Clinical Analysis of Nasal Parameters of 61 Medical Students in South Indians

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Original research Article

ABSTRACT

Background: The shape of the nose indicates the ethnicity ,race, age, and sex. Anthropometric parameters vary with age, sex, and ethnic background, and several authors have attempted to document the normative values which may serve as references.

Materials and methods: This study includes measurement of different parameters of nose among 61 South Indian medical students (34 females;27 males) which were statistically analysed.

Results: 1) Morphological width of the nose -3.3cm (males) and 2.9 cm(females).2) Columella Length -1.8 cm(males) and 1.6 cm(females).3) Columella Width -0.59 cm(males) and 0.57 cm(females).4) Alar Width -0.52 cm (males) and 0.45 cm (females). 5).The most common type of cheek alar groove was cheek type followed by labial and tube type in both males and females.

Conclusion: All the measurements can be used for evaluation of nasal deformity, treatment planning and post surgical evaluation of the correction achieved during rhinoplasty.

Keywords: Alar width; columella length; columella width; cheek alar groove.

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1. INTRODUCTION

The meaning of the word "aesthetics" is to sense and it expresses tastes and values of every culture. For beautification of the nose,the evaluation should be based on anthropometric considerations which are related to individual's relationship with society and its racial and ethnic considerations. There are many studies that analysed anthropometric nasal parameters among different regions of Indian population [1,2,3,4]. This study is carried out among males and females of South India which will help in understanding the idea of a perfect nose among South Indian population. Analysing these variations will also help in the treatment planning as well as post operative evaluation of the nose in question. The face is divided into three equal portions by four horizontal lines [5].

- ▸ **Glabella-** Bony triangular area on frontal bone between the supraorbital ridges [5].
- ▸ **Nasion-** Junction of upper end of suture between nasal bones with frontal bones [5].
- ▸ **Rhinion-** The lower end of suture between the nasal bones [5].
- ▸ **Subnasal-** Point at the nasal spine where the nasal septum merges with upper lip in the mid saggital plane [5].
- ▸ **Frankfort line-** A line along intraorbital border and tragus [5].
- ▸ **Gnathion-** Lowest point in the midline of chin [5].

2. MATERIALS AND METHODS

After obtaining Institutional ethics committee clearance and consent from 61 South Indian Medical students(34 females and 27 males) aged between 21 and 25 years,procedure was explained to them. Pictures of basal view,frontal view,profile view of nose of the students were taken methodically. Measurements using Vernier calipers were taken and statistically analysed using Pearson's Chi Square Test. Students who have undergone previous nasal surgeries and having nasal deformities or trauma were not included in the study.

The measurements were documented by photography.The photographic set up consisted of Canon SX610 HS Digital camera with camera effective pixels of approx 20.2 megapixels.Aspect ratio 4:3..All images are taken under uniform illumination.The subjects were asked to sit against a dark coloured backdrop and were asked to look straight into the camera in natural head position with facial muscles relaxed.All the photographs were taken at a distance of 5 feet for a sharp image.

The parameters measured were-

1. **Morphological width of the nose -** The maximum length between the most lateral point in the curved base line of each ala [6].
2. **Columella length-** The distance between subnasal and highest point of columella [6].
3. **Columella width-** The distance between midpoints of columella [6].
4. **Alar width-** The distance between the midportion of the alae where the thickness of each ala is measured [6].
5. **Cheek alar groove-** The shape and resiliency of the nostril and the posterior half of the alar side walls depend on dense fibro-fatty connective tissue.The variations of the cheek alar groove are-a) Cheek type, b) Labial type, c) Tube type [7].

3. RESULTS

The mean values of different nasal parameters are enlisted below:

1. **Morphological width of the nose-** a) Among males, the mean morphological width of nose was 3.3cm and it varied from 2.94cm to 3.66 cm (Table 1). Out of 27 males,20(74.07%) are within the range,4(14.81%) more than the range and 3(11.11%) less than the range. b)The mean morphological width of nose among females was 2.9 cm and it varied from 2.67cm to 3.13 cm (Table 2). Out of 34,24(70.59%) lie within the range,6(17.65%) more than the range and 4(11.75%) less than the range.
2. **Columella length-** a) Among males, the mean columella length was 1.8cm and it varied from 1.35 cm to 2.25 cm (Table 1). Out of 27,20(74.07%) lie the range,3(11.11%) more than the range and 4(14.81%) less than the range. b)The mean columella length among females was 1.6 cm and it varied from 1.37 cm to 1.83 cm (Table 2).Out of 34,26(76.47%) lie within the range,5(14.70%) more than the range and 3(8.82%) less than the range.
3. **Columella width-** a) Among males, the mean columella width was 0.59cm and it

varied from 0.47 cm to 0.71 cm (Table 1). Out of 27, 21(77.77%) lie the range,2(7.41%) more than the range and 4(14.81%) less than the range. b)The mean columella width among females was 0.57 cm and it varied from 0.48 cm to 0.66 cm (Table 2).Out of 34,25(73.53%) lie within the range,6(17.65%) more than the range and 3(8.82%) less than the range.

4. **Alar width-** a) Among males, the mean alar width was 0.52cm and it varied from 0.42 cm to 0.62 cm (Table 1). Out of 27,18(66.66%) lie the range,2(7.41%) more than the range and 7(25.92%) less than the range. b)The mean alar width among females was 0.45 cm and it varied from 0.38 cm to 0.52 cm (Table 2). Out of 34, 29 (85.29%) lie within the range, 2 (5.88%) more than the range and 3(8.82%) less than the range.

5. **Cheek alar groove-** The most common type of cheek alar groove was found to be cheek type followed by labial and tube type in both males and females. In males, out of 27, 15(55.55%) had cheek type, 9(33.33%) had labial type and 3(11.11%) tube type. In females, out of 34, 20(58.82%) had cheek type, 13(38.23%) had labial type and 1(2.94%) had tube type (Table 3).

Studying variations of nose gives us an idea about the variations of anthropometric aspects of nose between males and females.

4. DISCUSSION

The nose balances the facial appearance .The shape of the nose differs with ethnicity,race, age, and sex. This study is aimed to describe the differences in various nasal anthropometric measurements among South Indian males and females.

The mean morphological width of nose for males was found to be 3.3±0.36cm (Table 1) which is more than females (2.9±0.23cm) by 13% approximately (Table 2). This was similar to the study conducted by Ahmet Uzhun et al. [6] (3.3 cm) in Turkish males but shorter than Afro–American [8] (4.3cm), Chinese [9] (3.9cm), Japanese [10] (3.6cm),Canadian–Caucasian [11] (3.6cm),African [12] (4.5cm), Afro–Caucasian noses[12] (3.9cm) and Afro-Indians [12] (4.2 cm) by 38%,25%,16%,16%,45%,25% and 35% respectively.

Table 1. Mean with standard deviation of different nasal parameters in males

Nasal parameters	Mean	Standard deviation	Minimum	Maximum
Morphological width of nose(cm)	3.3	0.36	2.94	3.66
Columella Length(cm)	1.8	0.45	1.35	2.25
Columella Width(cm)	0.59	0.12	0.47	0.71
Alar Width(cm)	0.52	0.10	0.42	0.62

Table 2. Mean with standard deviation of different nasal parameters in females

Nasal Parameters	Mean	Standard deviation	Minimum	Maximum
Morphological width of nose(cm)	2.9	0.23	2.67	3.13
Columella Length(cm)	1.6	0.23	1.37	1.83
Columella Width(cm)	0.57	0.09	0.48	0.66
Alar Width(cm)	0.45	0.07	0.38	0.52

Table 3. Frequency of cheek alar groove in males and females

Gender	Cheek	Labial	Tube	Total	
Males	15(55.55%)	9(33.33%)	3(11.11%)	27	
Females	20(58.82%)	13(38.23%)	1(2.94%)		34
Total	35	22	4		61

The mean columella length for males was found to be 1.8±0.45 cm (Table 1) which is more than females (1.6±0.23cm) (Table 2) by 12.5% approximately. This was more than the Turkish men [6] (0.9 cm), Chinese [9] (1.1cm), Caucasian [8] (1.1 cm) and Afro–American [8] (1 cm), Afro–Indians [12] (0.8cm) but shorter than Japanese [10] (2.2cm) by 47%,35%,35%,41%,52% and 29% respectively.

The mean columella width for males was found to be 0.59±0.12 cm (Table 1) which is more than females (0.57±0.09cm) (Table 2) by 3% approximately. This is greater than what was found by Ahmet Uzhun et al. [6] (0.5 cm) by 8%.

The mean alar width for males was found to be 0.52±0.10 cm (Table 1) which is more than females (0.45±0.07 cm) (Table 2) by 13%. This is similar to what was found by Ahmet Uzhun et al. [6] (0.48cm).

The most common type of cheek alar groove was cheek type followed by labial and tube type in both males and females (Table 3).

5. SUMMARY

The shape of the nose is a signature indicating the ethnicity ,race, age, and sex. Anthropometric parameters vary with age, sex, and ethnic background, and several authors have attempted to document normative values which may serve as references.

This study includes measurement of different parameters of nose among 61 South Indian medical students (34 females; 27 males) using vernier calliper and was statistically analysed.

The means of various parameters were- 1) Morphological width of the nose -3.3cm (males) and 2.9 cm (females).2) Columella length -1.8 cm(males) and 1.6 cm(females).3) Columella Width -0.59 cm(males) and 0.57 cm(females).4) Alar Width -0.52 cm(males) and 0.45 cm (females). 5).The most common type of cheek alar groove was cheek type followed by labial and tube type in both males and females.

All the measurements can be used for evaluation of nasal deformity, treatment planning and post surgical evaluation of the correction achieved during rhinoplasty.

6. LIMITATIONS OF THE STUDY

1. Low study population.

2. Medical students often do not represent all young people.

7. CONCLUSION

The variations between males and females in same geographical locations are due to the genetic makeup.The normal values will help in evaluating nasal deformities and will
help us mapping the results of rhinoplasty in South Indians .

CONSENT

From all the participants informed consent was obtained before the start of the study.

ETHICAL STANDARDS

"The authors assert that all procedures contributing to this work comply with the ethical standards of our institutional guidelines on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008."

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ray SK, Saha K, Kumar A, et al. Anthropometric study of nasal index among the population of Western Uttar Pradesh Region. Intern Sci Study. 2016;4.
2. Risley HH. People of India, Calcutta, Thacker, Spink & Co; 1915. [Reprinted, 1969, at Delhi: Oriental Book Reprint Corporation.
3. Basu A, Mukherjee N, Roy S, et al. Ethnic India: a genomic view, with special reference to peopling and structure. Genome Res. 2003;13:2277-2290.
4. Majumder PP. People of India: biological diversity and affinities. Evolut Anthro.1998;6:100-110.
5. Sood VP.Corrective rhinoplasty. 3rd edition. Sood VP. Corrective rhinoplasty. 3rd edition. New Delhi:CBS Publishers and Distributors Pvt. Ltd. 2013:17-18,28-29.
6. Ahmet Uzun, Fikri Ozdemir. Morphpmetric analysis of nasal shapes and angles in young adults.Braz J Otorhinolaryngol. 2014;80:397-402.
7. Oneal RM, Beil RJ, Schlesinger J. Otolaryngologic Clinics of North America.

February.1999;32(1):165.

8. Ofodile FA, Bokhari F. The African–American nose: Part II. Ann Plast Surg. 1995;34:123–9.

9. Aung SC, Foo CL, Lee ST. Three dimensional laser scan assessment of the oriental nose with a new classification of oriental nasal types. Br J Plast Surg. 2000;53:109–16.

10. Ochi K, Ohashi T. The effects of an external nasal dilator and nasal dimensions in Asians. Otolarygol Head Neck Surg. 2002;126:160-3.

11. Farkas LG, Phillips JH, Katic M. Anthropometric anatomical and morphological nose widths in Canadian–Caucasion adults. Can J Plast Surg. 1998;6(3):149–51.

12. Ofodile FA, Bokhari F, Ellis C. The black American nose. Ann Plast Surg. 1993;31:209–18.

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