



ijcrr

Vol 04 issue 15

Category: Research

Received on:19/05/12

Revised on:23/05/12

Accepted on:27/05/12

ANTHROPOMETRIC STUDY OF THE NASAL PARAMETERS OF THE ADULT MEWARIS OF SOUTHERN RAJASTHAN

Pooja Gangrade¹, Kalpana Gupta², Hitesh Babel¹

¹Dept of Anatomy, Geetanjali Medical College, Udaipur

²Dept of Skin and VD, Geetanjali Medical College, Udaipur

E-mail of Corresponding Author: gangradepooja@rediffmail.com

ABSTRACT

The nasal architecture forms one of the most important aspects while assuming the facial aesthetics. Several authors in the past have considered nasal anthropometry to be one of the best clues to racial origins and also of gender differentiation. The purpose of the present study was to analyze the presence of sexually dimorphic morphometric parameters of the nose in the adult Mewari population of southern Rajasthan. The study involved 1000 adult Mewari volunteers, 500 males and 500 females, with their ages ranging between 18-50 years. A total of ten parameters were recorded by direct anthropometry, of these ten parameters analyzed, significant differences between man and women were found in seven of them. The data thus assimilated by the above study, reinforces the need for such nasal morphometric parameters in our populations, which are useful in various disciplines of medicine and surgery like rhinoplasty, facial reconstructive surgeries and forensic anthropology.

Keywords: sexual dimorphism, rhinoplasty, nose, anthropometry.

INTRODUCTION

Anthropometry is a series of systematically undertaken measuring technique that expresses quantitatively the dimensions of the human body and skeleton. It includes measuring the whole body to individual parts : nose, face, extremities etc.

The human face is used for expression, appearance and identity amongst all the rest. On evaluation of the face, one of the things that often calls for the attention are the set of three facial features: the lips, the nose and the chin¹. The extent of the attractiveness of the face and the beauty depends on the reciprocal proportion and aesthetic harmony of the above stated features².

Nasal anthropometry is considered one of the best clues to racial origin. This evaluation of the nose stems from the neoclassical canons of

facial proportions developed by artists and anatomists of the 17th and 18th centuries.

Concept of beauty has changed from time to time it is thus apparent that beauty acceptable for one culture may not be the same for the other. Thus notion of a single aesthetic standard is grossly inadequate.

The growing demand for cosmetic rhinoplasty³ reflects the importance of a beautiful nose. Thus, a new model of aesthetic standard and beauty unique to a particular ethnic group is required and it becomes surgeon's responsibility to maintain core ethnic features while achieving cosmetic enhancements. The above standards are also being used in forensic facial reconstructions^{4,5}. It is a well documented fact that during facial identification the facial approximate is more accurate when tissue thickness tables and external anatomical parameters like nose, lips and ears of the

population are known. Researchers have described the importance and applications of nasal forms time and again, not only for technical purposes, but also for aesthetic appreciations that are influenced by culture^{6,7,8}. Hence, the present study was undertaken to formulate a baseline standard aesthetic record of the nasal parameters of the people in and around the Mewar region of southern Rajasthan in India.

MATERIALS AND METHOD

The present study was carried out in the local communities of the Udaipur district in Rajasthan. The study was carried out on 1000 adult volunteers, who were selected at random from the local communities, comprising of 500 female and 500 males with their age ranging from 18-50 years. Subjects with deviated nasal septum, trauma and congenital abnormalities of the nose and face were excluded.

Measurements were taken with aid of sliding vernier calipers (with least count of 0.001/mm.), scientific calculator and data sheet. Subjects were told to sit upright in a relaxed mood with head in the anatomical position while taking measurements. A single reading by the same investigator was taken to avoid bias. All participants declared to have at least three generations of Mewar ancestry. To obtain a vision of the nasal base, the volunteer was positioned with the neck in extension, so that pronasion and glabella were in the same plane.

1. Distance between endocanthion ($EN_L - EN_R$): describes the distance between left and right endocanthion points in a patient's anatomical position.
2. Bony nasal width ($B_L - B_R$): corresponds with the width between the nasal bones of left and right side.
3. Interalar distance ($AL_L - AL_R$): it corresponds to the distance between left and right alar points, which corresponds to the nasal wing contour in the most convex area.

4. Bialar base distance ($BL_L - BL_R$): corresponds to the distance between both the nasal wings in a patient's basal view.
5. Nasal base to pronasion distance { ($BL_L - BL_R$) $\rightarrow$ PRN}: it corresponds to the distance from the midpoint of nasal base to pronasion.
6. Nasal wing to pronasion distance ($AL - PRN$): it corresponds to the distance from the nasal wing in the most convex area to the pronasion.
7. Nasal length ($N - PRN$): it corresponds to the length of the dorsum of nose from nasion to pronasion.
8. Nasal height ($EN - N$): it corresponds to the distance from the endocanthion to the nasion.
9. Nasal base index :

$$\frac{\text{BialarBased distance} \cdot (BL_L - BL_R)}{\text{Nasal base to pronasion} \cdot (BL_L - BL_R \rightarrow PRN)} \times 100$$

10. Nasal index :

$$\frac{\text{Bialar distance} \cdot (AL_L - AL_R)}{\text{Nasal length} \cdot (N_A \rightarrow PRN)} \times 100$$

RESULTS

In all the ten parameters seven parameters were found to be significantly higher in the males than their counterpart female members ($p < 0.001$). The results with the minimum, maximum and the means of the parameters are summarized in Table 1.

1. **Distance between endocanthion points :**
The results obtained with respect to the distance between left and right endocanthion showed that the Mewari male population exhibited a mean intercanthal distance of 27.00 mm (minimum 18.00 mm and maximum 38.50 mm), while the female population of the same region had mean of 27.52 mm (minimum 18.00 mm and maximum 43.60 mm), with $p < 0.001$, establishing no

significant difference between both the genders.

2. **Nasal bone base width:** According to the nasal bony base width, it was determined that female population has a mean value of 29.11 mm (with minimum and maximum values of 15.00 mm and 43.00 mm respectively), while the mean of the male population was 30.99 mm (minimum 22.18 mm and maximum 45.30 mm), with $p < 0.001$, showed a significant difference between the genders.
3. **Interalar distance:** The male population presented the mean interalar distance of 37.10 mm, with the minimum and maximum values for the male population as 23.80 mm and 45.80mm respectively, while the same values for the female population were 20.60 mm and 49.40 mm, with the mean interalar distance of 35.00 mm. On analysis with $p < 0.001$, a significantly higher value for the male population was found over the females.
4. **Bialar base distance:** The female population presented a mean bialar distance of 22.88 mm, while the same value for the male population was 25.21 mm, with the minimum and maximum values for the males and females were 43.88 mm, 14.10 mm and 36.40 mm and 10.80 mm respectively.
5. **Nasal base to pronasal distance:** The mean distance from the pronasal to the nasal base in the male and female was 20.75 mm and 19.59 mm respectively. The minimum values for the male and female population were 10.40 mm and 10.12 mm, whereas the maximum distance for the same were 32.80 mm and 30.02 mm respectively, with $p < 0.001$ a significant difference was found in between the genders with males having the higher values.
6. **Nasal wing to pronasal distance:** The female group showed the mean distance with their minimum and maximum values

as 26.11mm, 12.20 mm and 34.20 mm respectively, while the same values for the male population were 27.54 mm , 19.50 mm and 37.00 mm respectively, with $p < 0.001$ a significant difference between the genders was observed.

7. **Nasal length:** The female population had a mean nasal length of 45.83 mm (minimum 27.10 mm and maximum 63.80 mm), while the mean nasal length of the male population with their minimum and maximum values were 48.10mm, 28.40 mm and 69.40 mm respectively, with $p < 0.001$, showed a significantly higher values for the male population.
8. **Nasal projection:** The male and female populations had a mean of 26.05 mm (minimum 15.52 mm and maximum 32.00 mm) and 24.30 mm (minimum 12.60 mm and maximum 35.60 mm) respectively. There was a significant difference observed at $p < 0.001$.
9. **Nasal index:** The female population showed the mean index value of 77.52, while that of the male population had a mean value of 79.40. The values of the indices for both the genders fall under the mesorhine type of nose.
10. **Nasal base index:** This new index calculated by measuring the bialar base distance and the nasal base distance. The mean values for the female and male population for the said index were 104.83 and 120.13 and on analyzing with $p < 0.001$, were not found to be significantly dimorphic.

DISCUSSION

As seen in the western countries, in the contemporary Indian society, aesthetic is becoming a matter of concern at all ages and probably in all social strata. Among all parts of the body, primary attention is given to the face^{9,10}.

With the increased interest in cosmetic rhinoplasty in recent decades, much research

has been performed to examine and refine the canons by which beauty may be measured. Much of this work has been dealt in the North American white population. As the human nose differs in anatomy and morphology between racial groups, it has become readily apparent to the practitioners that most of these patients place great importance on maintaining their core ethnic features while achieving cosmetic enhancement. Thus, knowledge of the unique shape, anatomy, and dimensions of the nose would be very useful for surgeons undertaking repair and reconstruction of the nose¹¹.

CONCLUSION

The clinicians and surgeons should be provided with aesthetic guidelines in reference to their subjects of the same age, sex and ethnic groups. These guidelines thus made through the present study, may offer useful indicators for the best kind of treatments offered to patients in our region, as patients who undergo nasal surgeries often do not prefer perfect noses like that of Caucasians canons , but opt for a shape harmonious and with the characteristics of the population where they belong^{6,7}.

ACKNOWLEDGEMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in the references of this manuscript. The authors are also grateful to the authors/ editors/ publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

REFERENCES

1. Costa JR, Prates JC, De Castilho HT, Santos RA: Estudio craneométrico de los huesos nasales y proceso frontal de maxilla. *Int. Journal of Morphology* 2005, 23 (1), 9-12.
2. Perez JP, Olson KL: Analysis of African American female nose. *Plast. Surg.* 2003, 111(2), 620-626.
3. Canut J: Un análisis estético dentofacial. *Rev. Esp. Ortod.* 1996, 26,13-30.
4. Rodríguez CJ. La antropología forense en la identificación humana. Bogotá, universidad nacional de Colombia 2004, 185-214.
5. Stephan CN, Henneberg M and Sampson W: predicting nose projection and pronasale position in facial approximation: a test of published methods and proposal of new guidelines. *Am J Phys. Anthropology.* 2003, 122 (3): 240-50.
6. Bull TR< Rhinoplasty: aesthetics, ethics and airways. *J laryng otol.* 1983, 97 (10): 901-96.
7. Daniel RK, Farkes LG: Rhinoplasty: image and reality. *Clinical plastic surgery.* 1988 .15 (1): 1-10.
8. Leong SC, White PS: A comparison of aesthetic proportions between Oriental and Caucasian nose. *Otol. All .Sc.* 2004 29 (6): 672-6.
9. Bashour M history and current concepts in the analysis of facial attractiveness. *Plastic Reconstructive surgery.* 2006. Sep11, 8 (3): 741-56.
10. Johnson N, Sandy J. an aesthetic index for evaluation of cleft repair. *Eur J orth.* 2003, 25(3): 243-9.
11. Heidari z, Khammar T.< Khammar M: anthropometric measurements of the external nose in 18-25 year old sistani and baluch aborigine in southeast of Iran. *Folia Morph,* 2009, vol 68 (2), 88-92.

Table 1: Minimum, Maximum and Means of the linear parameters of various parameters of the adults of the Mewar region

Parameters	Min (mm)	Max (mm)	Mean $\pm$ Std Dev (mm)
Males			
En-En	18.00	38.50	27.00 $\pm$ 4.97
B-B	22.18	45.30	30.99 $\pm$ 4.50*
Al-Al	23.80	45.80	37.10 $\pm$ 4.55*
Bl-BLl	14.10	43.88	25.21 $\pm$ 4.78*
Bl-Prn	10.40	32.80	20.75 $\pm$ 4.26*
Al-Prn	19.50	37.00	27.54 $\pm$ 4.08*
N-Prn	28.40	69.40	48.10 $\pm$ 6.95*
En-N	12.60	32.00	24.30 $\pm$ 5.20*
Nasal Index	46.08	137.323	79.40 $\pm$ 17.56
Nasal Base Index	54	255.35	126.67 $\pm$ 34.56
Females			
En-En	18.00	43.60	27.52 $\pm$ 4.67
B-B	15.00	43.00	29.11 $\pm$ 5.15*
Al-Al	20.60	49.40	35.02 $\pm$ 5.61*
Bl-Bl	10.80	36.40	22.88 $\pm$ 5.00*
Bl-Prn	10.12	30.02	19.59 $\pm$ 3.67*
Al-Prn	12.20	34.20	26.11 $\pm$ 4.43*
N-Prn	27.10	63.80	45.83 $\pm$ 6.86*
En-N	15.52	35.60	26.05 $\pm$ 7.00*
Nasal Index	37.59	117.58	77.52 $\pm$ 13.75
Nasal Base Index	54.30	342.88	120.46 $\pm$ 38.872
P < 0.001*			