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"ORBITAL INDEX AMONG IKA ETHNIC GROUP OF DELTA STATE IN NIGERIA"

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ABSTRACT

The orbit is the bony socket of the skull in which the eye and its appendages are located. Normal values of orbital height, orbital width and orbital index are vital anthropometric measurements in evaluation and diagnosis of craniofacial anomalies. The aim of this study was to determine the orbital index of the Ika ethnic group of Delta State in Nigeria. Totality of 384 adults (males 200; females 184) between the ages of 18-35years were sampled for this study. The dimensions of the orbits for right and left sides were measured using a venier caliper. Orbital height and width for male was 25.17±4.29mm; 33.23±3.98mm and that for female was 23.36±3.53mm; 31.83±3.68mm correspondingly. The orbital index was 74.56 ± 7.67 and 74.83 ± 8.5 for right and left sides respectively, the orbital index for male and female was 75.58 ± 8.21 and 73.46 ± 7.94 respectively. The Ika ethnic group belongs to the microseme group.

INTRODUCTION

The human orbital cavity is an anatomical region and has four bony walls with particular features and is perforated by nerves and blood vessels (Swetha & Mohanraj, 2019). The orbits are hollow bony cavities in the facial skeleton. The orbits contain and protect the eyeballs and accessory visual structures. In human, the eye occupies 6.5ml of the orbit volume (Anibor & Ighodae, 2016). The orbit cavity has a larger width than height and the relationship between the width and the height is ascertained by the orbital index which usually varies with ethnicity and race (Patnaik *et al*., 2001).

From the values obtained for orbital index, three categories of orbital index are given for human populations. The megaseme and microsome categories were explained for white and black races respectively by Cassidy (1913). The megaseme is an orbital index with range of 89 or more, while the microseme category is within the orbital index range of 83 or less. Another category, the mesoseme, lies within the range between 83 and 89 (Mcgraw, 2003).

Literature searching revealed paucity of information on the orbital index of the Ika ethnic faction. The endeavor of this toil was to verify the orbital index of the Ika ethnic faction. The results from this scholarly effort will guide optometrists, maxillofacial surgeons, plastic surgeons and those involved in the fabrication of eye goggles.

MATERIALS AND METHODS

A descriptive cross sectional study design was utilized for this research after ethical authorization from the Anatomy Department of the Delta State University, Abraka in Nigeria. This study was carried out in Agbor town, in Ika South Local Government Area, Delta State in Nigeria. Three hundred and eighty-four adult volunteers (200 males, 184 females) between the ages of 18-35years of Ika ethnic set without any craniofacial abnormality formed the study sample. A pair of digital venier calipers was used to carry out anthropometric measurement of orbit dimensions.

The orbital index was calculated with the formula:

Orbital index = Orbital height/Orbital width × 100.

The data collected was subjected to statistical analysis using SPSS (Statistical Package for the Social Sciences), version 23. The orbital indices of both right and left sides was compared using the students' paired sample t-test, the results were also compared in both genders using the students' t-test. The difference was considered statistically significant when probability is less than 0.05 ($P<0.05$).

RESULTS

Table 1: Comparison of Orbital Dimensions on both sides

Parameters	Right side	Left side	T	Df	Significance (2-tailed)
Orbital height	24.54 ± 4.07	24.25 ± 4.077	7.700670393	0.383	0.00*
Orbital width	32.85 ± 3.88	32.39 ± 3.94	5.704556537	0.383	0.00*
Orbital index	74.56 ± 7.67	74.83 ± 8.5	-1.110316249	0.383	0.268**

Results are presented as mean ± Standard deviation, *=statistically significant ($P<0.05$). **=not statistically significant ($P>0.05$).

Table 2: Comparison of orbital dimensions in both gender

Parameters	Male	Female	P-value
Orbital height	25.17 ± 4.29	23.36 ± 3.53	0.00*
Orbital width	33.23 ± 3.98	31.83 ± 3.68	0.00*
Orbital index	75.58 ± 8.21	73.46 ± 7.94	0.00*

Results are presented as mean ± Standard deviation, *=statistically significant (P<0.05). **= not statistically significant (P>0.05).
Orbital index was 75.58±8.21mm for male, and 73.46±7.94 in female; and this differences was found to be statistically significant (p<0.05).

DISCUSSION

This present study showed that the orbital index was 74.56 ± 7.67 (right) and 74.83 ± 8.5 (left). The orbital index was 75.58 ± 8.21 (male) and 73.46 ± 7.94 (female) respectively, and a statistical remarkable difference existed between them. This value placed the Ika ethnic group in the microseme group of orbit which is in agreement with previous studies which put Africans in microseme group (Ebeye & Otikpo, 2013; Ezeuko and Om'Iniabohs, 2015; Anibor & Ighodae, 2016; Botwe *et al*., 2017;).
Orbit height and width for male was 25.17±4.29mm; 33.23±3.98mm and that for female was 23.36±3.53mm; 31.83±3.68mm, and a significant (p<0.005) difference exist between them. These values are in agreement with previous research that observed sexual difference in orbital parameters (Ebeye and Otipko, 2013). This research does not agree with Leko *et al* (2012), who posed that sexual difference does not exist for orbital height, width and index between both genders.
Scrutiny of orbital index in grown-up Malawians is at variance with this inquiry as the Malawian orbit is of the megaseme sort (Igbigbi and Ebite, 2010), furthermore the investigation of Ukoha *et al*., 2011 also vary from this scrutiny as it concured with Igbigbi and Ebite (2010). The differences observed in the various studies mentioned above could be owed to the different methodologies, different sampled ages and sensitivity of the measuring equipment used. This study made use of direct anthropometric measurement, using a sensitive digital venier caliper.

CONCLUSION

The Ika people of Delta State in Nigeria belong to the Microseme orbital group. This study has provided useful baseline reference data for the Ika ethnic group.

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