Variations in total facial index among students of Kathmandu University School of Medical Sciences

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ABSTRACT

The total facial index exhibits sexual differences and different shapes of face. Facial anthropometry has its well known implications for forensic scientists, anatomists, human biologists, criminologists and physical anthropologists. Facial index is the ratio of the morphological facial height to facial width and multiplied by 100. The present study aimed to examine the facial length, facial width, facial index and to find out the facial type in students of Kathmandu University School of Medical Sciences. The present study was conducted on 300 medical, dental and human biology students of Kathmandu University School of Medical Sciences, Dhulikhel, Nepal. Of the total 300 students 150 students were male and 150 students were female and were between the age group 18-25 years. The study had been approved by the Institutional review committee of Kathmandu University School of Medical Sciences, Dhulikhel, Nepal. The study result showed that the mean facial index of Nepalese students was 87.01. The mean facial index of Nepalese male was found to be 87.20 and female was found to be 86.81. The dominant facial type in students of Kathmandu University School of Medical Sciences was found to be mesoproscopic and least common was hyperleptoproscopic. The dominant facial type in male was euriproscopic and the dominant type in female face was mesoproscopic.

Keywords: Facial index, facial height, facial width, anthropometry, mesoproscopic, euriproscopic

INTRODUCTION

Facial anthropometry provides an indication of the variations in facial shape in a population and it characterize the distinctive features of a likely face in that population.[1] Face is an entity that allows us to distinguish one person from another. It also permits distinctions between races, ethnic groups, sexes and even members of the same family.[2] Measurements and evaluations of human body are carried out by physical anthropometry. Anthropometry of the face has always been an interesting subject for artists and plastic surgeons. Since ancient times, many rules have been proposed for the ideal face.[3] Anthropometric measurements are important for its various uses in identifying a missing person, determining a criminal, finding out a person in any accidental cases like road traffic accident, burn, drowning, natural disaster, plane crash etc. These measurements are essentially used in the treatment of reconstructive and plastic surgery due to congenital and post-traumatic deformity.[4]

The science of anthropometry has been utilized in diverse fields including anatomy, paleoanthropology, forensic sciences, cancer Research, reconstructive and cosmetic surgery.[5, 6] Anthropometric characteristics have direct relationship with sex, shape and form of an individual and these factors are intimately linked with each other and are manifestation of the internal structure and tissue components which in turn, are influenced by environmental and genetic factors.[4]

The face is the most important and interesting area of the body in many respects.[7] When we look at a person we look upon the face first. The facial variations always help us to differentiate the different ethnic people. The facial dimensions have got special interest in the different medical disciplines and artistry.[8] Facial analysis is the first step in the evaluation of patients who present for cosmetic or reconstructive procedure of the face.[9] The most important facial dimensions are height and width (bizygomatic distance) of face that determine the total facial index. The total facial index is calculated as maximum facial height/maximum facial width X 100.[10] Based on facial index; the types of faces can be classified into following five groups according to Banister's classification.[11]

1. Hypereuriproscopic (very broad face): facial index less than 80.

2. Euriproscopic (broad face): facial index between 80 – 85.

3. Mesoproscopic (round face): facial index between 85 – 90.

4. Leptoproscopic (long face): facial index between 90 – 95.

5. Hyperleptoproscopic (very long face): facial index more than 95.

MATERIALS AND METHODS

The present study was conducted on 300 medical, dental and human biology students of Kathmandu University School of Medical Sciences, Dhulikhel, Nepal. Of the total 300 students 150 students were male and 150 students were female between the age group 18-25 years. The study has been approved by the Institutional review committee of Kathmandu University School of Medical Sciences, Nepal. All the measurements were taken with subjects sitting on the chair and head in Frankfort plane. Measurements which had been taken were; facial height and facial width by using a sliding caliper. Facial height was taken from nasion (point on the root of the nose where the mid-saggital plane cuts the nasofrontal sutures) to gnathion(lowest point on the mandible where the lower margin of the lower jaw is intersected by the mid-saggital plane). Facial width was taken from zygion of right and left side. Facial index was calculated using the following formula.

Facial index = Face length/Face width 100

Based on Banister's classification, the subjects were grouped into hypereuriproscopic, euriproscopic, mesoproscopic, leptoproscopic and hyperleptoproscopic.

RESULTS

From the collected data, statistical analysis was performed and results are presented below in the tabulated form. The study results showed that the mean facial index of students was 87.01. The mean facial index of male was found to be 87.20 and female was found to be 86.81. The minimum facial index was 71.72 and maximum facial index was 124.59 as a whole. The minimum facial index for male was found to be 74.10 and maximum facial index for male was found to be 124.59 respectively. The minimum facial index of female was 71.72 and maximum facial index of female was 98.26. There was no significant difference on mean facial index between male and female (p = 0.553).

The mean facial length of male was 112.35 mm and the female was 112.7 mm. There was no significant difference between mean facial length of male and female (p = 0.637). The mean facial width of male was 129.16mm and the female was 130.17mm. There was no significant difference between mean facial width of

male and female (p = 0.310). (Table no. 1 and Table no.2)

Table 1 : Table showing facial length, facial breadth and facial index in students of Kathmandu University School of Medical Sciences

N=300

	Age	Facial length	Facial Breadth	Facial Index
Mean	21.37	112.5300	129.6667	87.0101
Median	21.00	113.0000	130.0000	86.4000
Mode	21	115.00	130.00	83.33
Std. Deviation	1.573	6.47473	8.62342	5.63305
Minimum	18	97.00	107.00	71.72
Maximum	25	152.00	152.00	124.59

Table 2 : Table showing facial length, facial breadth and facial index of male and female students of Kathmandu University School of Medical Sciences

N=300

Gender		Age	Facial length	Facial Breadth	Facial Index
Male	Mean	21.13	112.3533	129.1600	87.2036
	Median	21.00	112.0000	129.0000	86.1097
	Mode	20	115.00	124.00	83.33
	Std. Deviation	1.648	7.17952	8.08767	6.37428
	Minimum	18	99.00	112.00	74.10
	Maximum	25	152.00	152.00	124.59
Female	Mean	21.61	112.7067	130.1733	86.8167
	Median	21.00	113.0000	130.0000	86.6169
	Mode	21	115.00	130.00	83.33
	Std. Deviation	1.460	5.70240	9.12681	4.79256
	Minimum	18	97.00	107.00	71.72
	Maximum	25	124.00	148.00	98.26

The dominant facial type of Nepalese population was observed to be mesoproscopic and least common was hyperleptoproscopic. The dominant facial type of male was euriproscopic and the dominant type of female face was mesoproscopic. The rare type of face was hyperleptoproscopic. (Figure no.1,2 & 3)
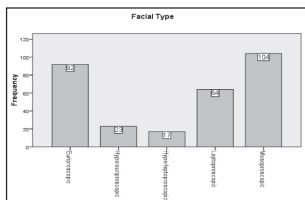

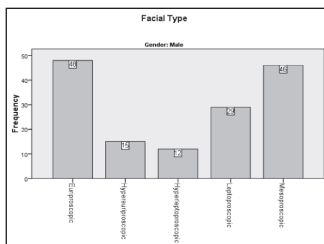**Fig. 1:** Facial type frequency on total study sample (300)
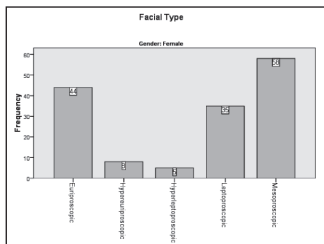
Fig. 2: Male facial type frequency

Fig. 3 : Female facial type frequency

DISCUSSION

The present study reported the anthropometrical variations in facial index of students by measuring morphological facial height, facial width and calculating facial index. All measurements were expressed in millimeters. The facial dimensions were expressed by facial index which is ratio of facial length to facial breadth and multiplied by 100. The present study revealed that the mean facial index of Nepalese students was 87.01 and the mean facial index of male students was 87.20 and the mean facial index of female students was 86.81. There was no significant difference on mean facial index between male and female (p = 0.553).

Shetti V reported the mean facial index for males and females as 87.19 and 86.75 respectively in medical students of Melaka Manipal Medical College, Manipal. The minimum facial indexes in both sexes were 75.75 and maximum facial index of males and females were 96.66 and 100 respectively. The difference that was observed between two groups was statistically significant (p=0.018). The dominant face type in Malaysian males were euriproscopic and female belonged to

mesoproscopic.[12] In the present study the dominant facial type of male was euriproscopic and the dominant facial type of female was mesoproscopic which is similar to the finding of Shetti V.

Study conducted by Shah S et al on normal undergraduate medical students of Nepalese origin from BP Koirala Institute of Health Sciences (BPKIHS), Nepal found that the face form of males were mesoproscopic and of females were leptoproscopic. They showed the comparison of all measured parameters with geographical differences. In the present study,the dominant facial type of male was euriproscopic and the dominant facial type of female was mesoproscopic and the students included were from different ethnic and geographical variations and the measurements are affected by ecological, biological, geographical, racial, gender, age related and nutritional factors. [13]

In a study of native Fars and Turkman ethnic groups the dominant type of face shape in both native Fars and Turkman males were mesoproscopic and the dominant type of face type in both native Fars and Turkman females were euriproscopic. The mean facial index of Turkman males and females were 87.25 and 81.48 respectively.[14] The mean facial index of Fars males and females were 88.22 and 84.48 respectively which remained closely similar to the present findings. In present study we found the dominant type of face in male students was euriproscopic and the dominant facial type of female as mesoproscopic, which is quite opposite in their study.

In a study of Bhasin M.K, Indians dominant facial type was mesoproscopic which was similar to our present study showed that Nepalese dominant facial type was mesoproscopic. [15]

Singla M et al studied the facial index in adult Indian Punjabi males jat Sikhs and banias. They reported the dominant type of face shape in Jat, Sikhs males was euriproscopic which was similar to our present study. They also reported the dominant type of face shape in Bania males was hypereuriproscopic.[2]

Uttekar K et al studied the variation in facial index of Gujarati males. The study results showed that the mean facial index of Gujarati males were 81.7 which is lesser than the findings of present study. The dominant type of male face was euriproscopic and rare type of face was leptoproscopic and hyperleptoproscopic,Manipal. which is similar to the findings of present study as the Nepalese male students dominant face type was euriproscopic and the rare face type was hyperleptoproscopic. [16]

In a study by Salve V et al reported the dominant type of face shape in males of Andhra region was mesoproscopic

whereas dominant type of face shape in females were euriproscopic which is opposite to the findings of present study as student's dominant face type in males was euriproscopic and the dominant face type of female was mesoproscopic. [17]

The present study revealed that the mean facial index of students was 87.01 and the predominant face type was mesoproscopic. The dominant facial type of male was euriproscopic and the dominant facial type of female was mesoproscopic. This study had been conducted on 300 students which is the limitation of this study. Hence, in the future when conducting similar studies a larger sample size is recommended. This type of study is important in medical applications such as cosmetology and would be useful to orthodontists, plastic surgeons, anatomists, maxillo-facial surgeons and anthropologists. This study will serve as base line information for future studies on Nepalese medical students.

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