The Circumference Interorbital Index Of Ijaw And Igbo Ethnic Groups In Nigeria

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Citation

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Abstract

Circumference interorbital index (C.I.I) is an important parameter in craniofacial anthropometry. The knowledge of its normal values for a particular region can be used in the treatment of certain craniofacial abnormalities. Thus the study was conducted to document and compare its values for possible ethnic differences between the two Nigerian ethnic groups (Ijaws and Igbos). A total of 1279adult Ijaws and Igbos were randomly selected for the study. These comprised 740 Ijaws and 539 Igbos. Four hundred and eight (408) of the Ijaws were males while 332 were females .Three hundred and thirty one(331) of the Igbos were males while 208 were females .The Igbos were selected from Enugu in Enugu State while Ijaws were selected from Yenagoa in Bayelsa State. The inner canthal distances (ICD) and head circumferences (HC) of the subjects were measured using standard anthropometric methods and circumference interorbital index calculated as ICD/H.C x 100. The result obtained showed that Ijaw females had a C.I.I of 8.10, Ijaw males 7.80, Igbo females 6.50, and Igbo males 6.20. Thus, Ijaw females (8.10) had the highest C.I.I while Igbo males (6.20) had the lowest. Significant differences ($p<.05$) were observed between the two ethnic groups. Also circumference interorbital index was found to be sexually dimorphic. The result of this study will be of importance in anthropology, genetics, forensic medicine and craniofacial surgery.

INTRODUCTION

The evaluation and measurement of the human body dimensions are achieved by physical anthropometry [(1)] . The human body dimensions are affected by ecological, geographical, racial, gender and age factors [(2,3)] . Physical differences between people can be recorded by measurement, and based on these measurements different indices can be worked out and used in differentiation of racial and gender differences [4,5,6,7] .

Craniofacial anthropometry has become an important tool used in genetic counseling, reconstructive surgery and forensic medicine [8,9,10,11,12] . Most of the craniofacial parameters have been studied extensively in most populations of the world including Nigeria. Such parameters include: nasal parameters [13,14,15,16,17] , orbital dimensions and canthal distances [11,18] , facial height, mandibular height, maxillary height and orofacial height [12,19] .

Reports on circumference interorbital index (CI-I) are however few with no record on Nigerian population. Circumference interorbital index of African American has been studied. Reports show that male and female of this population have mean values of 5.89 and 5.98 respectively [20] . Turkish population have mean CI-I of 5.60 and 5.65 for male and female respectively [2] .Thus the present study was aimed at documenting standard values of CI-I for Igbos and Ijaws and also at comparing the values between these two Nigerian ethnic groups and with available data from other populations of the world for any ethnic or racial differences which would be very useful in anthropological studies, craniofacial surgery, diagnosis of craniofacial anomalies and forensic medicine.

The Igbos constitute one of the Nigerian major tribes. They are mostly found in the Eastern part of the country. They are mostly traders by profession, although some are farmers. They speak Igbo. The Ijaws on the other hand constitute the largest minority group in Nigeria. They are found in the Niger Delta area, mostly in Bayelsa, Rivers, Ondo and Lagos States. They are predominantly fishermen; they speak Ijaw.

MATERIALS AND METHODS

In the present study, one thousand two hundred and seventy nine (1279) subjects were selected randomly from Enugu in Enugu State (Igbos) and Yenegoa in Bayelsa State (Ijaws) between February to November, 2007. The ages of the subject ranged from 18 -52 years. Seven hundred and forty

(740) were Ijaws by both parents and grand parents. Four hundred and eight (408) of them were males while three hundred and thirty two (332) were females. The remaining five hundred and thirty nine (539) were Igbos by both parents and grand parents. Three hundred and thirty one (331) of them were males while two hundred and eight (208) were females.

All the subjects used for this study had normal craniofacial configuration, no regular physical training such as karate, judo e.t.c., which might have exerted stimulus on the growth dimension of the head and face. Subjects with any craniofacial abnormality such as: macrocephaly, microcephaly, telecanthus, epicanthus, hypertelorism e.t.c., or prior craniofacial surgery were excluded. All subjects gave their consent

The measurements were taken at a fixed time between 9am and 4:30pm to eliminate the discrepancies due to diurnal variation. Standard methods were used for all measurements [2,3] .

The inner canthal distance was determined by having the subject look straight in an anatomical position at the examiner, while the non- stretchable transparent centimeter ruler was held tightly against the bridge of the nose of the subject and the reading was taken from the left medial angle to right medial angle of the palpebral fissures. This gave the innercanthal distance (ICD). The head circumference was determined using tape rule from the occipital prominence to the supra orbital bridge. In the case of some fashionable hairstyles, the tape was drawn tightly and compressed against the hair as much as possible. In cases of braids female subjects, the tape was allowed to come in contact with the skin and not over the lump of the hair.

All measurement was taken with the same instruments and the subject seated on a plastic chair opposite the examiner. The subject head was at the same level as the examiner head. The subjects face was well illuminated. Circumference interorbital index was calculated as the ratio of inner intercanthal distance over the head circumference multiplied by 100 (CI-I= ICD/HCx100).

RESULTS

The results of this study are presented in tables 1-3 .The mean circumference inter orbital indices of Ijaws and Igbos males were found to be 7.80 and 6.20 respectively while the mean circumference inter orbital indices of Ijaw and Igbo females were 8.10 and 6.50 respectively. For the total population, (male and female) Ijaw ethnic group had a mean circumference inter orbital index of 7.90 while Igbo group (males and females) had a mean circumference inter orbital index of 6.30 (Table1).Generally females had higher value than males in the two ethnic groups.

In all Ijaw females had the highest mean circumference inter orbital index (8.10) while Igbo females have the lowest mean circumference inter orbital index (6.50). The difference between the two ethnic groups were statistically significant ($p<0.05$) (Table2).

Figure 1

Table 1. Circumference interorbital index (CI.I) of Igbo and Ijaw ethnic groups.

	Males		Female		Total(male+ female)	
Variables	Ijaw	Igbo	Ijaw	Igbo	Ijaw	Igbo
Mean(CI.I)	7.80	6.20	8.10	6.50	7.90	6.30
SD	2.20	0.50	0.60	0.20	1.60	0.40
Sample size	408	331	332	208	740	539

Figure 2

Table 2.Z-test result of comparison of Circumference interorbital index (CI.I) between the Ijaws and Igbos.

Variables	Z Calculated	Z -Critical	Decision
Ijaw males vs. Igbo males	13.7	1.96	significant
Ijaw females vs. Igbo females	160.0	1.96	significant
Ijaw males vs. Ijaw females	25.0	1.96	significant
Ijaw female vs. Igbo males	43.0	1.96	significant
Ijaw male vs. Igbo females	98.0	1.96	significant
Ijaw vs. Igbo(Total)	26.2	1.96	significant

Figure 3

Table 3. Comparison of circumference interorbital index of this study with other populations

Authors/Year	Population	Circumference interorbital index (CI-I) ±SD	
		Male	Female
Juberg *et al.,1975*	African American	5.89±0.48	5.98±0.39
Everekliogl*u et al.*,2001	Turkish	5.60±0.42	5.65±0.34
Everekliogl*u et al.*,2002	Turkish	5.58±0.40	5.64±0.42
Present study	Ijaws	7.80±2.20	8.10±0.60
Present study	Igbos	6.20±0.50	6.50±0.20

DISCUSSION

Anthropometric studies are an integral part of biological variability [21,22] , forensic investigation [23,24,25] , craniofacial surgery & syndromology [26] . Normal values of inter canthal distances, head circumference and circumference interorbital index are vital measurements in the evaluation , and

diagnosis of craniofacial syndromes and post traumatic deformities, and knowledge of the normal values for a particular region can be used to treat abnormalities to produce the best esthetics and functional result [(3)] . For these purposes, standards based on local data are desirable, since these standards reflect the different patterns of craniofacial growth resulting from racial, ethnic ,social and dietary differences.

The present study has exposed the uniqueness of Ijaws and Igbos with respect to their mean circumference interorbital indices. The study found the mean circumference interorbital indices of Ijaws (7.90) to be higher than that of the Igbos (6.30). The differences were statistically significant ($p<0.05$).The values were sexually dimorphic in the two ethnic groups. This is in agreement with earlier authors [3,19] . The values reported for the two Nigerian populations in the present study were significantly higher than those earlier reported for other populations of the world (table 3). This has clearly shown that circumference interorbital index differs amongst different ethnic groups and that values for each ethnic group are necessary since a value for a group is not applicable in another group. It is also clear from the present study that Nigerian populations when compared with other tribes of the world previously studied show higher values. The highest on the list was Ijaw ethnic group followed by Igbos and African Americans. Thus African seems to have higher values compared to Caucasians earlier reported [2] .

CONCLUSION

Considering the standard methods used in carrying out this study, the scarcity as well as absence of data on the above subject, most especially in Nigerian populations and the importance of this anthropometric parameter in forensic medicine, anthropological studies and craniofacial surgery, we recommend that anthropologists, clinicians and forensic experts should obtain this data and used in their quest for knowledge . We also recommend that more studies covering most tribes and ethnic groups of the world should be carried out for comprehensive documentation.

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