

ORBITAL MEASUREMENTS AMONG THE EHTNIC GROUPS OF PLATEAU STATE, NIGERIA

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ABSTRACTS

Cephalomerty is a branch of anthropometry that describes measurement of head and face in cadaveric, living, or radiological specimen.

This aspect of physical anthropology has been widely used in a substantial aspect of medicine. Of particular relevance in this study is its application in the field of ophthalmology and optometry.

The aim of this study is to provide a baseline measurements of these orbital parameters for plateau state indigenes of various ethnic groups and to compare with other studies in Nigeria and other countries.

The subjects used in this study were 213 medical students of Plateau state studying at University of Jos.

Out of the four parameters, namely outer canthal distance, papebral fissure length, intercanthal distance and interpupillary distance, only outer canthal distance and papebral fissure length show any significance difference (p-value <0.05) between plateau state ethnic groups and Hausa/Fulani tribes. There is no significance difference between the ethnic group under study and other ethnic

groups with respect to these orbital parameters.

Key words: Orbital, Ethnic, Measurements

INTRODUCTION

Cephalomerty is a branch of anthropometry that describes measurement of head and face in cadaveric, living, or radiological specimen.

This aspect of physical anthropology has been widely used in a substantial aspect of medicine.

Generally, anthropometry provides the single most reliable, universally applicable, inexpensive and non-invasive technique for assessing the size, proportion and composition of the human body. It reflects both health and nutritional status and predicts performance, health and survival. As such it is a valuable but currently under used tool for guiding public health policy and clinical decisions. Of particular relevance in this study is its application in the field of ophthalmology and optometry.

Attempts to establish reliable cephalometric differentiation between races are as old as craniometry itself, and although the mandible

and cranial capacity are in this connection less dependable, satisfactory characterization has been established for some racial groups and especially for Caucasian and Negroes(Wescott and Jantz 1999).

Thus, the simplest of the parameters in anthropometry, including, height, weight, length, thickness and widths of various parts of the body vary from tribe to tribe and one race to the other on one hand. On the other hand, these measurements also differ amongst different age groups and between the two sexes as well (Baretto and Mathog 199). Generally variation measured in anthropometry is those controlled by polygenic inheritance and other factors such as sex, age, and nutritional status. Varrella, 1990.

Sometimes the use of parameters as this could be used to trace the origin of tribes as it was used in North America. Assiniboine and Yanktonai tribe of North America were believed to come from the same origin in early 17th Century by historians, archaeologists and skeletal biologists.

Wescott and Jantz 1999 compared the head and face dimensions of the two groups, their findings suggested that there is a much more distant split between the two groups than has been traditionally put forth, more so, there is a higher variance within the Yanktonai group phenotype than expected amongst the Assiniboine, this clearly indicated that their differentiation is due to time and gene flow from outside groups.

MATERIAL AND METHODS

The subjects used in this study were 213 medical students of Plateau state origin studying at University of Jos.

Instruments used include weighing balance (Essential China), measuring tape, sliding and spreading calipers and transparent graded meter rule.

The orbital measurements (namely, outer canthal distance (OCD), inner canthal distance (ICD), interpupillary distance (IPD) and palpebral fissure length (PFL)) were recorded with the subjects sitting in upright position Frankfurt's horizontal position (see figures attached).

Outer canthal distance (fig.1) is the distance between the outer canthi of the two eyes.

Inner canthal distance (fig. 2) is the distance between the inner canthi of the two eyes.

Palpebral fissure length (fig.3) is the distance between the inner and outer canthi of the eye.

Interpupillary distance (fig.4) is the distance between the centers of the two eyes.

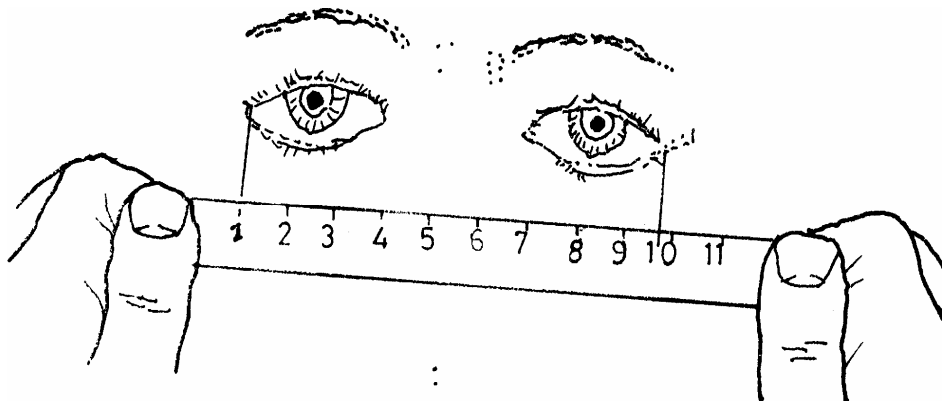
RESULTS

A total of two hundred and thirteen students were used (213). Out of which (155) were males, while (58) were females. They were all of age range 18- 36yrs and mean weight is 60.25 ± 10.179 kg, mean height $1.6852 \pm 8.33E-02$ m.

Table 1

	N	MEAN	SD	SE	95% C.I FOR MEAN L.BOUND	U.BOUND	MIN.	MAX.
OCD	213	113.803	1.1429	7.83E-02	112.259	115.347	15	140
ICD	213	46.958	1.2385	8.49E-02	45.285	48.631	35	150
PFL	213	37.559	0.5749	3.94E-02	36.782	38.335	30	85
IPD	213	89	0.917	6.28E-02	87.761	90.239	35	105

From table 1 the minimum outercanthal distance distance is 15mm while the maximum is 140mm with mean distance as 11.38mm \pm 1.14SD and SE of 7.83E-02. The minimum innercanthal distance is 35mm while the maximum canthal distance is 150mm with the mean intercanthal distance as 4.70mm \pm 1.23SD and SE of 8,49E-02. The plapebral fissure length minimum distance is 30mm and maximum distance of 85mm while the mean plapebral fissure length is 3.76mm \pm 0.58SD and SE of 3.94E-02. The interpupillary distance minimum distance is 35mm and maximum distance is 105mm , the mean interpupillary distance is 8.9mm \pm 0.92SD with SE of 6.28E-02

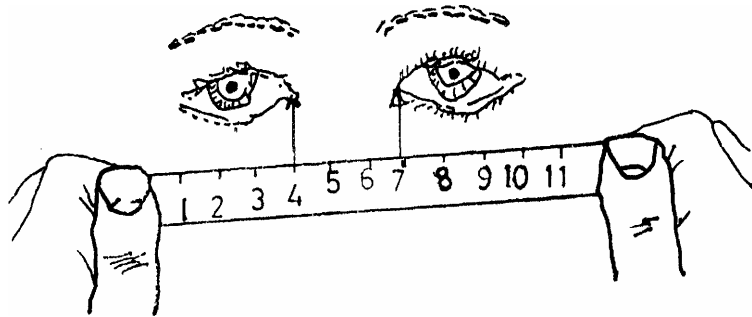


Outer canthal distance: - is the distance between outer canthi of the two eyes.

Landmarks: - measure from the most lateral corner of one eye to the most lateral corner of the other eye in a straight line.

Instrument: - A graduated transparent ruler.

FIG. 1

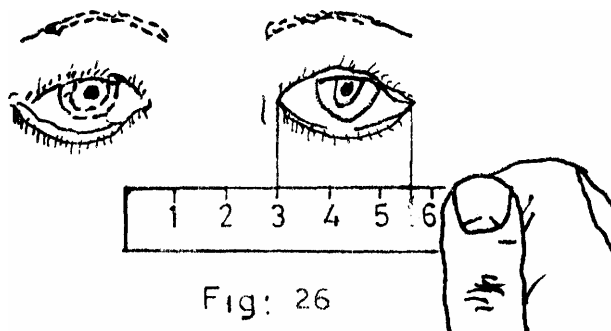


Inner canthal distance: - is the distance to the inner canthi of the two eyes.

Landmarks: - measure from the inner most corner of one eye to the inner most corner of the other eye in a straight line.

Instrument: - A graduated transparent ruler.

FIG. 2

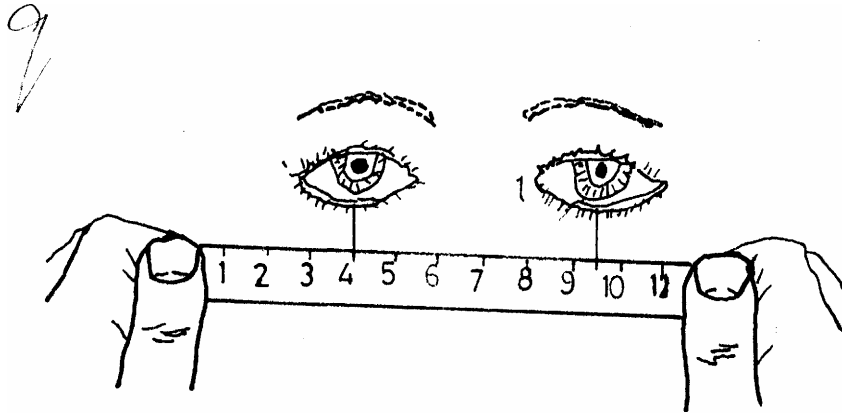


Palpebral fissure length: - is the distance between the inner and outer canthi of the eye.

Landmarks: - measure from the inner to the outer canthi of a particular eye (Right and Left)

Instrument: - A graduated transparent ruler.

FIG. 3



Interpupillary Distance: - is the distance between the centers of the two eyes.

Landmarks: - measure between the centers of both pupils.

Instrument: - A graduated transparent ruler.

FIG. 4

DISCUSSION

At birth the orbits are large and the germs of the developing teeth lie close to their orbital floor. In a study that evaluated pattern of craniofacial dimorphism, a sample of 82 showed that dimension of the viscerocranium tend to be dimorphic than those of the neurocranium and orbits.

Similar studies were conducted in Jos by Umar 2004 and when compared to this present work it was found out that the mean difference for outer canthal distance was significantly different ($p < 0.05$) level between the subjects under study and Hausa/Fulani ethnic group which have a mean value of 109.508mm mean difference of 0.4294 and standard deviation of 0.1496. Also for palpebral fissure length there was significant difference between the group and the same Hausa/Fulani with mean value

of 35.068mm, mean difference of .2491 and standard deviation of 6.96E-02. These findings agree with a similar study conducted in Kano among the Hausa/Fulani, Taura 2002. In other studies carried out elsewhere among the whites and black Americans Barreto and Mathog 1999, the values for blacks for these parameters were found to be higher than the values for the whites and they concluded that ethnic background should be considered when evaluating orbital and facial anatomy.

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