Anthropometric Study on the Prosopic Index of Adult Ogoni Tribe

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Abstract
This prospective study is aimed at determining the prosopic index of adults from Ogoni. Comparing the prosopic index of males and females, and also comparing the mean prosopic index of Ogoni adults to that of other ethnic groups in Nigeria. A total of 400 volunteer subjects were used for the study (200 males and 200 females). Subjects were purely from Ogoni. Their age ranged from 15-30 years. Their maximum facial length and maximum facial width were measured using a venier caliper and prosopic index calculated by dividing the maximum facial length by maximum facial width and multiplying the result by 100. Theresult showed that the mean prosopic index of Ogonifemale is 80.27 and that of Ogoni is 71.31. Using the z-test to compare the two means, there was a significant difference between the mean of prosopic index of Ogoni males and that of Ogoni females (p<0.05). Theprosopic index of Ogoni males fall under the theeuryprosopic group and the Ogoni females fall under the hypereuryprosopicgroup. This study is therefore recommended in anthropological studies.

INTRODUCTION

Forensic anthropology plays a vital role not only in identification, sex and age but also in identification of skeleton. Cephalometry is an important branch of anthropology which involves measurement of the head and face, the facial (prosopic) dimension is an important cephalometric parameter which is used to describe gender and racial differences. Human body dimension are affected by ecological, biological, geographical, racial, gender, age and nutritional factors (Golalipour et al., 2003; Rajiakshni et al., 2001; Radovic et al., 2000; Tuli et al., 1995; Okupe et al.,1984;). Based on this factors, age, sex and ethnic group in certain geographical zone are given due consideration in antropometric studies (William et al., 1995; Golalipour, 2006 Del sol, 2005) the facial index is the length of the face from the roof of the nose to the bottom of the chin, expressed as a percentage of the greatest breadth across the check bone.

Conducting anthropometrical studies with the aim of obtaining the characteristics of ethnical group inhabiting a particular geographical region, not only assist in understanding the frequency distribution of human morphologies but also in providing the basis for a comparison among different face (Heidari et al., 2004; Golipour et al 3003, 2001a,b; Everekliogu et al., 2002) the prosopic index classifies individual into hypereuryprsopic (very broad face) europrosopic (broad face), mesoprosopic (round face), leptoprosopic (long face), hyperleprosopic (very long face) based upon the ratio of the length of the face to the facial width (Heidari et al., 2001; Jahanshahi et al., 2008). Variation in facial types is encountered in every population. Studies indicate ethic variations in the face type among individual (Raji et al., 2010; 2008).

Ghosh et al., (2007) found facial index of Santhals of West Bengal to be nypereuroprosopic and europrosopic.Bhasin (2009) found facial index in North India 82.33, in West India 84.52, in East India 86.27, in Central India 87.45 and in South India 86.61. Nego et al, (2009) found facial index to be 85.5 amongst Malaysian student. Raji et al (2010) found index 95.86 in Nigerian Population.

Viashali et al (2011) reported in the research title 'study of prosopic (facial) of Indian and Malaysian students' that the facial morphology of male and female Indian and Malaysian inhabitants belonged to mesoprosopic face type. Chamdimal et al., (2012) also reported that the dominant type of facial shape in Purana male and female belonged to leptoprosopic and the least common type was hypereuryprosopic in both male and female. Chandimal et al., (2012) reported that the facial morphology of male and female Purana inhabitants begin leptoprosopic differs from the reported facial morphology of Indian male as mesoprosopic and female as mesoprosopic (Valshali et al., (2011).

The aim of this study is to determine the prosopic index of Ogoni people, that is, to know which group the Ogoni adults fall into (e.g hypereuryprosopic, euryprosopic, mesoprosopic, leptoprosopic, or hyperleptoprosopic).

MATERIALS AND METHODS

This study was carried out among the people of Ogoni tribe in Rivers State within a period of four months. A total number of 400 subject, between the ages of 15-35 years, was recruited for this study; all subjects were indigenes of Ogoni tribe. 200 subjects were males and while 200 subjects females.

All measurement (i.e the facial lengths and facial breadths) were taken with the subject sitting in a

relaxed condition a head in anatomic position. Once the subject had achieved the physiological rest position, nasion and gnathion were identified. Nasion was marked as the deepest part of the midline depression justbelow the level of the eyebrows (Wilkie, 1979). Gnathion was marked as the most inferior midline point on the mandible (Fawehinmi et al., 2010). Facial length measurement was made between nasion to gnathion and recorded in millimeters using a vernier caliper. Whereas Facial breadth was recorded as the distance between the zygomatic arches using vernier caliper.

All data were recorded in data sheets along with the prosopic index that were calculated for each subjects using the formula (Jahanshahi et al., 2008; Mane et al., 2010).

Prosopic index = $\underline{\text{Measurement facial length}}$ x 100

Maximum facial width

Statistical Analysis

Data collected from the measurements of prosopic indices for both male and female subjects of Ogoni were subjected to statistical analysis to show the measure of central tendency for the prosopic index of Ogoni subject. The data was analyzed using simplified statistical operations like: mean [X], standard deviation (S.D.), standard error (S.E.), and z-test were used as the tactical tools. The mean [X], is the sum of all the values of prosopic indices obtained divided by the number of cases. It is represented by the

Formula below

$$\bar{X} = \frac{\sum FX}{EF}$$

Where $\bar{X}$= means

$\sum$ =summation

$_x$= each of the value of prosopicindex (class midpoint)

F=frequency of occurrence

The mean can be used to calculate the deviation of each individual measurement. This is done by subtracting each value from the mean. Deviation of single measurement.

= X-$\bar{X}$= where $\bar{X}$= mean

X =class midpoint

Standard deviation (S.D.) is a measure of variation on dispersion and it measures the extent to which scores in a distribution, on the average, deviates from the mean.

The formula of standard deviation is:

$$S.D\sqrt{\sum \frac{f\,(x)^2}{n} \left(\frac{\sum fx}{n}\right)^2}$$

Where S.D. = standard deviation

$\sum$ =summation =

F = frequency

X = class midpoint

$\bar{X}$= mean

The standard error (S.E.) is Calculated by dividing the standard deviation by the squre root of the total number of the cases.

$$S.E. = \frac{S.D.}{\sqrt{n}}$$

z-testa statistical tool used in testing hypothesis. Z-test is to test foe significance between the two means for male and female volunteer subjects.

test for significance $= \frac{\bar{x}_1 - \bar{x}_2}{SE\,diff.}$

Where SE diff = standard error difference

$$= \sqrt{\frac{(SD_m)^2}{n_m} + \frac{(SD_f)^2}{n_f}}$$

And $\bar{x}_m$= mean of sample I

And $\bar{x}_f$= mean of sample II

RESULTS

The total of 400 volunteer subjects were measured, 200 were males while 200 werefemale, all from ogoni tribe. The mean prosopic index value was calculated for each and for both sexes combined.

Table 1: Showing female mean, SD, SE, Variance, min and max of Length (mm), WIDTH (mm), Prosopic index.

VARIABLE	N	MEAN	SE	SD	VAR	Minimum	Maximum
LENGTH	200	9.901	0.603	8.534	72.824	7.200	94.200
WIDTH	200	12.695	0.0305	0.431	0.186	11.540	13.570
PROSOPIC INDEX	200	71.31	0.439	6.215	38.631	54.900	85.200

Table 2: Showing Male mean, SD, SE, Variance, min and max of Length (mm), Width (mm), Prosopic Index.

VARIABLE	TOTAL COUNT	MEAN	STANDARD ERROR MEAN	STANDARD	VARIANCE	MINIMUM	MAXIMUM
LENGTH (mm)	200	10.998	0.0688	0.972	0.945	9.120	13.1330
WIDTH (mm)	200	13.708	0.0661	0.935	0.874	12.140	16.120
PROSOPIC INDEX	200	80.272	0.375	5.300	28.085	68.400	100.500
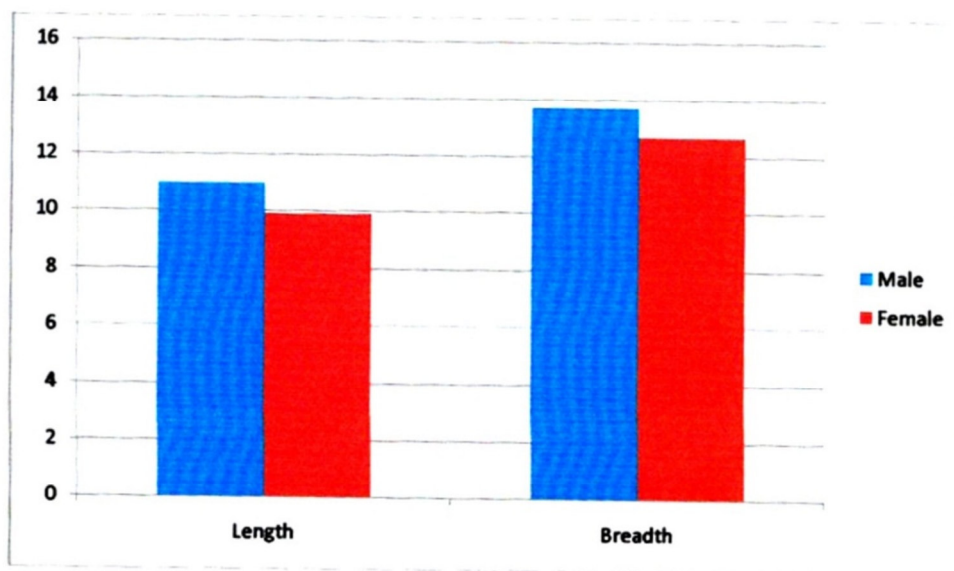
Figure 1: Bar Chart showing mean length and Breadth respective of male and female

Table 3: Showing male and female Mean, Length (mm), Breadth (mm), and Prosopic Index respectively.

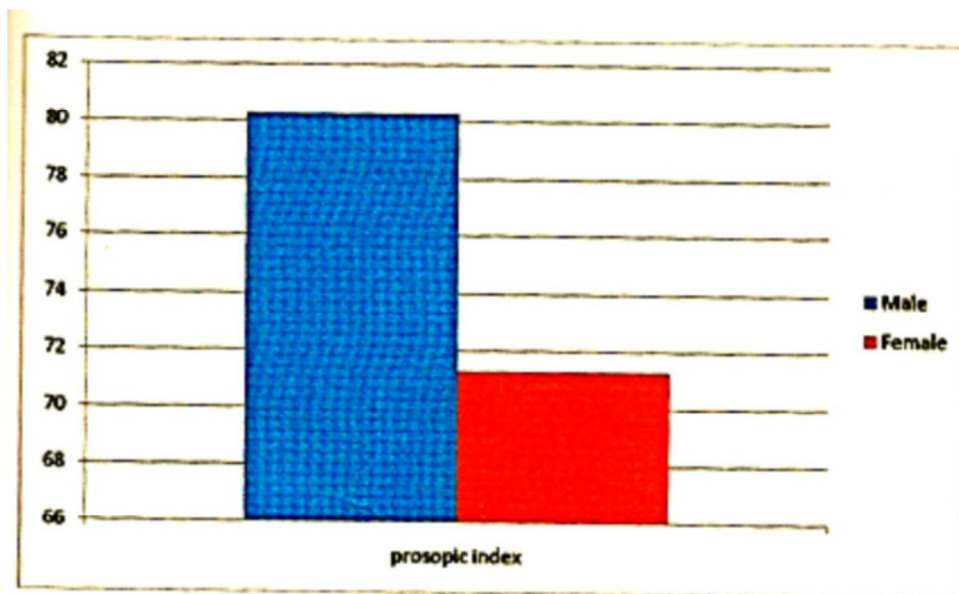| VARIABLE	TOTAL COUNT	MEAN	STANDARD ERROR MEAN	STANDARD	VARIANCE	MINIMUM	MAXIMUM
LENGTH (mm)	400	10.449	0.305	6.090	37.094	7.200	94.200
WIDTH (mm)	400	13.202	0.0443	0.887	0.786	11.540	16.120
PROSOPIC INDEX	400	75.793	0.365	7.307	53.393	54.900	100.500

Figure 2: Bar Chart showing prosopic index of male and females.

Table 4: Z-test result for comparison of the means of male and female samples.

PARAMETER	N	MEAN	STANDARD DEVIATION	Z-CALCULATED	Z-CRITIAL	INFERENCE
M-length	200	11.00	0.972	3.19	1.96	Significance
F-length	200	9.90	8.534			
M-width	200	13.71	0.935	2.46	1.96	Significance
F-width	200	12.69	0.431			
M-prosopic Index	200	80.27	5.300	2.74	1.96	Significance
F-prosopic Index	200	71.313	6.215			

From the table above z-calculated is more than z-tabulated, therefore Null hypothesis is rejected. The result is computed at a confident interval of 95%.

DISCUSSION

In this study, the anthropometric evaluation on the prosopic (facial) index of ogoni tribe was performed. The result of this study showed that male Ogonis have a facial index of 80.27 indicating euryprosopic categorization while female have a facial index of 71.31 making them hypereuryprosopic. The total mean prosopic indices in both the male and female Ogoni's place them in hypereuryprosopic group. This result of male and female Ogoni agrees with the work of Ghosh et al., 2007), who found facial index of Santhals of West Bengal to b eraeuryprosopic and euryprosopic, confirming that people of these facial shape exist. It also agrees with the work of Heidari et al., (2006), who reported that the dominant and rare face type among Sistanis were euryprosopic.

This result contradicts with the work of Raji et al., (2010) who reported facial index of North-eastern Nigerian population of adult males and female to be hyperleptoprosopic face group.

The variations in these populations can be attributed to a complete interaction between genetic and environmental factors as posited by Kasai et al., (1993). Moreover, ecological, biological, geographical, racial, gender and age factor have been reported to influence bodily dimensions (Okupe et al 1984; Tuli et al., 1995 Rajlaskmi et al., 2001 Golalipur et al., 2003).

CONCLUSION

The comparison between the male and female Ogoni tribe using prosopic index has distinctively shown sexual dimorphism which is an indication of genetic factor interference. This established fact can be useful in clinical facial reconstruction and racial identification.

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