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*Original Research Article.*

# Correlation between Cephalic and Facial Index in Medical Students at a Tertiary Care Teaching Centre

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## ABSTRACT

**Background:** Human facial contour has always been an interesting subject for anatomists, anthropologists, plastic surgeons, artists and also the identification of an individual's race is an essential component. Comparison of changes in cephalic and facial index can give a clue to genetic transmission of inherited characters and diagnosis of genetic and acquired anomalies for the study of normal and abnormal growth.

**Materials & Methods:** Correlative type of study was done in Anatomy department of J.L.N. Medical College, Ajmer performed on 200 students (100 Males and 100 females) aged 16-25 years. Parameters were taken for the calculation of cephalic and facial index.

**Result & Conclusion:** From the study it was concluded that the mean facial index in males is 94.29 and females is 91.89 whereas the cephalic index is 79.04 in males and 77.89 in females.

**Keywords:** Anthropometry, Cephalic Index, Facial Index.

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## INTRODUCTION

Geometrical variability not only helps to understand the variations in the bodily measurements in various populations but also make the data base available to help automate the process of various features with computer based animation technologies.[1,2]

The cephalometric and facial analysis is the diagnostic tool which can provide specific and important information about the facial disharmonies which is critical for the follow up of the patients. Accurate facial analysis such as facial height, facial width and facial index is essential for diagnosis of genetic and acquired anomalies for the study of normal and abnormal growth and for morphometric investigations. Facial index may be an important factor in increasing susceptibility to obstructive sleep apnea.[3,4] Facial index is used in anthropometry to describe the facial proportion. Facial type assessment is crucial for the planning and prognosis of orthodontic treatments. Facial pattern indicates the direction of growth of craniofacial complex.[5,6]

Cephalic indices play a crucial role in comparison of cephalic morphometry between parents, offspring and sibling and provide information on inheritance pattern. On the basis of calculations of cephalic index the races can be classified as Hyperdolicocephalic (65.5-69.9), Dolicocephalic (70.0-74.9), Mesocephalic (75-79.9) Brachycephalic (80.0-84.9), Hyperbrachycephalic (85.0-89.9) and Ultrabrachycephalic (> 90.0) similar is for facial index and the faces are classified as Hypereuryproscpic (<79.9), Euryprospic (80.0-84.9), Mesoprospic (85.0-89.9), Leptoprospic (90.0-94.9) and Hyperleptoprospic (>95.0).[7,8]

## MATERIALS & METHODS

The study was conducted in Department of Anatomy, J.L.N. Medical College, Ajmer including 200 subjects (100 males and 100 females).

The participants who volunteered in the study were healthy and without any obvious craniofacial abnormalities. The age group was 17-24 years. All measurements were taken with subject sitting in relax straight position. Cephalic index is calculated by determining the ratio between maximum width and length of head. Facial index is classified as ratio of nasimental length and bizygomatic width.

All the data were analysed using MS excel and SPSS. Mean and standard deviation were calculated.

**Table 1: Cephalic Index**

| Cephalic Index | Type of face | No. of cases | |
|---|---|---|---|
| | | Male | Female |
| 65.5-69.9 | Hyperdolicocephalic | 8 | 3 |
| 70.0-74.9 | Dolicocephalic (lower headed) | 27 | 20 |
| 75-79.9 | Mesocephalic( medium headed | 53 | 47 |
| 80-84.9 | Brachycephalic(short headed) | 2 | 24 |
| 85-89.9 | HyperBrachycephalic | 10 | 6 |
| -More than 90.0 | UltraBrachycephalic | - | - |

**Table 2: Facial Index**

| Facial Index | Type of face | No. of cases | |
|---|---|---|---|
| | | Male | Female |
| <79.9 | Hypereuryprospic | 3 | 5 |
| 80.0-84.9 | Euryprospic | 20 | 18 |
| 85-89.9 | Mesoprospic | 23 | 34 |
| 90-94.9 | Leptoprospic | 37 | 31 |
| >95.0 | Hyperleptoprospic | 17 | 12 |

## RESULTS & DISCUSSION

The parameters are useful for plastic surgeons during treatment of congenital and traumatic deformities, identification of individuals in medicolegal cases by forensic scientists and identifying craniofacial deformities of genetic syndromes by geneticist.

According to a study on facial index of Haryani adult by Mahesh Kumar et al. (2013) concluded that the Facial index was 86.09 in male and 84.84 in female. So all the measurements were more in males as compared to females. It was concluded that the dominant type of face shape in males was mesoproscopic (49.66 %) followed by euriprosopic (24%), leptoprosopic (12.33%), Hypereuriprosopic (11%) & Hyperleptoprosopic (3%). In females the dominant type of face was also mesoprosopic (35%) followed by Hypereuriprosopic (25%), euriprosopic (19.33%), leptoprosopic (19%) and hyperleptoprosopic (1.66%).

In the present study both subjects of male and female were studied. Out of 100 males 53% were having Mesaticephalic head with Leptoproscopic face having values of 79.04 and 94.29 respectively while the females had 47 %. Mesaticephalic head (77.89) and face index as 91.89 showing that males have a higher values of cephalic and facial index than females.

Present study also showed a similar results by a study which was conducted by k Lakshmi Kumar et. al (2015) 170 male and 110 female adults were studied. In male 3.5% are dolichocephalic, 31.42% are mesocephalic, 23.57% are brachycephalic and 6% are hyperbrachycephalic. In female cephalic index brachycephalic heads shows highest percentage as 26.4%, mesocephalic heads are 10%, hyperbrachycephalic heads are 2.1% and lowest percentage is dolichocephalic. With the cephalic index sex as well as race of an individual can be determined. Comparison of cephalic index between parents and offsprings can give a clue to genetic inheritance. Facial index in male shows mesoprosopic with 20.4%, euryprosopic with 21%, leptoprosopic 10% and hyperleptoprosopic and hypereuryprosopic with less percentage. In females most of them are euryprosopic and 7% leptoprosopics. Facial index is crucial for orthodontic treatment. Both indices are important in anthropometry, forensic medicine and genetics.

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