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Canthal Indices of Urhobo and Itsekiri Ethnic Groups

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Abstract: Canthal index is an important component of craniofacial anthropometry. Craniofacial anthropometry is vital in making a precise and systematic measurement of human skull. One thousand (1000) adults comprising 500 males and 500 females were used for this study. Five hundred (500) comprising 250 males and 250 females were from either Urhobo or Itsekiri ethnic group of Delta state. All the subjects were drawn from Warri in Delta State. The subjects were measured for inner and outer canthal distances using a non stretchable plastic ruler and the canthal index was calculated. The results showed that Urhobo males and females had inner canthal distances of 3.40cm and 3.00cm respectively, outer canthal distances of 13.10cm and 12.10cm and mean canthal indices of 24.38 and 29.38 respectively while Itsekiri males and females had inner canthal distances of 3.50cm and 3.30cm respectively ,outer canthal distances of 12.90cm and 11.40cm and mean canthal indices of 26.03 and 27.07 respectively .Canthal index in Urhobo female is larger than that of Itsekiri female and canthal index in Itsekiri male is larger than urhobo male ($p<0.05$) using Z-test. The canthal index in the two ethnic groups was sexually dimorphic. This study will be useful in anthropology and medicine most especially in craniofacial surgery.

Key words: Inner canthal distance, outer canthal distance, canthal index, craniofacial anthropometry.

INTRODUCTION

Anthropometry is concerned with measurement of physical sizes and shapes of human body [1].Craniofacial anthropometry is an integral part of craniofacial surgery and syndromology [2].It is a technique used in both physical and clinical anthropology comprising precise and systematic measurements of the bones of the human skull [3]. Craniofacial anthropometry also includes measurements of the medial (inner) and lateral (outer) canthal distance and canthal 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.,* (2008) reported that the canthal index of male Ijaws and Igbos were 37.04 and 35.15 respectively and female ijaws and Igbos were 33.11 and 32.59 respectively. Similar studies were carried out by Cem *et al.,* (2001) in Turkey. He reported the inner canthal distance, outer canthal distance and canthal index of 28.33mm, 81.74mm, and 34.66 respectively for Turkish males while those of females were 28.14mm, 81.17mm and 34.66 respectively.

Although Nigeria is the most populous country in Africa, she has few reports on craniofacial anthropometry Oladipo *et al.,* (2008) while Urhobo and Itsekiri being her ethnic groups have none. Thus the aim of this study was to find out the outer and inner canthal distances and the canthal index among the Urhobo and Itsekiri ethnic groups of Delta State which could be of importance in Clinical practice, Forensic Anthropology, Genetics and paleoanthropological studies.

MATERIALS AND METHODS

This research was carried out on Itsekiri and Urhobo ethnic groups in Delta State .One thousand (1000) adults (18-45years) were selected randomly from Delta rainbow television, Nana model college I and II, Uwangue college I and II, Institute of continuing education, Hussey college I and II, Staff of treasury cash office, Liaison office, Ministry of information, Ministry of transport and inhabitants of Okere market road all in Warri Delta state. Five hundred (500) comprising 250 females and 250 males were Itsekiris while 500 comprising 250 males and 250 females were Urhobos by both parents and grand parents. Subjects with

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craniofacial defects were not used. The method used for assessing the canthal index was Cem et al method Cem *et al.,* (2001). A non stretchable plastic ruler with 0.5cm interval was used for the measurement. The subject was seated comfortably in a chair with his/her head at the same level as the examiner's head. The subject's face was well illuminated. The inner canthal distance (distance between medial angles of the two eyes) was then determined by having the subject look straight at the examiner while the ruler was held tightly against the bridge of the nose of the subject. The inner canthal distance was measured as the distance from the medial angle of the left eye (left medial angle) to the medial angle of the right eye (right medial angle) as shown in Figure 1. The subjects were instructed to look upward for outer canthal distances (distance between lateral angles of the two eye), thus maximizing the contrast between the sclera and skin measured between the medial and lateral palpebral fissure ,respectively. The outer canthal distance was measured as the distance from the lateral angles of the left eye (left lateral angle) to the lateral angle of the right eye (right lateral angle) as shown in Figure 1. Canthal index was then calculated as inner canthal distance/outer canthal distance X 100. Statistical analysis was made with Z-test at significance level of 0.05.

RESULTS AND DISCUSSION

The results of this study are presented on tables 1-4.The mean values of the canthal parameters investigated were compared statistically using Z-test. It was observed that all the values were significantly different between the two ethnic groups ($P< 0.05$). Also sexual dimorphism was observed in the two groups .The mean inner canthal distance for Urhobo males and females were3.4cm and 3.0cm respectively while Itsekiri males and females were 3.5cm and 3.3cm respectively (Table 1) .The mean outer canthal distance for Urhobo males and female were 13.1cm and 12.1cm respectively while Itsekiris were 12.9cm and 11.4cm respectively (Table 2) .The mean canthal indices among Urhobo males and females were found to be 24.38 and 29.38 respectively while the canthal indices in Itsekiri males and females were found to be 26.03 and 27.07 respectively (Table 3).The mean canthal index of the Urhobos was 26.88 and that of Itsekiri was 26.55 (Table 3). Table 5 consists of comparative results of canthal indices (C.I) of some Nigerian Ijaws, Igbos, Urhobos, Itsekiris and other races.

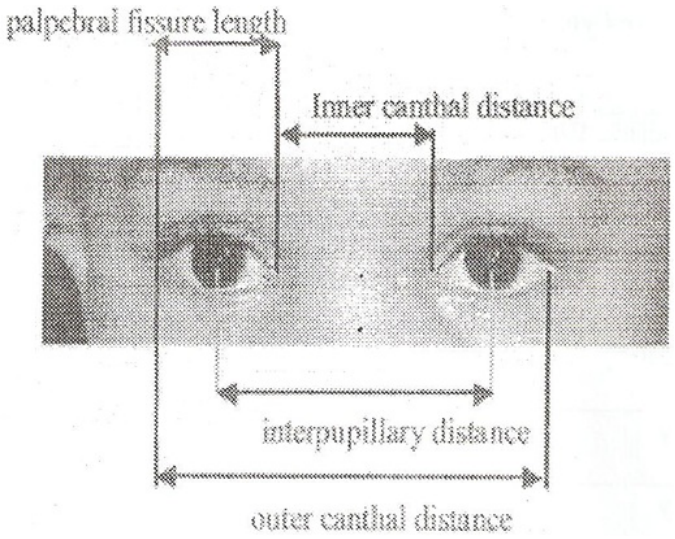

Fig. 1: Measurement of inner and outer canthal distances

Table 1: Results on inner canthal distance of Urhobos and Itsekiris

Subject type	Sex	Mean(cm)	STD	SEM	Sample size
Urhobo	Female	3.00	0.39	0.025	250
Urhobo	Male	3.40	0.14	0.009	250
Itsekiri	Female	3.30	0.12	0.007	250
Itsekiri	Male	3.50	0.16	0.106	250

STD- standard deviation; SEM- standard error of mean

Table 2: Result on outer canthal distance of Urhobos and Itsekiris

Subject type	Sex	Mean(cm)	STD	SEM	Sample size
Urhobo	Female	12.10	0.2071	0.0131	250
Urhobo	Male	13.10	0.2786	0.0176	250
Itsekiri	Female	11.40	0.5346	0.0338	250
Itsekiri	Male	12.90	0.4274	0.0270	250

STD- standard deviation; SEM- standard error of mean

Table 3: Results of Urhobos and Itsekiris

Subject Type	Sex	Mean(cm)	STD	SEM	Sample Size
Urhobo	Female	29.38	1.37	0.087	250
Urhobo	Male	24.38	1.96	0.124	250
Itsekiri	Female	27.07	1.35	0.086	250
Itsekiri	Male	26.03	1.46	0.092	250

STD- standard deviation; SEM- standard error of mean

Table 4: Result on significant test among Urhobos and Itsekiris

Comparing subject type	T-calculated	T-tabulated	Significant level	Test result
Urhobo male and Itsekiri female	7.612	1.655	0.05	Significant
Urhobo female and Itsekiri female	13.39	1.655	0.05	Significant
Urhobo male and urhobo female	23.6845	1.655	0.05	Significant
Itsekiri female and Itsekiri male	5.8459	1.655	0.05	Significant

Table 5: Comparison of canthal index of Urhobos and Itsekiris with other populations.

Investigator/year	Population	Male mean C.I	Female mean C.I
Singh&Banerjee1983[7]	India	37.32	37.82
Cem et al 2001 [6]	Turkish	34.67	34.66
Juberg et al., 1975[(8)]	African-American	38.38	38.50
Erika et al (2005)[9]	Latvian	27.38	26.44
Oladipo et al 2008[5]	I jaw	37.04	33.11
Oladipo et al 2008[5]	Igbo	35.15	32.59
Present study	Urhobo	24.38	29.38
Present study	Itsekiri	26.03	27.7

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.The normal value of inner and outer canthal distance and canthal index is important for successful reconstruction of the canthal area. Thus it is necessary to have a local data of this parameters since these standard reflect the potentially different patterns of craniofacial growth resulting from racial, ethnic, sexual and dietary differences.

The study shows that the canthal indices of female in both tribes are significantly larger than those of males and it is lowest in urhobo males. Thus the two ethnic groups seem to have different origin based on the result of the study.

The result were in agreement with Singh and Banerjee (1986) and Juberg *et al.,* (1975) who reported larger values for canthal index in females than males but at variance with Cem *et al.,* (2001) and Erika *et al.,* (2005).

Cephalic index among the ijaws and Igbos are larger than that of Urhobos and Itsekiris. In conclusion, genetics and environmental factors are responsible for the variation in canthal indices and other craniofacial indices between and within populations (Cem *et al.,* 2001; Kasai *et al.,* 1993).

The Urhobos and Itsekiris seem to have different origin since the canthal index of the two tribes was found to be different. 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 canthal index of Nigerians.

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