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Photometric Facial Analysis of the Urhobo Ethnic Group in Nigeria

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Abstract

Photometric analyses are been done to determine the facial angles in humans as such techniques reduce or eliminate the radiation patients are exposed to. Angles of aesthetic triangle for Urhobo ethnic group in Nigeria were determined in this study. All were healthy subjects aged 18-25 years. Significant differences were observed between Urhobo males and females in Nasofrontal and Mentocervical angles ($p < 0.05$) but not in the Nasofacial and Nasomental angles ($p > 0.05$). The Urhobo subjects have a mean Nasofrontal angle of 116.28° ; Nasofacial angle of 38.5° ; Nasomental angle of 127.2° and Mentocervical angle of 87.35° . The findings of this study will form a baseline data for the Urhobo people. This study shows that these aesthetic angles (Nasofacial, Nasofrontal, Nasomental and Mentocervical angles) may serve as means of ethnic and racial identification. The Nasofacial and Mentocervical angles may also serve as tools in gender differentiation.

Keywords: Aesthetic angles, Urhobo, ethnic group, Nigeria.

INTRODUCTION

Cephalometric techniques have been used by numerous researchers to produce standard values for skeletal, dental and soft tissue structures for different ethnic groups [1,2] as well as in forensic medicine [3]. In recent studies photometric angles are been done to determine aesthetic facial angles in humans.

It is well established that a single standard of facial aesthetics is not appropriate for application to diverse racial and ethnic groups [4,5,6]. Therefore, researches on craniofacial study of different ethnic groups are on going to establish ethnic specific anthropometric data [7].

Cephalometric standards for Iranians [8], Saudis [9], Jordanians [10] and Egyptians [11,12] have been established. A photometric study was done to determine the aesthetic facial angles of North Americans and Indians [13]. Values of cephalometric norms such as the aesthetic facial angles of African tribes are not readily available compared to those from other parts of the world. Some

cephalometric angles have been determined for Nigerians [14]. Dentoskeletal angles were determined for the Igbos in Nigeria [15]. Cephalometric standards have also been established and compared for Cameroonians and the French [16].

Literature search did not reveal any study on the photometric facial analysis of the Urhobo people in the Niger-Delta region of Nigeria. Powell and Humpherys introduced the Nasofacial, Nasofrontal, Nasomental and Mentocervical angles in the concept of aesthetic facial analysis [17]. This present study was carried out to document and form a baseline data of aesthetic facial angles amongst the Urhobo ethnic group. Its use cannot be overemphasized in clinical practice, forensic and anthropological studies. Also the use of photographic images for evaluation would reduce or eliminate patient's exposure to radiation.

MATERIALS AND METHODS

This observational and cross sectional study was carried out using 100 subjects aged between 18 and 25 years. 50 were males while 50 were females. Parents and grand parents of subjects were all of Urhobo ethnic origin. Consent was obtained from the subjects. Also prior to the commencement of the study, permission was obtained from the Research and Ethics Committee of the College of Health Sciences in Delta State University.

All the subjects had complete dentition, class 1 occlusion, competent lips and without symptoms and signs of craniofacial anomalies. There was no history of orthodontic treatment. Photographs of the lateral views of their faces were taken using a digital lens camera. All the photographs were taken with the subjects sitting in a relaxed position with their heads held in the natural head position. Computer assisted analysis of the facial photographs was done. The photographs were transferred into a computer by a universal serial bus (USB) cord. The following soft tissue points were introduced on the photographic images: the Glabella (Gl), Nasion (N), Subnasale (Sn), Menton (Mn), Porion (Po), Subcervicale (Sc) and Pogonion (Pog) as shown in Figure 1. Iconographic protractor screen software was used to measure the Nasofrontal, Nasofacial, Nasomental and Mentocervical angles as shown in Figures 2, 3, 4 and 5 respectively. The data was analyzed using the Statistical Package for Social Sciences. Student t-test was applied to test for significant differences between male and female subjects.

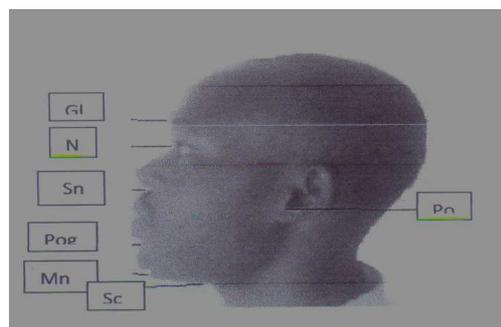


Figure 1: Facial soft tissue points.



Figure 2: Nasofrontal angle formed by drawing a line tangent to glabella through the nasion that will intersect a line drawn tangent to nasal dorsum.

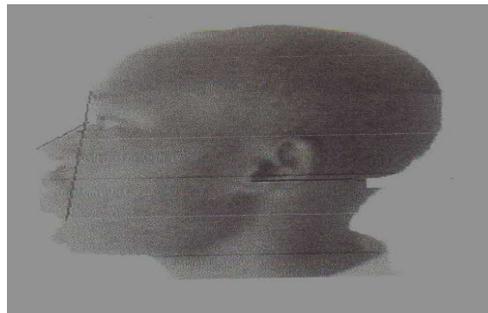


Figure 3: Nasofacial angle formed by drawing a vertical line tangent to forehead at the glabella and tangent to the chin at the pogonion so that a line drawn along the nasal dorsum intersects it.



Figure 4: Nasomental angle formed by a line drawn through the nasal dorsum intersecting a line drawn from the nasal tip to soft tissue chin at the pogonion.

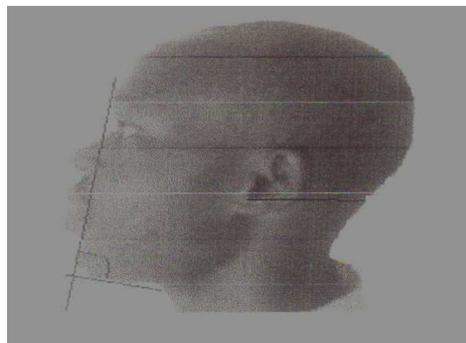


Figure 5: Mentocervical angle formed by a vertical line tangent to forehead passing at glabella and second line intersecting tangent to the chin at pogonion.

RESULTS

Table 1 shows the aesthetic angles for Urhobo males while Table 2 shows that for Urhobo females. From the two tables it can be seen that the Urhobo males have higher Nasofacial ($p > 0.05$) and Nasofrontal ($p < 0.05$) angles than the Urhobo females. The Urhobo females have higher Nasomental ($p > 0.05$) and Mentocervical ($p < 0.05$) angles than the Urhobo males. The Urhobo subjects have a mean Nasofrontal angle of 116.28 degrees ($^{\circ}$), Nasofacial angle of 38.5 $^{\circ}$, Nasomental angle of 127.2 $^{\circ}$ and Mentocervical angle of 87.35 $^{\circ}$.

Table 1: Aesthetic facial angles of Urhobo males

Angles	Male			
	Minimum ($^{\circ}$)	Maximum($^{\circ}$)	Mean($^{\circ}$)	Standard Deviation
Nasofrontal	120.0	147.0	132.0	75.0
Nasofacial	29.0	48.0	39.6	5.0
Nasomental	105.0	138.0	127.0	89.0
Mentocervical	70.0	96.0	84.8	65.0

Table 2: Aesthetic facial angles of Urhobo females

Angles	Female			
	Minimum ($^{\circ}$)	Maximum($^{\circ}$)	Mean($^{\circ}$)	Standard Deviation
Nasofrontal	112.2	145.0	100.56	7.6
Nasofacial	28.0	45.0	37.4	4.9
Nasomental	105.0	138.0	127.4	8.9
Mentocervical	70.0	106.0	89.9	8.2

Table 3: Comparison of aesthetic facial angles of the Urhobos and other tribes and races

Angles	Urhobo ($^{\circ}$)	Itsekeri ($^{\circ}$)	Ibo ($^{\circ}$)	Northern America ($^{\circ}$)	Himachali ($^{\circ}$)
Nasofrontal	116.28	132.45	134.1	122.5	134.0
Nasofacial	38.5	39.3	38.95	35.0	33.26
Nasomental	127.2	128.95	125.65	126.0	128.0
Mentocervical	87.35	84.77	85.6	87.5	99.88

DISCUSSION

The higher values shown by the Urhobo females in their Nasomental and Mentocervical values and the lesser values in the Nasofrontal and Nasofacial angles compared to the male implies that the females have more protruded nose, less prominent glabella and bigger chin on their faces compared to the males.

The documented significant gender difference seen in previous studies was demonstrated in our sampled population. A cephalometric study done on Mexicans showed significant gender differences [18]. . When comparing the cephalometric data of Iowan and North Mexicans

significant difference was seen between the boys and the girls in Northern Mexico [19]. The gender differences seen in this study was also seen in another similar study that involved Ibos in Nigeria [20] but not among the Itsekiris [21].

The aesthetic angles in the Urhobos are different from those of the Itsekiris [21], Ibos [20], North Americans and Himachalians [14] as shown in Table 3. Pacinato et al. stated that a nasofrontal angle of 115° to 130° and nasomental angle of 120° to 132° are expected [22]. In the subjects evaluated in this study we found values of 116.28° and 127.2° , respectively. Pacinato et al. also stated that the ideal nasofacial angle is 36° [22] but the mean angle in this study is 38.5° .

CONCLUSION

This photometric study determined the aesthetic angles of Urhobos in Nigeria. This study has therefore shown that aesthetic angles using photometric analysis may be used as a means of racial and ethnic identification. They may also serve as tools in gender differentiation. Further studies should be done on other ethnic groups in Nigeria and other countries to allow for comparison.

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