

## Anthropometric Studies of Cephalic Length, Cephalic Breadth and Cephalic Indices of the Ibibios of Nigeria

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**Abstract:** This study was aimed at determining the cephalic length, cephalic breadth and cephalic index of the Ibibios of Nigeria, which would be useful in clinical practice, forensic medicine, anthropology and genetic study. The study was carried out using 800 subjects of Ibibios who were between the ages of 18 – 80years, comprising of 400(four hundred) males and 400(four hundred) females. The subjects which were Ibibios by both parents and grandparent were randomly selected. The cephalic length (CL), cephalic breadth (CB) and cephalic index (CI) were determined using standard methods. The data obtained showed that the mean values of the CL, CB and CI were  $19.06 \pm 0.77$ cm,  $15.20 \pm 0.71$ cm and  $79.85 \pm 4.05$  respectively for males and  $18.80 \pm 0.77$ cm,  $14.70 \pm 0.67$ cm and  $78.36 \pm 6.12$  respectively for the females. The CI shows that Ibibio males and females belong to the mesocephalic group. The mean value of CL, CB, and CI for Ibibios (male and female) were  $18.93 \pm 0.79$ cm,  $14.95 \pm 0.73$ cm and  $79.11 \pm 5.24$  respectively. Statistical analysis using z-test indicated that significant difference exists between the males and the females with males showing higher values in all the parameters ( $p < 0.05$ ). This data is expected to be of clinical, forensic, anthropological and genetic importance.

**Key words:** Anthropometry, cephalic breadth, cephalic index, cephalic length, Ibibios

### INTRODUCTION

Measurements are important tools for comparison. In order to achieve a more objective racial assessment, metrical studies have long been practiced. Internationally accepted techniques of craniometry/cephalometry have promoted a large number of comparable data for male and to a lesser extent, females (Berry and Berry, 1976).

Cephalic index is very useful anthropologically to find out racial differences (Shah and Jadhav, 2004). It can also be utilized to find out sexual differences (Williams *et al.*, 1995). Comparison of changes between parents, offspring and siblings can give a clue to genetic transmission of inherited character (Shah and Jadhav, 2004).

Standardized cephalometric records enable diagnostic comparison between patients and the normal population (Rabey, 1971). Doliocephalic person have otitis media less often than brachycephalic person (Stolovitsky and Todd, 1990). It is also reported that individual with Apert's syndrome are hyperbrachycephalic (Cohen and Kreiborg, 1994).

A large number of reports exist on the cephalic index of Caucasians. Cephalic index of Japanese and Australia has been reported (Kasai *et al.*, 1993) while the mean cephalic index of 79.50 for 100 subjects of kvangaja race was also reported (Basu, 1963). The mean cephalic index

of 79.68 for 100 subjects of Bhils race was reported (Bhargav and Kher, 1960). Mean cephalic indices of 79.80 and 80.81 for Barelias and Gujarat races of Indian respectively were recorded (Shah and Jadhav, 2004; Bhargav and Kher, 1961).

Few reports however exist on the cephalic index of adult Africans. The studies on Africans have been mostly on fetuses (Obikili and Singh, 1992). Comparison between fetal cephalic indices of Nigerian and Caucasians with Nigerian showing significantly higher values (Okupe *et al.*, 1984). The cranial index of Nigerian using autopsy was studied (Ojikutu *et al.*, 1980). The cephalic index of Nigerians was also studied using living subjects (Obikili and Singh, 1992).

Anthropometric comparison of cephalic indices between the Urhobo and Itsekiri ethnic groups of Nigeria revealed a mean cephalic index of 82.16 and 86.80 among the Itsekiris and Urhobos respectively (Oladipo and Paul, 2009).

The first comprehensive report on cephalic indices of Ijaws and Igbos, reported the mean cephalic indices of 80.98, 78.24, 79.04 and 76.83 for Ijaw males, Ijaw females, Igbo males and Igbo females respectively (Oladipo and Olotu, 2006). Among the Ogonis, studies showed mean nasal indices of 106.1 and 90.9 among their males and females respectively (Oladipo *et al.*, 2007).

Table 1: Values of mean and SD of male subject

Age group	Number	Cephalic length (cm)	Cephalic breadth (cm)	Cephalic index
18-22	108	18.74±0.98	14.85±0.84	79.39±4.97
23-27	42	19.35±0.43	15.37±0.41	79.50±3.22
28-32	14	19.16±0.92	15.44±0.62	80.63±2.05
33-37	73	19.18±0.56	15.46±0.51	80.65±3.17
38-42	12	19.13±0.69	15.33±0.60	80.26±3.97
43-47	88	19.07±0.77	15.21±0.74	79.84±4.26
48-52	7	19.41±0.35	15.24±0.62	78.54±3.77
53-58	32	19.46±0.54	15.39±0.61	80.39±3.88
58-above	24	19.22±0.66	15.20±0.54	79.19±3.37

Table 2: Values of means and standard deviations of parameters in female subjects

Age group	Number	Cephalic length	Cephalic breadth	Cephalic index
18-22	121	18.65±0.71	14.60±0.70	78.20±4.32
23-27	92	18.86±0.62	14.70±0.63	78.10±3.67
28-32	29	18.62±1.69	14.90±0.98	81.40±18.36
33-37	57	18.76±0.59	14.70±0.52	78.50±2.88
38-42	17	19.03±0.58	14.90±0.62	78.30±2.84
43-47	44	19.04±0.56	14.80±0.64	77.90±4.04
48-52	23	19.12±0.49	14.80±0.54	77.60±2.83
53-57	15	18.89±0.62	14.70±0.61	78.10±3.93
58-above	2	18.30±0.14	14.30±1.27	78.20±7.56

Table 3: Total mean and standard deviation for both males and females

Variable	Males	Females	Z-critical	Z-calculated	Inference
Cephalic length (cm)	19.06±0.77	18.80±0.77	1.96	4.77	Significant
Cephalic breadth (cm)	15.20±0.71	14.70±0.67	1.96	10.24	Significant
Cephalic index	79.85±4.05	78.36±6.12	1.96	4.06	Significant

However, no study on the cephalic indices of the ethnic group under investigation has been carried out. This study was aimed at documenting the cephalic indices of Ibibios, which could be of importance in anthropological studies, forensic medicine and clinical practice.

**MATERIALS AND METHODS**

The present study was carried out in Uyo, Ibehikpo, Asutan and Essinuwin in Akwa-Ibom State of Nigeria between June and December 2009. Eight hundred (800) subjects of the Ibibio ethnic group with ages ranging from 18 - 83 years were used for the study. The eight hundred subjects were made up of four hundred (400) males and four hundred (400) females who were Ibibios by both parents and grandparents.

All subjects used for this study showed no facial deformities or scars. Subjects with craniofacial trauma and obstructive hairstyle were not used. The method used for assessing cephalic index is Hrdlicka's method 1952. The head length was measured with spreading caliper from glabellas to inions; the head breadth was measured as the maximum transverse diameter between the two fixed points over the parietal bones. All measurements were taken in centimeters to an accuracy of 0.10.

All measurement was taken with the subject sitting on a chair in a relaxed position. The cephalic index was calculated as maximum head breadth/maximum head length × 100. The data was subjected to statistical analysis using spss/pc<sup>+</sup> package.

Table 4: Means and standard deviations for the entire population (male and female combined)

Parameters	Mean	Standard deviation
Cephalic length (cm)	18.93	0.79
Cephalic breadth (cm)	14.95	0.75
Cephalic index	79.11	5.24

**RESULTS AND DISCUSSION**

Statistical analysis using spss/pc<sup>+</sup> package was carried out on the data collected. The results were presented in tabular form (Table 1-4). The mean cephalic indices in male subjects ranged from 78.54 to 80.65 (Table 1) and from 77.60 to 81.40 in female subjects (Table 2), which means that the Ibibio males and females are mesocephalic. The values of the mean, and standard deviation (SD), of cephalic length, cephalic breadth and cephalic index of all subjects were computed and analyzed statistically as shown in Table 3-4. In all the parameters males showed significantly higher values.

Comparison of the general trend of cephalic index of both sexes showed the calculated mean value of cephalic index recorded to be 79.85 and 78.36 for males and females respectively.

This means that the Ibibio males and females are within the mesocephalic group (Jansen, 1984).

The result obtained from this work has also shown that cephalic length (CL) is 19.06cm for males and 18.80 cm for females, cephalic breadth (CB) is 15.20 cm for males and 14.70 cm for females and cephalic index (CI) for the entire Ibibio population is 79.11±5.24. Thus the above parameters are sexually dimorphic amongst the

Ibibios. This is in agreement with previous studies on other Nigerian ethnic groups (Oladipo and Olotu, 2006; Oladipo and Paul, 2009).

### CONCLUSION

The present study has confirmed that the Ibibios of Nigeria have mesocephalic or intermediate head. This data is recommended to anthropologists, forensic experts geneticists and medical practitioners who may find it very useful.

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