesocephalic	Brachicephalic
17-18	10	10	5
19-20	11	7	7
21-22	5	21	3
22	3	12	6

DISCUSSION

Cephalometry is an important tool for an anthropologist as well as for forensic expert for identification of differences in race, sexual and also for identifying the comparison of changes between parents, offspring and siblings. It also helps in identification of genetic transmission of inherited characteristics and to a great extent for the facial reconstruction of disputed identity. The cephalic index is one of the important cephalometric indices. In present study we observed that the mean cephalic index in both sexes were ranging from 75.0-79.9, hence the head shapes could be classified as mesocephalic as the commonest head shape. Stewart's classified Punjabi subjects as brachicephalic or Hyperbrachicephalic.¹⁰ A study conducted by Kondo et al revealed that, the head breadth will reach maximum at the age of 14 and head length will increase even after the age of 14.¹¹

An Indian study revealed that cranial index in Indian population was 76.98 (mesocephalic) for Bhils and 79.80 (mesocephalic) for Barelās.¹² Another study revealed that cranial index of Gujaratis is 80.816.¹³ It is crystal clear from the above statistics, the sex as well as race of the deceased can be determined accurately with the measurement of head. This is an important tool for anthropologists and forensic science experts. Interaction of gene expression, and cranial dimensions can make the gene expression differs in various racial, and ethnic groups in geographical zones.¹⁴ The first generation of Hawaii immigrants had higher cephalic index than their parents. It is very interesting to know that cephalic indices vary significantly among the population in different geographical zones.

CONCLUSION

In the present study most of the crania in both sexes were mesocephalic. More studies are necessary to determine the role of environmental, gene and racial factors on the shapes of the head and face.

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