

Anthropometric Study of Some Craniofacial Parameters: Head Circumference, Nasal Height, Nasal Width and Nasal Index of Adult Ijaws of Nigeria

¹G.S. Oladipo, ²P.D. Okoh and ¹J.S. Hart

¹Department of Human Anatomy, Faculty of Basic Medical Sciences,

²Department of Surgery, College of Health Sciences, University of Port Harcourt Teaching Hospital, Port Harcourt-Nigeria

Abstract: The aim of this study is to document the mean head circumference; nasal height; nasal width and nasal index of adult Ijaws of Nigeria and to provide a comprehensive data for use by anthropologists and medical practitioners. Craniofacial anthropometry is vital in making a precise and systematic measurement of human skull. A total of one thousand (1000) adults comprising 500 males and 500 females with age ranging from 18-65 years old were used for this study. All the subjects were drawn from Ijaw ethnic group in Bayelsa State. The results showed that the Ijaw male and female had mean head circumference of 57.49 and 56.25 cm respectively, mean nasal height of 4.08 and 3.89 cm respectively, mean nasal width of 4.06 and 3.79 cm respectively and mean nasal indices of 99.83 and 97.79 respectively. The z-test analysis indicates a sexual dimorphism, with significantly higher values of all the parameters in males compared to the females ($p < 0.05$). This study is therefore recommended to forensic anthropologists, craniofacial surgeons and medical practitioners and also serves as the basis for future studies on other Nigerian ethnic group.

Key words: Anthropology, head circumference, nasal height, nasal index, nasal width

INTRODUCTION

Anthropometry is concerned with measurement of physical sizes and shapes of human body. Craniofacial anthropometry is an integral part of craniofacial surgery and syndromology. It is a technique used in both physical and clinical anthropology comprising precise and systematic measurements of the bones of the human skull.

Craniofacial anthropometry also includes nasal height, nasal width, and nasal index. It is very important for the study of human growth and variation in different races and also for clinical diagnosis and treatment (Poswillo, 1963).

Oladipo *et al.* (2009c) reported that the nasal index of male Andonis and Okrikas were 79.83 and 86.23 respectively and female Andonis and Okrikas were 83.77 and 86.46 respectively. Another study was carried out by Franciscus and Long, (1991) in Onges. They reported that the mean nasal index for males fell between the ranges of 77.3-97.7 while those of females fell between the ranges of 70.5-97.4.

Oladipo *et al.* (2010) also reported the mean head circumference and mean nasal height of 53.60 and 3.99 cm respectively for Ijaw male children while those of female children were 53.00 and 3.88 cm respectively.

The aim of this study is to document the mean head circumference; nasal height; nasal width and nasal index of adult Ijaws of Bayelsa state of Nigeria which could be

of importance in clinical practice, forensic anthropology, genetics and paleoanthropological studies.

MATERIALS AND METHODS

The present study was carried out in Kolokuma/Opukuma and Nembe communities in Bayelsa State of Nigeria between April and December 2009. This study was carried out on adult Ijaws who were selected at random from the above named communities. A total of one thousand (1000) adults (18 to 65 years) comprising five hundred (500) males and five hundred (500) females were.

Subjects with craniofacial defects were not used. A non-stretchable tape was used for the measurement of head circumference while a sliding caliper for the measurement of nasal height and nasal width. The subject was seated comfortably on a chair with his/her head at the same level as the examiner's head. The subject's was well illuminated. The head circumference (distance between the glabella and occipital protuberance); was then determined by having the subject look straight at the examiner while the tape was used to wrap around the occiput to the anterior portion of the skull.

The nasal height was measured as the distance between the nasion to nasopinale of the nose. Nasal width was measure as the distance between the two alar. The subjects were instructed to look forward while the sliding

caliper was placed on the nose of the subject; then scroll until it is tightly fixed on the subject's nose. Measurement was then taken with an accuracy of 0.01 cm; the nasal index was then calculated as nasal width distance/nasal height distance x 100. Statistical analysis was made with Z-test at significance level of 0.05

RESULTS

The results of this study were presented in Table 1-5. The mean values of the craniofacial parameters investigated were compared statistically using z-test. The results obtained indicated a sexual dimorphism with significantly higher values of all the parameters in males compared to corresponding females (p<0.05).

The mean head circumference for males and females were 57.49 and 56.25 cm respectively (Table 1). The mean nasal height for males and females were 4.08 and 3.89 cm respectively (Table 2). The mean nasal width for males and females were 4.06 and 3.79cm respectively (Table 3). The mean nasal index for males and females were 99.83 and 97.79, respectively (Table 4). The result

of the Z-test is shown in Table 5 while Table 6 shows the comparative data on other various populations.

DISCUSSION

Craniofacial anthropometry is important in the evaluation of facial trauma, facial defect, congenital and post traumatic deformities easy identification of certain congenital malformation and diagnosis of hypo/hypertelorism (Oladipo *et al.*, 2008a; Oladipo *et al.*, 2008b; Oladipo *et al.*, 2009a).

It is necessary to have local data of these parameters since this standard reflect the potentially different pattern of craniofacial growth resulting from racial, ethnic, sexual and dietary differences (Oladipo *et al.*, 2009b)

This study shows that males mean values are significantly larger than those of females (p<0.05). The result were in agreement with Franciscus and Long (1991) and Oladipo *et al.* (2010) who reported larger values for Head circumference, Nasal height, Nasal width and Nasal index in males than females but at variance with Oladipo *et al.* (2009c).

Table1: Result of head circumference of adult Ijaws

Subject type	Sex	Mean (cm)	STD	SEM	Sample size
Ijaws	Males	57.49	1.18	0.052	500
Ijaws	Females	56.25	1.49	0.066	500

STD: Standard Deviation, SEM: Standard Error of mean

Table 2: Result on nasal height of adult Ijaws

Subject type	Sex	Mean (cm)	STD	SEM	Sample size
Ijaws	Males	4.08	0.25	0.011	500
Ijaws	Females	3.89	0.30	0.013	500

STD: Standard Deviation, SEM: Standard Error of mean

Table 3: Result on nasal width of adult Ijaws

Subject type	Sex	Mean (cm)	STD	SEM	Sample size
Ijaws	Males	4.06	0.25	0.011	500
Ijaws	Females	3.79	0.25	0.011	500

STD: Standard Deviation, SEM: Standard Error of mean

Table 4: Result on nasal index of adult Ijaws

Subject type	Sex	Mean (cm)	STD	SEM	Sample size
Ijaws	Males	99.83	7.07	0.316	500
Ijaws	Females	97.79	8.15	0.364	500

STD: Standard Deviation, SEM: Standard Error of mean

Table 5: Results of significance test between males and females Ijaws

Parameters	Comparison	Z-critical	Z-calculated	Level of significance	Significant
Head circumference	Males vs Females	1.96	14.56	p<0.05	Significant
Bridge height	Males vs Females	1.96	10.87	p<0.05	Significant
Nasal width	Males vs Females	1.96	17.05	p<0.05	Significant
Males vs Females	Males vs Females	1.96	4.22	p<0.05	Significant

Table 6: Comparison of head circumference, nasal height, nasal width, nasal index of Ijaws with other population

Author/year	Population	HC (cm)	NH (cm)	NW (cm)	N.I
Ozturk <i>et al.</i> (2006)	Turkish	58.0(m) 55.9(f)	4.7(m) 4.2(f)	-	-
Oladipo <i>et al.</i> (2007)	Nigerian Ogonis	-	3.99(m) 3.91(f)	-	-
Oladipo <i>et al.</i> (2008a)	Nigerian Ijaws	-	4.71(m) 4.43(f)	-	-
Oladipo <i>et al.</i> (2009b)	Nigerian Yorubas	-	-	-	90.02(m) 83.58(f)
Presentstudy	Nigerian Ijaws	57.49(m) 56.25(f)	4.08(m) 3.89(f)	4.06(m) 3.79(f)	99.84 (m) 97.79 (f)

HC = Head circumference, NH = nasal height, NW = nasal width, NI = nasal index, m = male, f = female

Nasal index of Igbos (Oladipo *et al.*, 2009a) is larger than that of Ijaws. In conclusion, genetics and environmental factors are responsible for the variation in craniofacial dimension between and within populations (Cem *et al.*, 2001; Kasai *et al.*, 1993).

The result of this study will be of immense use in forensic medicine and anthropology and will also serve as a future framework for estimating the craniofacial dimensions of other Nigerians ethnic groups.

REFERENCES

- Cem, E., Y. Cengiz, E. Hamdi, D. Selim and D. Yasar, 2001. Normative values of craniofacial measurements in idiopathic benign microcephalic children. *The cleft palate. Cranio. J.*, 38(3): 260-263.
- Franciscus, R.G. and J.C. Long, 1991. Variation in human nasal height and breadth. *Am. J. Phys. Anthropol.*, 85: 419-42.
- Kasai, K., L.C. Richards and T. Brown, 1993. Comparative study of craniofacial morphology in Japanese and Australian aboriginal populations. *Hum. Biol.*, 65: 821-834.
- Oladipo, G.S., J.E. Olotu and B.C. Didia, 2007. Anthropometric study of nasal parameters of the ogonis in Nigeria. *Sci. Afr.*, 6(1): 69-71.
- Oladipo, G.S., B.C. Didia, P.D. Okoh and J.S. Hart, 2008a. Sexual dimorphism in facial dimensions of adults Ijaw. *J. Expt. Clin. Anat.*, 7(2): 10-14.
- Oladipo, G.S., E. Olotu and I.U. Guinireama, 2008b. Anthropometric comparison of canthal indices between the Ijaw and Igbo tribes. *Sci. Afr.*, 7(1): 141-144.
- Oladipo, G.S., H.B. Fawehinmi and P.D. Okoh, 2009a. Canthal indices of Urhobo and Itsekiri ethnic groups. *Aust. J. Basic Appl. Sci.*, 3(4): 3093-3096.
- Oladipo, G.S., H.B. Fawehinmi and Y.A. Suleiman, 2009b. The study of nasal parameters (nasal height, width and nasal index) among the Yorubas of Nigeria. *Int. J. Biol. Anthropol.*, 3(2): 1-19.
- Oladipo, G.S., M.A. Eroje and H.B. Fawehinmi, 2009c. Anthropometric comparison of the nasal indices between the Andoni and Okrika ethnic groups of Rivers State, Nigeria. *Int. J. Medic. Med. Sci.*, 1(4): 135-137.
- Oladipo, G.S., E. Chinagorom and G.O. Iruoghene, 2010. Craniofacial dimension of Ijaw children of Nigeria. *Biomed. Int.*, 1(2): 25-29.
- Ozturk, F., G. Yavas and U.U. Inan, 2006. Normal periocular and anthropometric measurements in Turkish population. *Ophthal. Epidemiol.*, 13(2): 14-19.
- Poswillo, D., 1963. Causal mechanism for craniofacial deformity. *J. Trop. Pediatrics*, 44: 973-977.