



“COMPARATIVE STUDY OF VARIOUS NASAL PARAMETERS AMONG NORTHERN AND SOUTHERN POPULATION OF INDIA”.

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ABSTRACT

Background: 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.

Materials and Methods: This study includes measurement of different parameters of nose among 14 North Indian (9 males; 5 females) and 61 South Indian medical students (27 males; 34 females) using vernier calliper and was statistically analysed.

Results: The means of various parameters were- 1) Nasal Breadth -2.8cm (North Indians) and 2.7 cm (South Indians). 2) Nasal height- 5.2cm (North Indians) and 4.9cm (South Indians). 3) The nasofacial angle-39.4 degree (North Indians) and 37.2 degree (South Indians). 4) The nasolabial angle is 118.2 degree (North Indians) and 115.9 degree (South Indians). 5) The nasofrontal angle 129.3 degree (North Indians) and 131.3 degree (South Indians). 6) The most common type of nose is leptorrhine in both North and South Indians.

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 : Leptorrhine, nasal height, nasofrontal angle, mesorrhine

INTRODUCTION

A good facial aesthetics influences the judgement of culture-specific beauty as it expresses the tastes and values of that society. It also plays an important role in the assessment of personality and social acceptance. The surgeon must be sensitive to the values expressed by the patients and should integrate their desires to emulate these cultural values. Thus, a common aesthetic sense prevails that serves as a base for aesthetic judgements of taste. Indian population is a blend of Negrito Mongoloid, Caucasoid, and Australoid races that reflects diversified culture, language, ethnic and genetic background but there is a clear demarcation in genetic and physical components between North and South Indian populations.¹ For rhinoplasty, studying these variations of nose will give idea about the anthropometric aspects of nose northern and southern population. The face is divided into three equal portions by four horizontal lines.² From above downwards, trichion at the hairline in the middle of the forehead, the nasion at the frontonasal suture at the level of eyebrows, the subnasal at the depth of nasolabial angle and gnathion at the lowermost point on the front of nose.²

- Glabella-Bony triangular area on frontal bone between the supraorbital ridges.²
- Nasion-Junction of upper end of suture between nasal bones with frontal bones.²
- Rhinion-The lower end of suture between the nasal bones.²
- Subnasal-Point at the nasal spine where the nasal septum merges with upper lip in the mid saggital plane.²
- Frankfort line-A line along intraorbital border and tragus.²
- Gnathion-Lowest point in the midline of chin.²

MATERIALS AND METHODS

Clearance from the Institutional ethics committee and consent were obtained from 61 South Indian (males-27; females-34) and 14 North Indian (males-9; females-5) medical students 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 by single observer to prevent inter-observer error. Measurements using Vernier calipers were taken and statistically analysed. Students who have undergone previous rhinoplasty or nasal surgeries or having any diseases of the nose which are causing destruction or deformities of the nose or having obvious history of trauma or injury to nose were not included in the study.

The photographic set up consisted of Canon SX610 HS Digital camera with camera effective pixels of approx 20.2 megapixels. Aspect ratio 4:3. Focal length of lens: 18x zoom: 4.5(w)-81.0(T) mm, 35 mm film equivalent 25(W)-450(T)mm. 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. Photographs were taken according to each view. The photographs were analysed using Digimiser Software. All the photographs were taken at a distance of 5 feet for a sharp image. Analysis was done using student's t test.

The parameters measured were-

1. Nasal Breadth- The maximum distance between two ala.³
2. Nasal height- Height of the nose (NH) from nasion (midpoint of nasofrontal suture) to subnasale (junction between lower border of the nasal septum and the cutaneous portion of the upper lip).³
3. Nasofacial angle- The angle between a line touching the nasion and chin and the dorsal plane of the nose. It is between 30 degree and 40 degree.²
4. Nasolabial angle- The angle between columella and plane of the upper lip with its apex at subnasal. It is between 90 -95 degree for males and 100-110 degree for females.²
5. Nasofrontal angle- The angle between dorsum of nose and glabella part of the forehead. It is about 125 degree.²

Nasal Index which is Nasal Breadth/ Nasal Height x 100 was calculated and types of nose was classified into Leptorrhine, Mesorrhine and platyrrhine. Leptorrhine has Nasal index of 69.90 or less, Mesorrhine has Nasal index between 70 & 84.90 and Platyrrhine has nasal index of 85 & above.³

RESULTS**The mean values of different nasal parameters are enlisted below:**

1. Nasal breadth- a) Among North Indians, the mean nasal breadth was 2.8cm and it varied from 2.41 cm to 3.19 cm. Out of 14, 8(57.14%) lie the range, 4(28.57%) more than the range and 2(14.28%) less than the range.

b) The mean nasal breadth among South Indians was 2.7 cm and it varied from 2.33 cm to 3.07 cm. Out of 61, 47(77.05%) lie within the range, 10(16.39%) more than the range and 4(6.55%) less than the range.

2. Nasal Height- a) Among North Indians, the mean nasal height was 5.2cm and it varied from 4.31 cm to 6.09 cm. Out of 14, 13(92.86%) lie the range, 1(7.14%) more than the range and nobody less than the range.

b) The mean nasal height among South Indians was 4.9 cm and it varied from 4.57 cm to 5.23cm. Out of 61, 40(65.57%) lie within the range, 13(21.31%) more than the range and 8(13.11%) less than the range.

3. Nasofacial angle- a) Among North Indians, the mean nasofacial angle was 39.4 degree and it varied from 35.22 to 43.58 degree. Out of 14 ,10(71.43%) lie the range,1(7.14%) more than the range and 4(28.57%) less than the range .

b) The mean nasofacial angle among South Indians was 37.2 degree and it varied from 33.09 to 41.31 degree. Out of 61 ,44(72.13%) lie within the range,10(16.39%) more than the range and 7(11.47%) less than the range .

4. Nasolabial angle- a) Among North Indians, the mean nasolabial angle was 118.2 degree and it varied from 110.48 to 125.92 degree. Out of 14 ,10(71.43%) lie the range,2(14.28%) more than the range and 2(14.28%) less than the range .

b) The mean nasolabial angle among South Indians was 115.9 degree and it varied from 108.2 to 123.6 degree. Out of 61 ,44(72.13%) lie within the range,7(11.47%) more than the range and 10(16.39%) less than the range .

5. Nasofrontal angle- a) Among North Indians, the mean nasofrontal angle was 129.3 degree and it varied from 121.38 to 137.22 degree. Out of 14 ,8(57.14%) lie the range,4(28.57%) more than the range and 2(14.28%) less than the range .

b) The mean nasofrontal angle among South Indians was 131.3.7 degree and it varied from 121.81 to 140.79 degree. Out of 61 ,44(72.13%) lie within the range,10(16.39%) more than the range and 7(11.47%) less than the range .

6. Type of nose- The most common type of nose was found to be leptorrhine followed by mesorrhine and platyrrhine in both North and South Indians. In North Indians, out of 14, 13(92.86%) have leptorrhine type,1(7.14%) have mesorrhine type and no one had platyrrhine type. In South Indians, out of 61,50(81.97%) have leptorrhine type,10(16.39%) have mesorrhine type and 1(1.64%) platyrrhine type .

DISCUSSION

The nasal pyramid plays a noticeable cosmetic role in the appearance of the whole face; it provides harmony and balance to the face. 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.⁴ This study is aimed to describe the differences in various nasal anthropometric measurements among North Indian and South Indian population.

The mean nasal breadth for North Indians was found to be 2.8±0.39 cm which is more than South Indians (2.7±0.37cm). The mean nasal height for North Indians was 5.2±0.89cm which is again higher than South Indians(4.9±0.33 cm). The mean nasal breadth and nasal height were lower than that found by Patil *et al*⁵, Jagadish Chandra *et al*⁶ and Khanderkar *et al*.⁷ but higher than what reported by Sudhakar *et al*.⁸

The mean Nasofacial angle in North Indians was 39.4±4.18 degree that was greater than South Indians (37.2 ±4.11 degree). According to Naini *et al*⁹, the ideal nasofacial angle was 30 degree with range from 27 to 36 degree; above which it was considered unattractive.

The mean Nasolabial angle in North Indians was 118.2 ±7.72 degree that was greater than South Indians(115.9±7.70 degree). This result is greater than what was advised by Vinay Dua *et al*¹⁰; in Indian population ,Ahmet Uzhun *et al*¹¹ in Turkish population and by Jay P Fitzgerald *et al*¹²; in white population in US.

The mean Nasofrontal angle in North Indians was 129.3±7.92 degree that was lesser than South Indians(131.3±9.49 degree). This result is lesser than that found by Munish Reddy *et al*¹³ and Ahmet Uzun *et al*¹² in Turkish population.

In the present study, North Indians have leptorrhine followed by mesorrhine and no platyrrhine type of nose. South Indians have leptorrhine followed by mesorrhine and one platyrrhine This was similar to study by Radha *et al*³ and opposite to the findings of Patil *et al*⁵ who stated that the common type of nose in South Indian population was Mesorrhine in males and leptorrhine in females and also that of Kannan *et al*¹⁴ and Gangrade *et al*¹⁵ who found the predominant type was mesorrhine pattern in North Indian population.

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 14 North Indian(9 males;5 females) and 61 South Indian medical students (27 males;34 females) using vernier calliper and was statistically analysed.

The means of various parameters were- 1)Nasal Breadth -2.8cm (North Indians) and 2.7 cm(South Indians).2)Nasal height-5.2cm(North Indians) and 4.9cm(South Indians).3)The nasofacial angle-39.4 degree(North Indians) and 37.2 degree(South Indians). 4)The nasolabial angle is 118.2 degree(North Indians) and 115.9 degree(South Indians).5)The nasofrontal angle 129.3 degree(North Indians) and 131.3 degree(South Indians).6).The most common type of nose is leptorrhine in both North and South Indians.

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

Table 1: Mean with standard deviation of different nasal parameters in North Indians

Nasal Parameters	Mean	Standard deviation	Minimum	Maximum
Nasal breadth (cm)	2.8	0.39	2.41	3.19
Nasal height(cm)	5.2	0.89	4.31	6.09
Nasofacial angle(degree)	39.4	4.18	35.22	43.58
Nasolabial angle(degree)	118.2	7.72	110.48	125.92
Nasofrontal angle(degree)	129.3	7.92	121.38	137.22

Table 2: Mean with standard deviation of different nasal parameters in South Indians

Nasal Parameters	Mean	Standard deviation	Minimum	Maximum
Nasal breadth (cm)	2.7	0.37	2.33	3.07
Nasal height(cm)	4.9	0.33	4.57	5.23
Nasofacial angle(degree)	37.2	4.11	33.09	41.31
Nasolabial angle(degree)	115.9	7.70	108.2	123.6
Nasofrontal angle(degree)	131.3	9.49	121.81	140.79

Table 3: Frequency of types of nose in North and South Indians

Gender	Leptorrhine	Mesorrhine	Platyrrhine
North Indians	13(92.86%)	1(7.14%)	0
South Indians	50(81.97%)	10(16.39%)	1(1.64%)



Figure 1. Nasofacial angle

CONCLUSION

The difference in the anthropometric measurements between North and South Indians is due to geographical and regional variations because of difference in ethnicity and genetic composition. Thus, this study can be used as a reference for evaluation of nasal deformity, treatment planning and post surgical evaluation of the correction achieved during rhinoplasty.

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