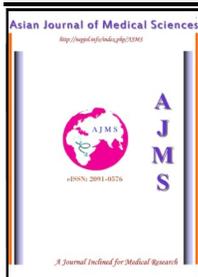# ASIAN JOURNAL OF MEDICAL SCIENCES

The Study Of Cephalic Index Of Andhra Region (India)

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Abstract

Objective: The cephalic index is the ratio of the maximum breadth of head to its maximum length. Cephalic index is very useful anthropologically to find out racial difference. It has also been reported that cephalic index is less than 2-3 in individual with sickle cell anemia than normal individual.

Material & Methods: The present study was carried out with 320 (160 male & 160 female) medical students of Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation and Dr. Sudha & Nageswara Institute of Dental Sciences Chinnaoutpally, Krishna District (AP), INDIA.

Results: The mean cephalic index was 76.94±2.53. The mean cephalic index for male was 75.68±2.05 and for female was 78.20±2.33. The difference between male and female cephalic index was significant (p= 0.001 & difference 2.52).

Conclusion: The result of present study shows that majority of male of Andhra region are dolicocephalic or mesocephalic and female are mesocephalic. Cephalic index of the female is 2-3 point higher than the male in Andhra region population. This study will serve as basis of comparison for future studies on Andhra region population.

Key Words: Cephalic index; head length; head breadth; Andhra region of India

1. Introduction

The cephalic index is the ratio of the maximum breadth of head to its maximum length. Cephalic index is very useful anthropologically to find out racial difference.[1] It can also be utilized to find out sexual differences.[2] Comparison of changes in cephalic index between parents, offspring and siblings can give a clue to genetic transmission of inherited characters.[1]

By means of cephalic index; person can be classified into following three groups[1,2]:

1. Dolicocephalic: cephalic index below 76 for male & 77 for female.

2. Mesocephalic: cephalic index between 76-81 for male & 77-82 for female.

3. Brachycephalic: cephalic index above 81 for male & 82 for female.

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Dolicocephalic person have otitis media less often than brachycephalic person.[3] It has been reported that individual with Apert's syndrome are hyperbrachycephalic.[4] It has also been reported that cephalic index is less than 2-3 (difference of 2.7) in individual with sickle cell anemia than normal individual.[5] Small head with varying cephalic index is found in Cohen syndrome.[6] Pathological cephalic index may indicate chromosome anomaly.[7] Standardized cephalometric records enable diagnostic comparison between patients and normal population.[8] The cephalometric results can be of assistance when evaluating a patient before craniofacial surgery.[9]

Few reports exist on the cephalic index of Andhra region or Andhra Pradesh of India. Hence we under took this study to document the cephalometric characteristics and sexual differences in cephalic index of Andhra region of India.

2. Material and Methods

The present study was carried out with 320 (160 male & 160 female) medical students of Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research

Foundation and Dr.Sudha & Nageswara Institute of Dental Sciences Chinnaoutpally, Krishna District (AP), INDIA. Medical students were selected because of the easy availability. Only students belonging to Andhra region were selected for present study. They belong to age group of 20-25 years. This study got Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation   ethical committee permission.

The anatomical landmarks, glabella (g), inion (I) and euryon (eu) were marked. The anatomical landmarks were defined as follows:

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

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

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

All the measurements were taken with subjects sitting on the chair; head in anatomical position. The each measurement was taken to the nearest 1 mm. The head length was measured with spreading caliper with scale from glabella to Inion. Head breadth was measured as the maximum transverse diameter between the two euryons using spreading caliper with scale. The process of measurements was explained to each and every subject. The written consent obtained from each and every subject before taking measurements. Cephalic index was calculated as maximum breadth of head / head length X 100. The subjects were classified into dolicocephalic, mesocephalic and brachycephalic.

Data analysis: The data was entered into the computer and analyzed using NCSS statistical package. The differences in means of cephalic index, head length and head breadth were tested for statistical significance by independent sample "t" test.

3. Results

From the collected data, statistics were analyzed and observations and results are presented in tabulated form (Table no: 1, 2 &3). The minimum cephalic index was found to be 69.11 and maximum cephalic index was found to be 84.52. The mean cephalic index was 76.94±2.53. The mean cephalic index for male was 75.68±2.05 and for female is78.20±2.33. The difference between male and female heads cephalic index was significant (p= 0.001 & difference 2.52).

The mean head length was 177.75±7.32 mm. In the male the head length varies from 173 mm to 203 mm, the mean head length being 182.25±6.04 mm. In the female the head length varies from 163 mm to 191 mm, the mean head length being172.68±4.40 mm. The difference between male and female head length was significant (p= 0.001 & difference 10.15 mm).

Table-1: Showing statistics of various parameters of present study

Variable	n	Min.	Max.	Mean	S.D.	S.E.	P Value
Cephalic index (male)	160	69.11	79.33	75.68	2.05	0.162	= 0.001
Cephalic index (female)	160	71.67	84.52	78.20	2.33	0.184	= 0.001
Cephalic index (male &female)	320	69.11	84.52	76.94	2.53	0.141	---------
Head length of male (mm)	160	173	203	182.83	6.04	0.477	= 0.001
Head length of female (mm)	160	163	191	172.68	4.40	0.348	= 0.001
Head length of male & female (mm)	320	163	203	177.75	7.32	0.409	---------
Head length of male (mm)	160	132	144	138.25	2.44	0.193	= 0.001
Head length of female (mm)	160	128	143	138.25	3.50	0.277	= 0.001
Head length of male & female (mm)	320	128	144	136.61	3.43	0.192	---------

Table-2: Showing classification of subjects based on cephalic index

Sex	n	Dolico-cephalic	Meso-cephalic	Brachy-cephalic	Total
Male	160	80	80	00	160
Female	160	55	93	12	160
Total	320	135	173	12	320

Table-3: Showing distribution of head length of male & female

Range of cephalic index	Male	Female	Total
160-170 mm	00	30	30
170-180 mm	57	116	173
180-190 mm	71	13	84
190-200 mm	31	01	32
200-210 mm	01	00	01
Total	160	160	320

The mean head breadth was 136.61±3.43 mm. In the male the head breadth varies from 132 mm to 144 mm, the mean head breadth being 138.25±2.44 mm. In the female the head breadth varies from 128 mm to 143 mm, the mean head breadth being 134.98±3.50 mm.

4. Discussion

Gender and racial variation in the cranium were recorded by Williams et al (1995) Shah G. V. and Jadhav H.R, studied 500 (302 males & 198 females) medical

students of Gujarat In their study the mean cephalic index is 80.81. The mean cephalic index for male was 80.42 and for female was 81.20. Most of their subject belongs to mesocephalic group. The mean head length for male is 18.26 cm and for female is 16.5 cm.[1]

Mahajan A et al studied 400 medical students of Punjab aged 17-23 years. The mean cephalic index for male was 81.34 and for female was 85.75. The difference between the mean cephalic index of male and female of Punjab was statistically significant. Punjabi community can be categorized as brachycephalic.[10]

Lobo S. W. et al studied 267 (157 males & 110 females) subjects of Gurung village, Nepal. The mean cephalic index for male was 83.10±6.08 and for female was 84.60±5.14. Most of their subject belongs to brachycephalic group. The mean head length for male is 18.0±0.85 cm and for female is 17.4±0.78 cm.[11]

According to Bhasin M. K., the value of cephalic index is quite high among the population of Andhra Pradesh (77.79). The value of cephalic index for scheduled tribes is 74.21; and varies from 69.44 to 78.90. The value of cephalic index for scheduled caste is 76.50; for caste 76.98 and for community 76.89 in Andhra Pradesh and South India.[12]

In our study the mean cephalic index is 76.94 which are slightly lower than the mean cephalic index of Bhasin M. K for Andhra Pradesh. But in our study; we never recorded caste of students (subjects). These students belong to caste, community, scheduled caste, scheduled tribes etc. This may be the reason for the difference between the mean cephalic index of our study and the mean cephalic index of Bhasin M. K for Andhra Pradesh. But our results were almost nearer to that of Bhasin M. K.

5. Conclusion

The result of present study shows that majority of male of Andhra region are dolicocephalic (80 out 160) or mesocephalic (80 out 160) and female are mesocephalic(93 out 160). There was a significant difference (p= 0.001 & difference 2.52) between cephalic index of male and female heads of Andhra region. Thus we can conclude that cephalic index of the female is 2-3 point higher than the male in Andhra region population. The head length of male ranges between 170 mm – 200 mm and females 160 mm – 190 mm. Only 1 out of 160 female subjects has head length more than 190 mm. No male subject has head length less than 170 mm. Thus we conclude that female of Andhra region hardly had head length more than 190 mm. Male of

Andhra region hardly had head length less than 170 mm. This data can be useful for forensic medicine experts, plastic surgeons, anatomist, anthropologist, oral surgeons and for clinical and research purpose. This study will serve as basis of comparison for future studies on Andhra region population.

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