



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2018; 7(5): 467-469

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www.thepharmajournal.com

Received: 04-03-2018

Accepted: 05-04-2018

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The variation of head shapes in 18-25 years male students of district Jhalawar (Rajasthan) India

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Abstract

Cephalic index and head shape are affected by geographical, gender, age and racial factors. This study carried out to determine cephalic index and head shape in male students of age group between 18 to 25 years of Jhalawar district Rajasthan State. This descriptive study was done on 100 of male students of age group between 18 to 25 years of Jhalawar district Rajasthan State.

Mean and SD of cephalic index was 74.07 ± 2.316 . The head shape of 60% of individuals was dolichocephalic, 39% mesocephalic, 1% brachycephalic. Native individuals showed typical dolichocephalic. In comparing to other studies in world, we can conclude that the role of racial/ethnic factor in cephalic diameters.

Keywords: Cephalic index, head-length, head-breadth, anthropometry, dolichocephalic, head shape male

Introduction

Anthropology uses many parameters that can be measure and compared with various subjects. The cephalic index was defined by Swedish professor of Anatomy Anders Retzius (1796–1860) and first used in physical anthropology to classify ancient human remains found in Europe^[1]. The measures used by Retzius - when applied to living individuals — are known as cephalic index, and when referring to dry skulls, cranial index^[2, 3].

Human body dimensions are affected by ecological, geographical, racial, gender, and age factor^[4]. Cranium ranks the most classical, most studied and informative subjects of examination^[5]. Cephalometry is grain to the morphological study of all the structures present in a human head^[6].

Cephalic index is calculated as Maximum head breadth / Maximum head length x 100.^[7] On basis of cephalic index head shapes classified four international categories Doliocephalic (CI up to 74.9), Mesocephalic (CI 75-79.9) Brachiocephalic (CI 80- 84.9), Hyperbrachiocephalic (CI > 85)^[8]

This study provides a data base of cephalic index measurements useful for forensic medicine, plastic surgery, orofacial surgeons in craniofacial reconstruction. By noticing, the effect of age, gender and geographical factors on head dimensions and no documented research in this area, for the first time, this study was done to determine the cephalic index and types of head shapes in 18-25 years old native male in Jhalawar district of Rajasthan. Also, compare this study with other similar studies.

Material and Methods

The present study was conducted on 100 males students selected as subject. College students was selected because of the easy availability. The age of the range was 18-25 years. The study was conducted on the Govt. PG College Jhalawar (Raj.). The method was used for assessing the cephalic index is Hrdlicka's Method^[9]. Measurements which have been taken are, head width & head length. All the measurements were taken with spreading calliper.

Cephalic Index = Head Width/ Head Length x100

Head Breath: Maximum Horizontal Diameter

Head Length: Glabella to Inion

All the measurement was taken with the subject sitting in the chair in the relaxed condition and head in the anatomical position.

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Results

Mean and SD of cephalic index in male students of age group between 18 to 25 years of Jhalawar district Rajasthan State (Table 1) was 74.07±2.316. The mean cephalic index for students age between 18 to 25 years male is 74.07±2.316 (S.E. 0.231) (Table 3). The morphological classification of the head was done according to the cephalic index. Among all male students age between 18 to 25 years, the dominant type was dolichocephalic with a frequency of 60%, Mesocephalic 39 %and the rare type was brachycephalic with frequency of 1% (Table 4). This difference was statistically significant (p= 0.393) using student t-test from SPSS software. Table 4

shows comparison of cephalic index from different studies.

Table 1: Age distribution

Age in years	Number (n=100)	Percentage (%)
18	12	12%
19	14	14%
20	14	14%
21	26	26%
22	13	13%
23	7	7%
24	4	4%
25	10	10%

Table 2: Cephalic index of the study subjects

Cephalic index (cm)	Male	Total (%)	Cephalic index (cm)	Male	Total (%)
69.01 to 70	1	1 (1%)	76.01 to 77	7	7 (7%)
70.01 to 71	8	8 (8%)	77.01 to 78	9	9 (9%)
71.01 to 72	13	13 (13%)	78.01 to 79	3	3 (3%)
72.01 to 73	16	16 (16%)	79.01 to 80	2	2 (2%)
73.01 to 74	13	13 (13%)	80.01 to 81	1	1 (1%)
74.01 to 75	14	14 (14%)	Total	100	100 (100%)
75.01 to 76	14	14 (14%)			

Table 3: Analysis of males students of age group between 18 to 25 years cephalic index variable

Sr. No.	Male	
1.	No. of Case	100
2.	Cephalic Index Range (cm)	69.39-80
3.	Mean(cm)	74.07
4.	S.D.	2.316
5.	S.E.	.231

Table 4: Result from head shape classification for the male students of age group between 18 to 25 years

Head Shape	Number	(%)
Dolichocephalic	60	60
Mesocephalic	39	39
Brachycephalic	1	1
Hyperbrachycephalic	0	0

Table 5: Comparison of cephalic index (Mean) with other population

S. No.	People / Country	Reserch workers	Mean Cephalic Index
1.	Bhils of central India	Bhargava & Kher, 1960	76.98
2.	Berelas of central India	Bhargava & Kher, 1961	79.80
3.	Gujrati Students	Shah & Jadhav, 2004	80.81
4.	Igbo male	Oladipo and Olotu, 2006	79.04
5.	Medical students of Panjab	Anupama <i>et al</i> , 2009	85.53
6.	Ogbia, Niegria	Eroje <i>et al</i> , 2010	72.96
7.	Srilankan males	Ilayperuma I, 2011	78.04
8.	Indians students(Males)	Yagain VK <i>et al</i> , 2012	77.92
9.	Haryanvi Baniyas(Males)	Mahesh Kumar <i>et al</i> , 2012	66.72
10.	Student of Jhalawar district, Rajasthan (Male)	Present Study, 2013	74.07

Discussion

Present study showed that the mean cephalic index of male students of age group between 18 to 25 years of Jhalawar district Rajasthan was mean 74.07.

Cephalic index from the present study higher than Eroje *et al*, 2010 study in Ogbia, Niegria with 72.96, [16] Mahesh Kumar *et al*, 2012 study in Haryanvi Baniyas (Males) with 66.72. [4]

Cephalic index from the present study was lower than Bhargava & Kher, 1960 study in Bhils of central India with 76.98, [10] Bhargava & Kher, 1961 study in Berelas of central India with 79.80, [11] Shah & Jadhav, 2004 study in Gujrati Students with 80.42, [12] Oladipo and Olotu, 2006 study in Igbo male with 79.04, [13] Anupama *et al*, 2009 study in Medical students of Panjab with 85.53. [6] Ilayperuma I, 2011 study in Srilankan males with 78.04, [14] Yagain VK *et al*, 2012 study in Indians students (Males) with 77.92. [15] In our study, dominant type of head shape was dolichocephalic (60%) Mesocephalic (39%) and rare Brachycephalic (1%).

Conclusion

The mean cephalic index in males was 74.07. So student of Jhalawar district (Rajasthan), Male showed predominance of Dolichocephalic, 60% (males) and and Mesocephalic phenotype was 39% in males and Brachycephalic phenotype was 1% in males. In conclusion, this study shows a significant increase of dolichocephalic and mesocephalic and a significant decrease of brachycephalic and hyperbrachycephalic head shape in male. Our results suggest a continuity of debrachycephalization process The data of present study can be used in various branches of sciences like forensic sciences, plastic surgery and oral surgery.

Abbreviation: CI – Cephalic Index

Acknowledgments

The author and co-authors acknowledge the support and assistant given by the Department of Anatomy, Jhalawar Medical College Jhalawar (Raj.) India. The participants of

Govt. PG College Jhalawar (Raj.) and other individuals to ensure the successful completion of this study.

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