A Study of facial indices among young Malay adults

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Abstract-Facial analysis is useful anthropologically to identify the racial, ethnical and sexual differences. The present study was done to see the sex difference and variation of facial index among the adults Malay. Cross sectional descriptive type of study was done in Anatomy department in UniKl RCMP which was performed on 81 Malay adults (40 male, 41 female) aged 19-40 years. To measured the morphological parameters (facial height, facial width and facial index) digital slide calliper and scale were used .There were significant differences found in all facial parameters of male compared with the female. The mean morphological facial height was 111.9 ±8.4 and morphological facial width was 127.3 ±8.0.The mean facial index was 90.85±8.38 for male and 85.86±5.69 for female. The total facial index was calculated according to the formula and the results obtained were analyzed statistically using the t-test which was statistically significant (0.003). The dominant phenotype in Malay population was mesoprosopic or round face (45%) and least common face type was Hyperleptoprosopic or very long face (5%). There were significant variations in the face index between Malay male and female, further study with large samples size in different races in Malaysia is recommended.

Keywords*: *Facial height, facial width, facial index, Sex

I. INTRODUCTION

Two persons are never alike in their measurable characters[1] and hence study of intra and interpopulation variations among different morphological characters has long been an interest of the anthropologist[2,3].Anthropometry constitutes the technique of expressing quantitatively the form of the body [4].Sexual dimorphism refers to phenotypic characteristics that differ between males and females of the same species [5] and for evaluation of this variations it should be established for a particular population [6].The comparison of the changes in facial index between parents, offspring and sibling can give the clue to genetic transmission of inherited characters [7,8]. Human facial contour has always been an interesting subject for anatomist, anthropologist, plastic surgeons and artists and also the identification of an individual's race is an essential component in forensic identification and reconstruction [7]. 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 such as euryproscopic facial type favors the nasal breathing mode [8]It clearly indicates that there is research vacuum in facial height, facial width and facial index that's why it demands more studies.

II. MATERIAL AND METHOD

In this study, 81 Malay people were taken as subject out of these 40 males and 41 females, age range 19-40years in a normal healthy state. Study carried out with protocol presentation and followed by ethical committee clearance. Tresna digital slide caliper series: EC05 (ID: 111-103-20g), scale read up to 300mm was used for measurement. The subjects were informed about the study design, its benefits and confidentiality of the data collected. Written consent was taken from each subject. Subjects were asked to sit in a relaxed state, straight and looked forward. The morphological facial height was measured with digital slide caliper with scale from nasion (n) to gnathion (gn). Face width was measured as the straight distance between the right and left zygion (zy-zy). The anatomical landmarks were defined as follows:

Nasion (n): The point on the root of the nose where the midsagital plane cuts the nasofrontal sutures.

Gnathion (gn): The lowest point of mandible where the lower margin of the lower jaw is intersected by the midsagital plane.

Zygion (zy): It is the most lateral placed point on the zygomatic arch.

$$\text{Prosopic index (PI)} = \frac{\text{Facial height}}{\text{Facial width}} \times 100$$

Statistical analyses were done by descriptive statistics and Student (Independent) t test. All the statistical analyses were done by using the SPSS 17.0 version.

The above index was determined on the basis of international anatomical descriptions. Based on this index, the types of face shapes were categorized according to Banister's classification-

Face Shape	Range of Prosopic index
1.Hypereuriprosopic-(very broad face) (HEP)	<79.9
2.Euriprosopic -(broad face) (EP)	80-84.9
3.Mesoprosopic- (round face) (MP)	85-89.9
4.Leptoprosopic -(long face) (LP)	90-94.
5.Hyperleptoprosopic-(very long face) (HLP)	>95

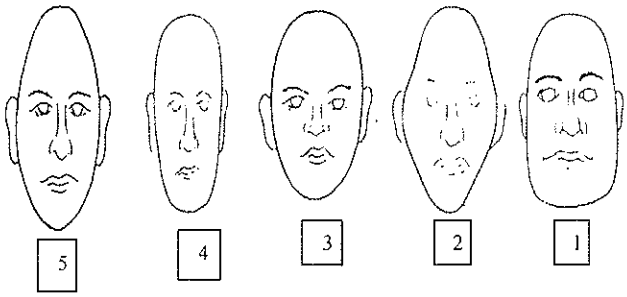


Fig.1 Illustration shows the different types of face shapes (Jahanshahi M et al 2008.).

III.RESULT

The finding of study is depicted in table I, II and table III. In general, female showed the minimal measurement as compared to male in both variables. The mean of female facial height was 107.00 ±8.4 but in male it was 117.7 ± 7.99.The mean facial width was 129.9±7.7 and 125.0 ±7.5 in male and female respectively. The facial height of combined male and female was lower than the facial width in Malay population.

Table I: Mean and SD of FH and FW of Malay male and female.

Sex(n)	FH (mm) Mean ± SD	Range of FH (mm)	FW (mm) Mean ± SD	Range of FW(mm)
Male	117.4 ±7.998	98.54-130.8	129.9±7.711	115.6-149.2
Female	107.0±8.4	94.6 -120.9	125.00±7.51	112.7-140.66
Combine	111.9 ±8.4		127.3 ±8.0	

In table II among Malay male the range of facial index was 67.44-106.90 but for female it was 75.21-97.99.The mean±SD of facial index of male and female were 90.85±8.38 and 85.86±5.69 respectively. There was a highly significant (0.003) difference in the mean value of facial index between male and female.

Table II: Mean and SD of facial index of Malay male and female.

Sex(n)	Range of facial index	Facial index Mean ± SD	P value
Male	67.44-106.90	90.85±8.38	*0.003****
Female	75.21-97.99	85.86±5.69	

In table III the result showed that the dominants type of facial shape for Malaysian male and female was mesoprosopic(Round face), which was 50% and 39% for male and female respectively. The second commonest type of facial shape for female was Euriprosopic (broad face) which was 24% but for male it was Leptoprosopic (Long face) which was 20%. Least common facial shape was Hyper Leptoprosopic (Very long face) and it were 5% for both sexes.

Fig1: Morphological variation of Facial index in Female.

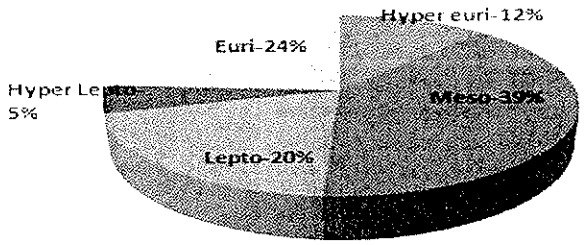
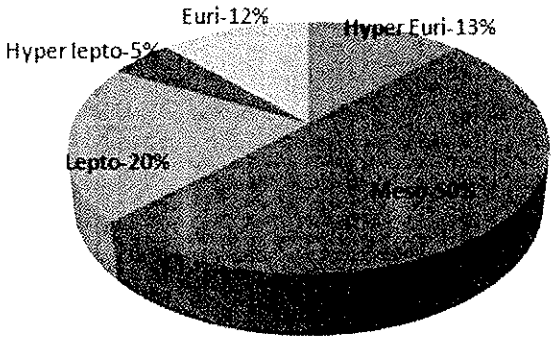


Table III: Distribution of Face type in Malaysian male and female.

Sex(n)	*HEP <80*	*EP 80-85*	*MP 85-90*	*LP 90-95*	*HLP >95*
Male	5	5	20	8	2
Female	5	10	16	8	2
Total	10	15	36	16	4
%	12%	18%	45%	20%	5%

Fig2: Morphological variation of facial index in male



IV: Discussion:

This present study showed that the range of morphological facial height for Malay female was 94.6-120.9mm and in Malay male was 98.54-130.8mm. Range of morphological facial width was 115.6-149.2mm and 112.7-140.66mm for female and male respectively. And in general all female value showed lesser than that of the male. Vaishali R at el (2011), Omotoso et al (2012)[2,5] had done the similar study in Malay population, showed that all female values were lesser than male, and the mean value was also similar to the present study which was 111.9±8.4 (Height) and 127.3±8.0 (width). Ngeow W C et al who was done a similar study in Malaysian students at Melaka Manipal medical college, but the width of the face was greater than the male value (Male-132.5±7.0 and female 140.1±4.9) which was not similar to the present study [3]. Osunwoke et al (2011), Chisom Eliakimet al (2012) had done studies on Nigerian and Chinese population on sexual dimorphism. Their results were similar to the present study, this may be due to that the male hormone

female it was euriprosopic type, but in our study dominant type of face for the Malay was mesoprosopic and euriprosopic type of face was the second common one for Malay female. This similarity may be due to which may be due to similarity environmental condition [10]. On the other hand Praveen Kumar et al (2013) had done a study in south Indian population, and found that the dominant face type was Hyperleptoprosopic, which was the least common type in Malays (5%) [7]. Jeremic et al (2013) study done in central Serbia showed the similar result of sexual dimorphism which was significant as like the present study, but the dominant face type was Leptoprosopic followed by mesoprosopic which was not same to our study[9].

V: Conclusion

The mean Facial index of Malay population has been identified. There are significant difference present in facial index between the male and female(p-0.003) The predominant face type for Malay population is mesoprosopic(50% for male and 39% for female). The second common type of face for male is Leptoprosopic (20%) but for female it is Euriprosopic (24%) and the least common face type for Malay is Hyperleptoprosopic (5%).

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