

Nasal Indices among Bini Adolescents in Edo State, Nigeria

Índices Nasales entre los Adolescentes de Benin en el Estado de Edo, Nigeria

Eboh, D. E. O.

EBOH, D. E. O. Nasal indices among Bini adolescents in Edo state, Nigeria. *Int. J. Morphol.*, 29(4):1231-1234, 2011.

SUMMARY: Human nose occurs in many shapes and sizes and ethnic influences may result in different appearances of the nose. The classification of nose shapes can be based on nasal indices. This study was undertaken to determine the nasal indices of the Binis, between the ages of 12 and 15 years in order to classify the nose types. The study sample consisted of 200 subjects; 100 males and 100 females who were sampled purposively, from 14 secondary schools that were randomly selected. Nasal height and nasal width were measured in mm, using digital vernier caliper (Mitutoyo, Japan). The data obtained were subjected to statistical analysis using descriptive statistics and independent sample t test. $P \leq 0.05$ is considered statistically significant. Descriptive statistics showed minimum and maximum nasal indices to be 83.10 and 121.89 in males and 77.07 and 137.24 in females. T-test revealed mean nasal indices were 99.13 and 99.27 for males and females respectively, and the difference is statistically not significant at 0.05 levels. The mean nasal indices of 99.13 and 99.27 fall under the platyrrhine type of nose. The distribution of the nose types showed platyrrhine to be 92% (male = 48%; female = 44%) and the dominant type among the Binis. Mesorrhine was 8% (male = 2%; female = 6%). The least was leptorrhine that was not present among the Bini adolescents. Its relevance may be found in forensic and clinical practice.

KEY WORDS: Nose shapes; Nasal indices; Human identification; Nigeria.

INTRODUCTION

The part of the human nose that protrudes forwards from the face is the external nose (Sinnatamby, 2006). It is a pyramidal structure located in the midline of the midface and attached to the facial skeleton. Its upper angle or root is continuous with the forehead, and its free tip forms the apex which projects anteriorly. Its base contains two ellipsoidal apertures, the external nares or nostrils, which opens only to its inferior surface separated by the nasal septum and columella. The shape of the external nose is variable (Standring, 2008), and is determined by the ethmoid bone and the nasal septum, which consists mostly of cartilage and which separates the nostrils. The anterior nasal spine is the thin projection of bone at the midline on the lower nasal margin, holding the cartilaginous center of the nose (Wikipedia, 2011). The nasal spine bone is a late adaptation and may have reinforced pre-existing cartilage which does not fossilize. The large noses of Neanderthals have been theorized as an adaptation to cold, dry areas, or possibly as a means of shedding heat within hot and humid regions (Finlayson, 2004).

The human nose can be found in many shapes and sizes and ethnic influences can result in different appearances of the nose (Heidari *et al.*, 2009). The human nose can be

classified into the following types (Kashmira, 2011) morphologically: The Roman or Aquiline Nose is convex in shape, like a hook. It is also known as 'hooknose' because of its shape. The Greek or Straight Nose is perfectly straight with no curves or hooked like shape. The Nubian Nose has wide nostrils. It is generally a little narrow at the top, thick and broad at the middle and wide at the end. The Hawk Nose is so called because it is very convex, to the extent that it almost looks like a bow. It is very thin and sharp as well. Snub Nose is quite short in length and is neither sharp, nor hook like nor wide. The turn up Nose is also called as the Celestial nose. It is so called because it runs continuously from the eyes towards the tip.

Furthermore, noses can be classified as leptorrhine, mesorrhine or platyrrhine, based on nasal indices. In the living, if the nasal index falls under 70, the nose is said to be leptorrhine (narrow-nosed), if over 85 the nose is said to be platyrrhine (broad-nosed) (Knussman, 1988). The nasal index is the width of the nose divided by the height of the nose, multiplied by 100. This is the proportion the width of the nose bears to its height. In the living, the height of the nose is measured from the point overlying the nasion

(paranasion) to the junction of the septum with the upper lip (subnasale). The breadth (or width) of the nose is the distance between the alae. On a skull, the height of the nose is measured from the nasion to the anterior nasal spine; the breadth is the greatest distance between the edges of the pyriform aperture (Bruitjes, 2004). There is strong relationship between climate and body weight, body proportions, skin pigmentation and, nose shape, expressed as the nasal index (Carey & Steegmann, 1981).

Various studies on nasal indices have been conducted at different parts of the globe, including Nigeria (Risely, 1969; Daniel, 2000; Akpa *et al.*, 2003; Mulchland, 2004; Oladipo *et al.*, 2007; Oladipo *et al.*, 2009; Oladipo *et al.*, 2010; Eboh & John, 2011). The literature is lacking in the sense that studies on nasal index, to the best of my knowledge, have not been carried out among the Bini adolescents, in Edo state, Nigeria. This gap in literature is what this study intends to fill. Therefore, the purpose of this study is to determine the nasal indices of the Binis, between the ages of 12 and 15 years in order to classify the nose types. The present study will provide a normative data on nasal indices, which will be relevant in forensic medicine, physical anthropology and in surgery of the face, especially rhinoplastic surgery.

MATERIAL AND METHOD

The study sample consisted of 200 subjects; 100 males and 100 females who were sampled purposively, from 14 secondary schools that were randomly selected. The age of the subjects ranged from 12-15 years. Subjects whose parents and grandparents were Binis by tribe, who had had no trauma or surgery of the face or nose, no history of cleft lip or palate were included in the study, otherwise they were excluded. Prior to the study, permission to carry out the study was obtained from the respective head of schools. In addition,

the purpose of the study was explained to the students and only those who willingly volunteered participated. Accordingly, the approval of the Research Ethics Committee of the College of Health Sciences, Delta State University was obtained.

Nasal height (NH) was measured in mm as the straight distance from the nasion to the subnasale, using digital vernier caliper (Mitutoyo, Japan). Nasal width was measured in mm as straight distance at right angle to the NH from ala to ala, using digital vernier caliper (Mitutoyo, Japan). To reduce technical error of the measurements, each measurement was taken thrice and the average taken. To prevent inter-observer error, only one observer carried out the measurements. Measurements were taken with the subjects sitting relaxed in an anatomical position. Nasal index was calculated as $NW/NH \times 100$. The study was conducted between November, 2010 and January, 2011. The data obtained were subjected to statistical analysis using descriptive statistics and independent sample t test, using Microsoft Excel windows 2007. $P \leq 0.05$ is considered statistically significant.

RESULTS

Descriptive statistics showed minimum and maximum nasal indices to be 83.10 and 121.89 in males and 77.07 and 137.24 in females (Table I). T-test revealed mean nasal indices were 99.13 and 99.27 for males and females respectively, and the difference is statistically not significant at 0.05 levels. The mean nasal indices of 99.13 and 99.27 fall under the platyrrhine (broad nose) type of nose. The distribution of the nose types showed platyrrhine (broad nose) to be 92% (male = 48%; female = 44%) and the dominant type among the Binis. Mesorrhine was 8% (male =2%; female = 6%). The least was leptorrhine (fine nose) that was not present among the Bini adolescents (Table II).

Table I. Descriptive statistics of nasal indices of the Binis (n= 100 males; n=100 females).

Measurement (mm)	Mean	SD	Minimum	Maximum
NI in male	99.13	9.26	83.1	121.89
NI in female	99.27	11.67	77.07	137.24

Table II. Frequency (percentage) of nose shapes of the Binis.

Nose shape	Frequency (%)		
	Total	Male	Female
Leptorrhine	0 (0)	0 (0)	0 (0)
Mesorrhine	16 (8)	4 (2)	12 (6)
Platyrrhine	184 (92)	96 (48)	88 (44)

DISCUSSION

The present study indicated that the predominant nose shape is platyrrhine (broad nose) based on the mean nasal indices of 99.13 and 99.27 for males and females respectively. Literature has it that the platyrrhine type of nose is typically African (Risely) and is associated with hot moist climate (Thompson & Buxton, 1923). The present study is a confirmation of the literature as Binis have mainly platyrrhine type of nose. Literature also have it that not all Africans are platyrrhine (Oladipo *et al.*, 2009; Risely). The present study also corroborates this as 16% of the population studied has mesorrhine type of nose.

Eboh & John conducted a study on the morphological assessment of face and nose shapes among the Ukwuani ethnic group in Delta state, Nigeria. They observed the mean nasal index was 97.47 ± 12.88 in males and 98.07 ± 8.37 in females and the difference was statistically not significant. They noted the dominant type of nose was platyrrhine (88.3%) while the rarest type of nose shape was leptorrhine (0%). These findings are supported by the present study, although the Binis show slightly higher nasal indices compared with the Ukwuanis.

In a related study carried out in Port-Harcourt, Nigeria, Fawehinmi & Ligha (2010) observed that in all the age groups studied between 2 – 18 years, all the healthy subjects had nasal indices varying from 85.49 – 91.63 (platyrrhine), except in healthy female subject 15 – 18 years that had nasal index of 83.69 (mesorrhine). The result of our study agrees with this as the significant proportions of the two populations are platyrrhine. The results of the two studies are also similar as a small proportion of the two populations are mesorrhine.

In another study on nasal indices carried out among the Epkeyes and Ikwere in River State, Nigeria (Oladipo *et al.*, 2010), they noted that the Ikpeyes had nasal indices of 93.72 (males) and 88.99 (females), while the Ikwere have nasal indices of 93.17 (females) and 84.81 (males). Except for the Ikwere males that are mesorrhine, the Ikpeyes and Ikwere are platyrrhine. The present study is mainly platyrrhine with a very small percentage as mesorrhine.

Oladipo *et al.* (2007) conducted a study on nasal indices among the Igbo, Yoruba and Ijaw ethnic groups in Nigeria. They observed the nasal indices to be distributed as follows: Igbos=94.1 with males (95.9) and females (90.8); Yorubas=89.2 with males (90.0) and females (88.1); and Ijaws=96.4 with males (98.6) and females (94.2). These

three Southern Nigerian ethnic groups have platyrrhine type of nose based on their nasal indices. The differences in nasal indices between males and females in the respective ethnic groups are statistically significant. The present study corroborates platyrrhine type of nose as the dominant nose type in this part of the world. Nevertheless, our study differs as there was no statistically significant difference between males and females.

In a study by Oladipo *et al.* (2009), nasal indices of 86.38 (platyrrhine) and 81.86 (mesorrhine) were observed among the Andonis and Okrikas respectively of Rivers State, Nigeria. In another study, Oladipo *et al.* (2010) observed mean nasal index for males and females were 99.83 and 97.79 respectively for the adult Ijaws of Nigeria. Oladipo *et al.* (2011) also carried out a study on nasal indices among the Omoku people of Rivers state, Nigeria. Their findings were that the nasal index was 86.09 in males and 90.16 in females. These values correspond to the platyrrhine type of nose. The present study is consistent with these findings.

Heidari *et al.* in southeast Iran, conducted an anthropometric study of external nose on individuals aged 18 – 25 years and noted that the commonest type of nose was leptorrhine (fine nose), with 55.5% and 98.5% in the Sistani and Baluch groups, respectively. The rarest type was platyrrhine (broad nose) with 0% in both groups. The results of our study are at variance with this study. This variation could be ascribed to the differences in genetic and geographic location between Southern Iran and Southern Nigeria.

In conclusion, the relevance of this study in forensic medicine, physical anthropology and rhino plastic surgery cannot be overemphasized.

ACKNOWLEDGEMENTS

The author wishes to express thanks to Prof. P.S. Igbigbi of the Department of Anatomy and Cell Biology, Delta State University, Abraka, Nigeria, for reviewing the manuscript. I am indeed grateful to some of the 400 level students of Department of Human Anatomy and Cell Biology, Faculty of Basic Medical Sciences, College of Health Sciences, Delta State University, Abraka, Nigeria (Oviosun Augustine, Erhuvwu Onodarho, Oyem John), who played assistant role during the data collection.

EBOH, D. E. O. Índices nasales entre los adolescentes de Benin en el estado de Edo, Nigeria. *Int. J. Morphol.*, 29(4):1231-1234, 2011.

RESUMEN: La nariz humana presenta muchas formas y tamaños y las influencias étnicas pueden dar lugar a diferentes apariencias de la nariz. La clasificación de las formas de la nariz puede estar basada en los índices nasales. Este estudio determinó los índices nasales de los adolescentes de Benin, entre las edades de 12 y 15 años con el fin de clasificar los tipos de nariz. La población estudiada consistió en 200 sujetos, 100 hombres y 100 mujeres que se tomaron muestras provenientes de 14 escuelas secundarias que fueron seleccionadas al azar. La altura y el ancho nasal se midieron en milímetros utilizando un caliper digital (Mitutoyo, Japón). Los datos obtenidos fueron sometidos a análisis estadístico descriptivos y la prueba de t para muestras independientes. Un valor $p \leq 0,05$ se consideró estadísticamente significativo. Los estadísticos descriptivos mostraron índices nasales mínimo y máximo de 83,10 y 121,89 para hombres y 77,07 y 137,24 para mujeres. La prueba T reveló índices nasales promedios de 99,13 y 99,27 para hombres y mujeres respectivamente, y la diferencia no fue estadísticamente significativa. Los índices nasales promedio de 99,13 y 99,27 correspondieron al tipo de nariz platirrino. La distribución de los tipos de nariz mostró el tipo platirrino fue dominante entre los adolescentes de Benin (hombres = 48%, mujeres = 44%). El tipo mesorrino se observó en el 8% (hombres = 2%, mujeres = 6%). El menor fue el tipo leptorrino, que no estaba presente entre los adolescentes de Benin. Su relevancia se puede encontrar en la práctica forense y clínica.

PALABRAS CLAVE: Forma de la nariz; Índices nasales; Identificación humana; Nigeria.

REFERENCES

- Akpa, A. O. C.; Ugwu, C.; Maliki, A. O. & Maliki, S. O. Morphometric study of the nasal parameters in Nigerian Igbos. *J. Exp. Clin. Anat.*, 2(2):24-5, 2003.
- Bruinjtes, Tj. D. *Nose Shape, Climate and Variation*, 2004. Available in: http://www.nvfa.nl/attachment/fame12_2004.pdf
- Carey, J. W. & Steegmann, A. T. Jr. Human nasal protrusion, latitude, and climate. *Am. J. Phys. Anthropol.*, 56(3):313-9, 1981.
- Daniel, B. *Racial Anthropology and Genetics of the Lebanese*, 2000. Available in: www.nasalindexoflebanese.com
- Eboh, D. E. O. & John, E. A. Morphological assessment of face and nose shapes among the Ukwuanis of Delta state, Nigeria. *J. Exp. Clin. Anat.*, 10(1):4-8, 2011.
- Fawehinmil, H. B. & Ligha, A. E. Subnasale to Gnathion Distance and Nasal Index of Children with Homozygous Sickle Cell Disease in Port-Harcourt. *Eur. J. Gen. Med.*, 7(2):197-202, 2010.
- Finlayson, C. *Neanderthals and modern humans: an ecological and evolutionary perspective*. Cambridge, Cambridge University Press, 2004. p.84.
- Heidari, Z.; Mahmoudzadeh-Sagheb, H.; Khammar, T. & Khammar, M. Anthropometric measurements of the external nose in 18-25-year-old Sistani and Baluch aborigine women in the southeast of Iran. *Folia Morphol.*, 68(2):88-92, 2009.
- Kashmira, L. *Different Types of Noses*, 2011. Available in: <http://www.buzzle.com/articles/different-types-of-noses.html>
- Knussman, R. *Anthropologie: Handbuch der Vergleichenden Biologie des Menschen*. Stuttgart, Gustav Fischer Verlag, 1988. Vol.1.
- Mulchland, C. *Scythic Origin of the Raiput Race*, 2004. Available in: http://rajputana.htmlplanet.com/scy_raj/scy_raj.html
- Oladipo, G. S.; Okoh, P. D.; Akande, P. A. & Oyakhire, M. O. Anthropometric study of some craniofacial parameters: head circumference, nasal height, nasal width and nasal index of adult Omoku indigenes of Nigeria. *Am. J. Sci. Ind. Res.*, 2(1):54-7, 2011.
- Oladipo, G. S.; Olabiyi, A. O.; Oremosu, A. A. & Noronha, C. C. Nasal indices among major ethnic groups in Southern Nigeria. *Sci. Res. Essay*, 2(1):20-2, 2007.
- Oladipo, G. S.; Eroje, M. A. & Fahwehinmi, H. B. Anthropometric comparison of the nasal indices between the Adoni and Okrika ethnic groups of Rivers State, Nigeria. *Int. J. Med. Sci.*, 1(4):135-7, 2009.
- Oladipo, G. S.; Oyakhire, M. O. & Ugboma Henry, A. A. Anthropometric Studies of Nasal Indices of the Ekpeye and Ikwerre Ethnic Groups in Nigeria. *Asian J. Med. Sci.*, 2(4):167-9, 2010.
- Risely, H. H. *The People of India*. 2nd Edn. Crooke, W. (Ed.). Delhi, Oriental Books Reprint Corporation, 1969. pp.395-9.
- Sinnatamby, C. S. *Last's Anatomy: Regional and Applied*. 11th Ed. Edinburgh, Churchill Livingstone, 2006. p.385.
- Standring, S. *Gray's Anatomy: The Anatomical basis of Clinical practice*. 40th Ed. London, Elsevier, 2008. p.547.
- Thomson, A. & Buxton, L. H. D. Man's nasal index in relation to certain climatic conditions. *J. R. Anthropol. Inst.*, 59:92-122, 1923.
- Wikipedia. Human nose, 2011. Available in: http://en.wikipedia.org/wiki/Human_nose

Correspondence to:

Dr. Dennis Erhisenebe O. Eboh
Department of Human anatomy and Cell Biology
Faculty of Basic Medical Sciences
College of Health Sciences, Delta State University
P.M.B. 1, Abraka
NIGERIA

Received: 23-04-2011

Accepted: 16-08-2011

Email: drebohdennis@yahoo.com