

CRANIOFACIAL MEASUREMENTS OF THE LIP AND NOSE AMONG ADULT IGBO RESIDENTS OF MAIDUGURI

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Abstract

This study was designed to establish standard anthropometric values for the lip nose complex of Igbo's resident in Maiduguri. A total of 200 adults with no history of mixed racial-parentage consisting of 100 males and 100 females were assessed for the following nasal parameters (columella height, columella width, nasal width, dome height) and lip parameters (vertical height of the lip, Cupid's bow width and total width of the mouth). Columella height, columella width, nasal width and dome height in male subjects were 1.24 ± 0.23 , 0.57 ± 0.18 , 4.04 ± 0.55 and 2.89 ± 0.39 cm respectively while it was 1.18 ± 0.28 , 0.57 ± 0.13 , 3.80 ± 0.39 and 2.73 ± 0.44 cm respectively in the female subjects. Values obtained for the vertical height of the lip, Cupid's bow width and total width of the mouth in male subjects were 2.04 ± 0.46 , 1.49 ± 0.22 and 5.37 ± 0.52 cm while it was 2.09 ± 0.31 , 1.45 ± 0.29 and 5.14 ± 0.39 cm in the female subjects respectively. Male subject presented with a higher and significant ($P < 0.05$) values in nasal width, dome height and total width of the mouth than female subjects.

This study has established the anthropometric norms in the lip nose complex of Igbo's resident in Maiduguri with males demonstrating higher values than the female subjects.

Keywords: Lip-nose complex, Igbo's, Maiduguri, Columella, Cupid

I. Introduction

The lips have important functional and aesthetic roles in daily living and are the focal point of the lower face, with several aesthetic units intricately controlled by a complex series of muscles while the external nose on the other hand is pyramidal in structure and serve a cosmetic function by enhancing the personality and beauty of the individual, the nasal cavity act as a pathway of the respiratory tract where it filters and conditions the inspired air, it also serve as an organ of inspired air and as an organ for perception of smell (Harzrika *et al.*, 2007). The lip-nose complex comprises of the lip and the nose which have a significant effect on the esthetic feature of a person (Patnaik and Goel, 2010), character of a person (Riveiro *et al.*, 2003) and contributes greatly in forensic analysis (Khandekar *et al.*, 2005). Thus this study was designed to establish standard anthropometric values for the lip-nose complex of the Igbo's resident in Maiduguri.

II. Material And Method

Study Design: This study was conducted in Maiduguri; Borno state located in the North eastern region of Nigeria latitude $11^{\circ} 50' 42''$ North and longitude $13^{\circ} 9' 36''$ East. The study was conducted amongst volunteer Igbo people residing in Borno state. The study was carried out on 200 normal persons of Igbo

ethnic groups comprising of 100 males and 100 females aged between 18 - 35 years old. Subject who had trauma on the nose, any form of cleft lip or surgical scars on the lip and nose were excluded from the study.

Anthropometric measurements: Measurements were conducted on subject using standard anthropometric procedure with the subjects sitting in a chair in a relaxed condition and the head in anatomical position. The procedure of measuring the lip - nose complex was explained to each individual to eliminate anxiety on the part of the individual. The measurements were repeatedly taken for each individual to ensure accuracy. Seven measurements were taken from the lip and nose, evaluation of indices of the lip-nose complex was adapted from (Khandekar *et al.*, 2005).

- i. Vertical height of the lip: from the columella base to the cupid bow.
- ii. Cupid bow width: philtrum of the lip to another (peak to peak).
- iii. Total width of the mouth: Distance from one oral commissure to another.
- iv. Columella width: The portion between the nostrils.
- v. Columella height: Distance from the base of the nose to the point where the nostrils end.
- vi. Nasal width: Distance from one alar to another.
- vii. Dome Height: From the nasal base to the apex of the nose

Data Analysis

All measurements were carried out by a single investigator. Data obtained were recorded in a special form. The data was then subjected to statistical analysis using Statistical Package for Social Science (SPSS) software program (Version 11.0; SPSS Inc, Chicago, IL, USA) and results obtained were presented as mean $\pm$ S.D.

III. RESULTS

The result obtained following measurements of nasal and lip parameters in males and female Igbo are represented in Table 1. The results showed an average of 1.24 ± 0.23 , 0.57 ± 0.18 , 4.04 ± 0.55 and 2.89 ± 0.39 cm for columella height, columella width, nasal width and dome height respectively in male while the females presented with average values of 1.18 ± 0.28 , 0.57 ± 0.13 , 3.80 ± 0.39 and 2.73 ± 0.44 cm respectively. Measurements of lip parameters in male and female Igbo showed an average of 2.04 ± 0.46 , 1.49 ± 0.22 and 5.37 ± 0.52 cm in males and 2.09 ± 0.31 , 1.45 ± 0.29 and 5.14 ± 0.39 cm in females for vertical height of the lip, Cupid's bow width and total width of the mouth respectively. Comparison between the parameters obtained from the males with that of the females showed significant ($P < 0.05 - 0.001$) difference with the males having higher values in nasal width, dome height and total width of the mouth.

Table 1: Nasal and Lip Parameters in Igbo Males and Females

		Males N=100	Females N=100
Parameters measured (cm)			
Nasal	Columella height	1.24 ± 0.23	1.18 ± 0.28
	Columella width	0.57 ± 0.18	0.57 ± 0.13

	Nasal width	4.04 ± 0.55	3.80 ± 0.39***
	Dome height	2.89 ± 0.39	2.73 ± 0.44*
lip	Vertical height of the lip	2.04 ± 0.46	2.09 ± 0.31
	Cupid's bow width	1.49 ± 0.22	1.45 ± 0.29
	Total width of the mouth	5.37 ± 0.52	5.14 ± 0.39***

Significant values set at *P<0.05, **P<0.01, ***P<0.001.

IV. Discussion

The anthropometry of the lip-nose complex at various ages provides measurements that serve as guideline for orthodontic and surgical treatment. Facial rejuvenation procedure is known to have a major significance in cosmetic structure. The lip-nose complex plays an important role in the appearance of the young sexy lips and desired female face (Farkas and Kolar, 1987). It has been observed that despite the extensive use for neoclassic canons, clinicians found it was a mistake to use a single set of values and canon to try to achieve a prescribed result while neglecting facial variation, racial or ethnic background and the patient's personal preference. Data from several studies have shown great variety in facial, nasal, mouth size and the proportion among different ethnic groups. Hence, surgeons should take into account population specific factors when planning maxillofacial surgery.

Research has demonstrated that the nose width and the nose height become fully developed in females at the age of 12 and in males by the age of 14 or 15 (Farkas *et al.*, 1985 and Ferrario *et al.*, 1998). The size and curvature of the lips in various individual is subject to gender and ethnic variation, although it could also be altered by age to a small extent. The lip-nose complex after maturation, changes in measurement and this changes are minimal (Singh and Sidhu, 1986).

The lip-nose complex also contributes greatly in forensic analysis as facial reconstruction is an important factor required for the identification of skeletal remains especially the relationship between the bony skull and the nose. There has also been actual scientific study of many other features of the face. Some forensic anthropological studies have attempted to predict the position and size of the mouth and lips from skeletal remains and there appears to be a great deal of disagreement (Macho, 1986).

The columella height obtained from this study was greater than the values obtained in other studies carried out in other regions. The Han Chinese adult were 8.39 and 7.99 mm for males and females respectively (He *et al.*, 2009) while the Egyptian adult had 7.65 and 6.64 mm for the males and females respectively (ElHadidy *et al.*, 2007). The study carried out on the Indian population had a mean value of 9.8 and 8.6 mm for males and females respectively (Khandekar *et al.*, 2005). The adult Nigerians also showed a mean value of 13.9 and 13.7mm respectively (Garandawa *et al.*, 2009). Although the mean values were found to be higher in males, the difference was not statistically significant. Columella width in this study agrees with the work of Khandekar *et al.*, 2005 who had a mean value of 5.7 and 5.7 mm for male and female respectively but disagrees with other works whose average mean was 6.39 and 5.96 mm for males and females (He *et al.*, 2009) and a mean value of 9.6 and 9.5mm for male and female respectively (Garandawa *et al.*, 2009).

The values obtained as nasal width in this study was lower when compared with other studies carried out on other adult Nigerians whose mean values were 42.5 and 41.8 mm for males and females respectively (Garandawa *et al.*, 2009). Other study carried out are on the Han Chinese, which had a mean value of 39.30 and

34.75mm for the males and females respectively (He *et al.*, 2009), while Indian population had a mean value of 32.3 and 30.5mm for males and females respectively (Khandekar *et al.*, 2005). The dome height obtained in this study was higher in value than those obtained from a study carried out on an Indian population which was 20.4 and 16.9 mm for the males and females respectively (Khandekar *et al.*, 2005). The higher values obtained in the present study compared to results from other regions is attributed to the fact that narrower nose is being favoured in cold climate and broader nose in warm and moist environment as a consequence of natural selection of human evolution (Livhitis *et al.*, 1994). Other factors responsible for the variation in the parameters studied could be genetic, racial, tribal and environmental (Garandawa *et al.*, 2009). The values were higher in males than in female due to the large variation that exist in males and females as a result of the genetic make-up and as a result of sex differences arising from natural selection which has favoured males to be bigger than females (Darwin, 1871).

The parameters obtained from measurements carried out on the lips showed that the Cupid bow width and total width of the mouth was higher in males than in the females which is in agreements with similar studies in other regions (Khandekar *et al.*, 2005). The vertical height of the lip in the present study was higher when compared to other studies carried out on adults who had an average mean of 16.2 and 14.2 mm for male and female respectively (Khandekar *et al.*, 2005) while the cupid bow of the adult Indian was smaller when compared with that obtained from the present study whose mean was 11.7 and 11.8 mm for males and females respectively.

The total width of the mouth varied in values when compared to other results with the Asians having a mean value of 50.3 and 47.9 mm for males and females respectively (Wilkinson *et al.*, 2003) and the mean values for the north Indian was 46.79 and 43.86 mm (Patnaik and Goel, 2010).

The difference in lip measurement was suggested to be as a result of wide variation in the lip thickness and other factors such as pregnancy, age and ethnic origin may play equally determinant role in lip thickness as suggested (Geramov, 1991 and Angel, 1978).

V. Conclusion

This study has established the anthropometric norms in the lip nose complex of igbos resident in Maiduguri

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