NASAL MEASUREMENTS AMONG MAJOR ETHNIC GROUPS IN NIGERIA

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ABSTRACT

Background: Parameters in anthropometry, including height, weight, length, thickness and widths of various part of the body vary amongst races and even among ethnic group of the same race. This study of nose dimensions in normal adult Nigerians, was carried out at University College Hospital, Ibadan. Nigeria between January and March 2001.

Objective: To provide baseline measurements of nose dimensions and standard nostril type for major ethnic groups in Nigeria.

Methods: The subjects were 300 adult Nigerians selected by convenience sampling method, composed of 169 (56.3%) males and 131 (43.7%) females. Two hundred and seventeen (72.3%) were Yorubas, 43 (14.3%) Ibos, 13(4.3%) Hausa/Fulanis and 27(8.9%) were other tribes. Nostril type was assigned according to the inclination of the medial longitudinal axis of the nostril following Topinard system. Other measurement includes length of the nose and 5 soft tissue nose measurements.

Results: The mean length of the nose found in the study was 46.6(4.9) mm, mean width 44.4(5.0)mm and the most common nostril type was Nostril type VI(57%) A significant tribe difference in the length of the nose, width of the nose and nasal tip protrusion was observed. Hausa/Fulanis having mean length of nose 49.7(9.0) mm, Yorubas had 46.2(4.9) mm. ($P<0.05$).

Conclusion: Similar study on Nigerians has not been reported in the literature; therefore, this study provides a baseline value of nose dimension among the major ethnic groups.

Keywords: ***Nose parameter, Nasal Measurements, Anthropometry, Nostril type.***

INTRODUCTION

The nose is a unique anatomic unit comprising a combination of soft, cartilaginous and bony tissues. It is the most prominent of facial features, extremely important to the patient and challenging to the surgeon who does nasal reconstruction.[1] The nose is in the shape of pyramid, the upper two fifths comprise the bony part, the upper narrow end joins the forehead at the root or bridge of the nose, and its free edge at the lower point is termed tip of the nose. The two orifices, the nostrils, are separated by a skin cartilage septum known as the columella. The lateral surface ends below in a rounded eminence, the ala nasi. There is bony/cartilaginous structure the septum in the midline dividing the nasal fossa into two cavities or fossae, each nasal fossa is in turn divided into three measures by three turbinates on the lateral walls of nasal cavities. The skin over the external nose is thin and loosely attached in its upper half, but in its lower portion it is intimately bounded to the lower lateral cartilage. The skin continues into the nostrils to supply lining to nasal vestibule.

The shape and size of the nose varies greatly amongst races and even among ethnic group of the same race. The white race has a narrow, long, high nose (leptorrhine), blacks have wide, flat noses (Platyrrhine) and orientals have nose with intermediate measurement (mesorrhine). [2, 3] Nostrils were classified into seven types according to the inclination of the medial longitudinal axis.[4] Reports of successful reconstructive surgery for various types of nose defects abound in the literature. Most of these have been judged on purely subjective basis or photogrammetric or cephalometric analysis[5]. Objective assessment based on direct measurements was found to be more reliable.[5] However, there have been few published studies of nose parameters in blacks and none was reported on Nigerians. The present study has therefore been undertaken to obtain normal values of nose parameters among the major ethnic groups in Nigeria.

SUBJECTS AND METHODS

The study group consisted of 300 selected adult Nigerians (18 years and above) by convenience sampling of cases[6] who attended the ENT Clinic of University College Hospital, Ibadan, between January and March 2001. Non Nigerian or adults with noticeable nose anomalies are excluded from the study. Informed consent of the subject was taken.

The following measurements were carried out on each subject: Length of the nose (LN), width of the nose (WN), Nasal tip protrusion (NTP) width of the columella (WC), Length of the columella (LC), inclination of the medical longitudinal axis of the nostril (IMLA).

Measurements were obtained using sliding caliper, transparent protractor, measuring ruler. The Nasal measurements were carried out with the patients lying in supine position on an examination table. The inclination of the medial longitudinal axis of the nostril were measured with patients head in recumbent position and with the midfacial plane in vertical position. The top and bottom points were marked on the skin of the nostrils and the inclination of line connecting the top and bottom points of the medial longitudinal axis were measured by placing the zero mark of the protractor on the point at the bottom of the nostrils while holding the protractor horizontal. The top point of the nostril indicates the degree of the inclination on the scale Fig. 1, 2. The linear measurements were measured using sliding calipers and measuring rulers. The data were analysed using SPSS version 11.0 software programme, the results were presented in tabular forms and diagrams, the statistical test, t-test, chi-square, Analysis of variance(ANOVA) were applied where appropriate, level of significance was taken to be $P<0.05$.

RESULTS

One hundred and sixty nine (56.3%) were males and 131 (47.3%) were females, comprising 217 (72.3%) Yorubas, 43 (14.3%) Ibos, 13(4.3%) Hausa/Fulanis and 27(8.9%) were other tribes, comprising Ibibio, Efik, Itsekiri, Kalabari, Idoma and Igala. The mean age of the study group was 32 years with age range of 18-70years, mean height was 1.65m with range of 1.43-1.9m.

Nasal Measurement: The mean (±standard deviation) length of the nose found in the study was 46.6(5.2)mm. In males it was 46.9 (5.5)mm and in females, 46.2(4.9)mm. The mean of the nasal tip protrusion in males was 19.1(2.6)mm and in females, 18.8 (5.2)mm, there was no significant difference in the measurements between the two sexes ($P>0.05$). The mean width of the nose was 44.4 (5.0)mm, in males was 45.3 (5.1)mm and females 43.2(4.6)mm. There was significant difference in measurements between the sexes ($P<0.05$). The mean length of the columella was 9.6(2.0)mm, width of the columella 9.6(1.5)mm. There was no significant difference in measurements between the two sexes ($P>0.05$) Table 1. A significant tribe difference in the length of the nose, width of the nose and nasal tip protrusion was observed in the study group. Hausa/Fulanis had a mean length of the nose 49.7(9.0)mm and Yorubas 46.2(4.9)mm ($P<0.05$). The Ibos and Hausa/Fulanis had mean width of the nose 45.1(4.6)mm and 37.2(6.1)mm respectively ($P<0.05$). The mean nasal tip protrusion amongst Yorubas and Hausa/Fulanis was 18.6(3.8)mm and 21.5(2.6), respectively ($P<0.05$). This showed that Ibos had wider nose, Hausa/Fulanis had longer narrower and more protruding nose in the study group. However, the mean columella width 10.2(1.5)mm in Hausa/Fulanis

was found to be greater than those observed in other tribes (P<0.05). Table 2.

Nostril type: The nostrils were symmetrical in all subjects in the study group. One hundred and seventy one (57%) of the study group had nostril type VI, 70(23.3%) had type V,32 (10.7%) type VII, 14(4.7%) type IV, 13 (4.3%) had type III and none in the study group with either type I or type II nostrils. There was no significant sex difference in the distribution of the nostril type (P>0.05) table 3. The nostril type found common amongst Yorubas and Ibos was nostril type VI, 137 (63.2%) and 22 (51.2%) respectively. Type III nostril was common among Hausa/Fulanis (38.4%) whereas nostril type IV was common among the 'other' tribes. Significant tribe difference in the nostril type was found (P<0.05) table 4, Relationship was found between the nasal measurements and the nostril type. Nostril type IV was found with the longer width of the nose 47.3 (5.8)mm. The nasal tip protrusion, length of the columella and width of the columella decreased gradually from nostril type III through type VII except the width of the columella which increased in type VII. The length of the nose significantly decreased (P<0.05) from type III through type VII. Table 5.

TABLE 1: NASAL MEASUREMENT BY SEX

Measurement(mm)	Sex	Mean	SD	P.value
Length of the nose(LN)	Male	46.9	5.5	0.2
	Female	46.2	4.9	
Width of the nose(WN)	Male	45.3	5.1	0.001*
	Female	43.2	4.6	
Nasal tip protrusion(NTP)	Male	19.1	2.5	0.5
	Female	18.8	5.1	
Length of the columella (LCR)	Male	9.9	2.0	0.9
	Female	9.2	1.9	
Width of the columella(WC)	Male	9.8	1.3	0.2
	Female	9.7	1.8	

169 males, 131 females, *significant values.(ANOVA)

TABLE 2: NASAL MEASUREMENT BY TRIBE

Measurement(mm)	Tribe	N	Mean	SD	P.value
Length of the nose(LN)	Yoruba	217	46.2	4.9	0.02*
	Ibo	43	46.4	4.5	
	Hausa/Fulani	13	49.7	9.0	
	Others	27	48.7	5.9	
Width of the nose(WN)	Yoruba	217	44.9	4.4	0.001*
	Ibo	43	45.1	4.6	
	Hausa/Fulani	13	37.2	6.2	
	Others	27	42.1	6.4	
Nasal tip protrusion(NTP)	Yoruba	217	18.6	3.8	0.005*
	Ibo	43	19.0	1.9	
	Hausa/Fulani	13	21.5	2.6	
	Others	27	20.2	4.5	
Width of the columella(WC)	Yoruba	217	9.8	1.4	0.5
	Ibo	43	9.4	2.4	
	Hausa/Fulani	13	10.2	0.8	
	Others	27	9.6	1.0	
Length of the columella (LC)	Yoruba	217	9.4	1.8	0.4
	Ibo	43	9.9	2.8	
	Hausa/Fulani	13	12.1	2.6	
	Others	27	10.2	2.4	

***Significant values. (ANOVA)**

TABLE 3: NOSTRIL TYPE BY SEX

Nostril type	Male	Female	Total	Inclination
	N 169 (56.3%)	N 131 (43.7%)	N 300(100%)	(Degrees)
III	7(50.0)	7(50.0)	14(4.7)	40-54
IV	9(69.2)	4(30.8)	13(4.3)	0
V	36(51.4)	34(48.6)	70(23.3)	25-39
VI	102(59.6)	69(40.4)	171(57.0)	10-24
VII	15(46.9)	17(53.1)	32(10.7)	(-40)-(10)

Chi-square 3.72, df = 4, P = 0.4

Note: None in the study group was found with either Nostril type I or II.

TABLE 4: NOSTRIL TYPE BY TRIBE

Nostril type	Yorubas (N=217) N(%)	Ibos (N=43) N(%)	Hausa/Fulanis (N=13) N(%)	Others (N=27) N(%)
III	4(1.8)	1(2.3)	5(38.4)	4(14.8)
IV	10(4.6)	0(0.0)	1(7.7)	2(7.4)
V	41(18.9)	15(34.9)	3(23.1)	11(40.1)
VI	137(63.2)	22(51.2)	31(23.1)	9(33.4)
VII	25(11.5)	5(11.6)	1(7.7)	1(3.7)

Chi-square 71.11, df = 16, P < 0.05

Note: None in the study group was found with either Nostril type I or II.

TABLE 5: NASAL MEASUREMENT ACCORDING TO NOSTRIL TYPE IN THE STUDY POPULATION

		NASAL MEASUREMENTS(mm)				
Nostril Type	**N**	**Nasal Tip Protrusion (NTP)**	**Width of the Nose (WN)**	**Width of Columella (WC)**	**Length of Right Columella (RCR)**	**Length of sthe Nose (LN)**
III	14	21.2±3.3	37.8±7.7	9.9±0.4	12.6±2.4	53.6±7.6
IV	13	19.0±2.5	47.3±5.8	9.8±0.9	9.2±2.5	45.6±7.8
V	70	20.5±5.4	42.4±4.3	9.5±1.5	10.5±1.8	47.9±4.7
VI	171	18.3±3.3	45.3±4.5	9.5±1.4	9.5±1.5	46.0±4.6
VI	32	18.0±2.5	45.3±3.4	11.8±1.1	7.2±1.3	44.5±3.4
P value	0.000*	*0.000	*0.000	*0.000	*0.000	*0.000

- **Significant values. (ANOVA)**

DISCUSSION

Parameters in anthropometry, including height, weight, length, thickness and widths of various part of the body vary amongst races and even among ethnic group of the same race[5]. These measurements also differ among different age groups and between the two sexes. [7] In this study, men were found to have wider nose, and no sex difference was found in the length of the nose which was in contrast to the report by Begg et al [8] who found that men had longer and wider nose than women. This could not be explained by virtue of height of men compared to women, Farkas et-al [5] in their study attributed genetic factor as most probable factor responsible for the size, shape and length of the nose.

Nostril type VI was found to be common (57%) in the study group and amongst Yoruba ethnic group (63.2%) and Ibos (51.2%). This is similar to the findings of Farkas et al [5] who found that 50% of the Negros in their study had nostril type VI. Nostril type IV was found to have greater width not nostril type VI as reported by Farkas et al, [5] this could be due to the configuration of the alae in this type of nostrils in this study which are usually full, curved with relatively thick skin. Nostril types I, II and III found common among Caucasians are narrower and more protruding, none in this study was found with either Nostril type I or II. Nostril type III was common among Hausa/Fulani with similar configuration as that reported by Farkas et al. [5] The mean length of the nose (46.6mm) found in this study is shorter than found in Caucasian (55mm) as reported by width P.J.[9] Flaring of the alar nasi is the characteristic of Negroid nose as reported by Falces et al.[10] this is more pronounced in Nostril type VII which was found in 11.5% of Yorubas and Ibos in this study. Yorubas were found to have a fair distribution of the Nostril type compared to all other tribe, this could be due to the large population size of this ethnic group in this study.

Conclusion, Similar study on Nigerians has not been reported in the literature; therefore, this study provides a baseline value of nose dimension among the major ethnic groups in Nigeria. Further assessment of the size of the nose, nostril type and a large population of Nigerians of various ethnic groups would help to further highlight the variations characteristics of Negroid nose. Studies that would include the lips, mandible other facial/nasal measurements would be helpful in planning nasal reconstruction and rhinoplasty on Nigerians.

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