

Cephalic Index in Population of District Jhalawar, Rajasthan According to Food Habit and it's Significance

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ABSTRACT

Background: Cephalic index exhibits sexual differences and different shapes of head. This information will be highly important for Plastic surgeons, Forensic Scientists, Anatomists, Human Biologists, Criminologists & Physical Anthropologists.

Materials & Methods: The present study was observed on 200 living subjects of Jhalawar district Rajasthan (100 male and 100 female) of 18 to 25 years in the year of 2013 with the objective to study the sex differences and food habitual in cephalic index. Cephalic index was investigated with the help of head length and width with the use of spreading caliper.

Results: The study showed that mean cephalic index was higher in females than in males.

Conclusion: Predominant head type was dolicocephalic in both sexes.

Key words: cephalic index, dolicocephalic, vegetarian, non-vegetarian

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INTRODUCTION

Anthropometry is a technique of measuring the human body in terms of dimensions, proportions, and ratio such as those provided by cephalic index for determining various head. Cephalic index is the most frequently investigated craniofacial parameters as it utilizes the length and breadth of the head which are useful indices in the study of secular trend^[1,2] Body dimension are affected by ecological, biological, geographical, racial, gender and age factors as quoted by Imami.^[3] Lifestyle, nutrition, intercaste marriage, environment, geographical variation and ethnic composition of population lead to change in body dimension and require regular updating of anthropometric data. Ever since the human life came to existence, constant changes are occurring in morphological appearance.^[4] Cephalic index is calculated as Maximum head breadth / Maximum head

length x 100.^[5] 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).^[6]


We in our study include Jhalawar region which is one of the biggest parts of Rajasthan. As no research, has been conducted in this area, we tried to establish and compare Cephalic Index of 18 to 25 years age of students of Jhalawar district (Rajasthan) with available data of various Indian populations. This study useful for Plastic surgeons, Forensic Scientists, Anatomists, Human Biologists, Criminologists & Physical Anthropologists.

METHODS

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This descriptive and cross sectional research was done on 200 students (100 Males and 100 Females). Students were selected because of the easy availability. The age of the students ranged from 18 to 25 years. The study was conducted on the Govt. PG College and Govt. Girls PG college Jhalawar (Raj.). All the measurements were taken with the subject sitting in chair, in relaxed condition and head in anatomical position. The method used for assessing the cephalic index is Hrdlicka's method.^[7]

The head length from glabella to inion will measure with the help of spreading caliper. The head breadth will measure as the maximum transverse diameter between two fixed point. Cephalic Index = Head Width/ Head Length x100

RESULTS

A total 200 adults were studied out of which 100 (50%) were male and 100 (50%) were female. The male subject was divided into out of 100; vegetarian male – 57 (57%) and non-vegetarian male-43(43%), and female subject were divided into out of 100; vegetarian female-83 (83%) and non-vegetarian female-17 (17%). The study subjects were aged between 18 years to 25 years and Mean Cephalic Index was 74.23(SD=2.68; p=0.393). For Males, Mean Cephalic Index for Male was 74.07(SD=2.31; p=0.617). For Females, Mean Cephalic Index for Female was 74.39(SD=3.00; p=0.568). For Vegetarian Males Mean Cephalic Index was 73.73 (SD=.604). For Non-vegetarian Males Mean Cephalic Index for Non-vegetarian males was 74.20 -(SD=2.34). For Vegetarian males, Cephalic Index for Vegetarian females was 74.31 (SD= 3.091). For Non-vegetarian Females, Mean Cephalic Index for Non-vegetarian females was 74.77 (SD=2.581). Collected data of present study was statistically analysed. The observations and results are presented in the tabular form.

Table 1: Cephalic index of the study subjects according to gender

Cephalic index (cm)	Male			Female			
	M	F	Total (%)	M	F	Total (%)	
68.01 to 69	0	3	3 (1.5%)	14	8	22 (11%)	
69.01 to 70	1	1	2 (2%)	7	14	21 (10.5%)	
70.01 to 71	8	6	14 (7%)	9	6	15 (7.5%)	
71.01 to 72	13	16	29 (14.5%)	3	12	15 (7.5%)	
72.01 to 73	16	11	27 (13.5%)	2	2	4 (2%)	
73.01 to 74	13	8	21 (10.5%)	1	1	1 (0.5%)	
74.01 to 75	14	12	26 (13%)	Total	100	100	200 (100%)

M= Male, F= Female

Table 2: Comparative analysis of males and females cephalic index variable:-

Sr. No.		Male	Female
1.	No. of Case	100	100
2.	Cephalic Index Range (cm)	69.39-80	62.92- 80.11
3.	Mean	74.07	74.39
4.	S.D.	2.316	3.009

Table 3: Comparative analysis of Vegetarian males and Non-vegetarian males cephalic index variable

Sr. No.		Veg. Male	Nonveg. Male
1.	No. of Case	57	43
2.	Cephalic Index Range (cm)	69.39- 79.16	70.27- 80
3.	Mean	73.97	74.20
4.	S.D.	2.312	2.341

Table 4: Comparative analysis of Vegetarian females and Non-vegetarian females cephalic index variable

Sr. No.		Veg. female	Nonveg. female
1.	No. of Case	83	17
2.	Cephalic Index Range (cm)	62.92-80.11	71.03-78.44
3.	Mean	74.31	74.77
4.	S.D.	3.097	2.581

Table 5: Comparative analysis of Vegetarian females and Non-vegetarian females cephalic index variable

Variable in (cm)	N	Min. (cm)	Max. (cm)	Mean (cm)	S.D.	S.E.	P value
Cephalic index (male)	100	69.39	80	74.07	2.316	.231	
Cephalic index (female)	100	62.92	80.11	74.39	3.009	.300	
Cephalic index (male and female)	200	62.92	80.11	74.23	2.683	.189	0.393
Cephalic index (Veg. male)	57	69.39	80	73.97	2.31	.306	
Cephalic index (Nonveg. male)	43	70.27	78.21	74.20	2.34	.357	
Cephalic index (Veg. male and Nonveg. male)	100	69.39	80	74.07	2.31	.231	0.617
Cephalic index (Veg. female)	83	62.92	80.11	74.31	3.091	.340	
Cephalic index (Nonveg. female)	17	71.03	78.28	74.77	2.581	.626	
Cephalic index (Veg. female and Nonveg. Female)	100	62.92	80.11	74.39	3.00	.300	0.568

Table 6: Result from head shape classification for the male and female in percentage (%) based on cephalic index.

Head Shape	Male (%)	Female (%)
Dolichocephalic	60	56
Mesocephalic	39	33
Brachycephalic	1	1
Hyper brachycephalic	0	0

Table 7: Comparison of cephalic index (Mean) with other population

Sr. No.	People / Country	Research workers	Cephalic Index
1.	Bhils of central India (7)	Bhargava & Kher, 1960	76.98
2.	Berelas of central India (8)	Bhargava & Kher, 1961	79.80
3.	Gujrati Students (9)	Shah & Jadhav, 2004	80.81
4.	Medical students of Panjab (10)	Anupama et al, 2009	85.53
5.	Gujrati Population (11)	Jadav et al, 2011	80.20
6.	North Indian Popn (Males) (12)	Anitha et al, 2011	79.14
6.	North Indian Popn (Females)		80.74
7.	Indians students (Males) (13)	Yogain VK et al, 2012	77.92
7.	Indians students (Females)		80.85
8.	Haryanvi Baniyas (Males) (14)		66.72
8.	Haryanvi Baniyas (Females)	Mahesh Kumar et al, 2012	72.25
9.	Student of Jhalawar, Rajasthan (Male)		74.07
9.	Student of Jhalawar, Rajasthan (Females)	Present Study, 2013	74.39

DISCUSSION

The variations in cephalic indices between and within population have been attributed to a complex interaction between genetics and environmental factors. In present study the mean cephalic index in males was 74.07 and in females 74.39. So the dominant type of head shape in male was dolichocephalic (60%) and in female was 56%. The findings of dolichocephalic was similar to study done on (Anitha et al, 2011)^[4] North Indians in which 40.6 % was dolichocephalic and 15.6% was hyperdolichocephalic but

the percentage was more than this study & the mean cephalic index is more in previous study. North and central Indian population have Dolichocephalic predominance (Singh & Bhasin, 2006). This is in agreement with the present study.

In our study, dominant type of head shape in males was dolicocephalic (60%) and mesocephalic (39%) and the mean cephalic index was 74.07 (dolicocephalic). This finding of dolicocephalic was similar to study done on Indian males (Bhatia *et al.*, 1995) in which 58.5% of population was dolicocephalic, but not similar with the study by Shah & Jadhav^[9] in Gujarati (41%) which showed Mesocephalic head shape was common. The dolicocephalic shape was a rare type found in 7% in Indian Gujarati (Shah & Jadhav).^[9]

The similar studies were conducted in different groups and Cephalic index was found to be different for different groups due to genetics and geographical factors. The value of mean cephalic index (males & females) in present study is lower as compared to other study however Bhils of central India, Haryanvi population have value close.^[14]

CONCLUSION

The result of present study showed that all male and female of Jhalawar region students of age group of 18 years to 25 years of colleges of Jhalawar District (Rajasthan) are Dolichocephalic according to classification based on cephalic index.

There was a significant difference ($p < 0.393$ & difference 0.32) between cephalic index of male and female of Jhalawar region. Thus, we can conclude that cephalic index of the female is some point higher than the male in Jhalawar region population.

There was a significant difference ($p < 0.617$ & difference 0.23) between cephalic index of Vegetarian male and Non-vegetarian male of Jhalawa region. Thus, we can conclude that cephalic index of the Non-vegetarian male is 0.23point higher than the Vegetarian male in Jhalawar region population.

There was a significant difference ($p < 0.568$ & difference 1.8) between cephalic index of Vegetarian female and Non-

vegetarian female of Jhalawar region. Thus, we can conclude that cephalic index of the Non-vegetarian female is 1.8 point higher than the Vegetarian female in Jhalawar region population.

ABBREVIATION – CI – Cephalic Index

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