

An Anthropomorphic Study of Nasal Parameters of Jain Population in North Rajasthan

Dr. Hemant Kumar¹, Dr. Rakesh Mani², Dr. Koushal Ranga³

¹Post Graduate Student, Department of Anatomy, S.P. Medical College and Associated Group of P. B. M. Hospitals, Bikaner, Rajasthan, India

²Senior Professor and HOD, Department of Anatomy, S.P. Medical College and Associated Group of P. B. M. Hospitals, Bikaner, Rajasthan, India

³Post Graduate Student, Department of Anatomy, S.P. Medical College and Associated Group of P. B. M. Hospitals, Bikaner, Rajasthan, India

Abstract: Background: Nasal anthropometry is an important method for studying facial morphology, ethnic variation and sexual dimorphism. Nasal index is widely used to classify nasal shape into leptorrhine, mesorrhine and platyrrhine types. Limited data are available regarding nasal parameters of the Jain population of North Rajasthan. Aim: To study nasal height, nasal breadth, nasal index and nasal type distribution among Jain males and females of North Rajasthan. Materials and Methods: This cross-sectional observational study was conducted in the Department of Anatomy, S.P. Medical College, Bikaner. A total of 100 healthy Jain subjects aged 18–60 years were included, with 50 males and 50 females. Nasal height and nasal breadth were measured using standard anthropometric instruments. Nasal index was calculated as nasal breadth divided by nasal height multiplied by 100. Data were expressed as mean, standard deviation, number and percentage. Results: The majority of subjects belonged to the 21–30 years age group (33%). Males had significantly greater nasal height 5.15 ± 0.42 cm than females 4.82 ± 0.36 cm ($p=0.04$). Nasal breadth was also higher in males 3.90 ± 0.38 cm than females 3.52 ± 0.35 cm ($p=0.02$). Mean nasal index was 75.7 ± 6.8 in males and 73.0 ± 7.2 in females, with no significant difference ($p=0.12$). Mesorrhine was the commonest nasal type, seen in 65% of the total population. Conclusion: The Jain population of North Rajasthan predominantly shows mesorrhine nasal morphology. Males have larger nasal height and breadth than females, indicating sexual dimorphism. These data may be useful in forensic identification, anthropological studies and reconstructive facial surgery.

Keywords: Nasal anthropometry, nasal index, nasal height, nasal breadth, Jain population, North Rajasthan, mesorrhine, leptorrhine, platyrrhine, sexual dimorphism, forensic anthropology, reconstructive surgery.

1. Introduction

Anthropometry is the scientific study of measurements of the human body and its parts. It is an important tool in anatomy, physical anthropology, forensic science, plastic surgery and reconstructive surgery. Among facial structures, the nose is one of the most important anatomical landmarks because it has functional, aesthetic and ethnic importance. Nasal morphology varies among different populations due to genetic, racial, ethnic, environmental and climatic factors.

The nasal index is one of the most commonly used anthropometric indices for studying nasal shape. It is calculated by dividing nasal breadth by nasal height and multiplying by 100. According to nasal index, nose types are classified as leptorrhine, mesorrhine and platyrrhine. Leptorrhine indicates a long and narrow nose, mesorrhine indicates a medium nose and platyrrhine indicates a broad nose.

India has wide regional, ethnic and community-based diversity. The Jain community of North Rajasthan represents a distinct cultural and social group. Due to endogamous marital practices and relatively stable community structure, this population may show characteristic nasal features. However, limited data are available regarding nasal anthropometry in the Jain population of North Rajasthan. Therefore, this study was conducted to provide baseline data on nasal height, nasal breadth, nasal index and nasal type distribution among Jain males and females of North Rajasthan.

2. Aim and Objectives

Aim:

To study nasal parameters and nasal index in the Jain population of North Rajasthan.

Objectives:

- 1) To measure nasal height and nasal breadth in Jain males and females.
- 2) To calculate nasal index in the Jain community of North Rajasthan.
- 3) To classify nasal type according to nasal index.
- 4) To compare nasal parameters between males and females.
- 5) To provide baseline anthropometric data useful for forensic, anthropological and reconstructive purposes.

3. Materials and Methods

This was a cross-sectional observational study conducted in the Department of Anatomy, S.P. Medical College and Associated Group of Hospitals, Bikaner, Rajasthan. The study included 100 healthy subjects of the Jain community of North Rajasthan, consisting of 50 males and 50 females, aged between 18 and 60 years.

Subjects were selected according to predefined inclusion and exclusion criteria. Individuals who gave written informed consent, belonged to the Jain community and were willing to participate were included. Subjects with history of nasal

trauma, plastic or reconstructive surgery, congenital nasofacial abnormality, Down syndrome or acquired deformity were excluded.

Nasal measurements were taken using standard anthropometric instruments such as spreading caliper, digital Vernier caliper and sliding compass. Subjects were seated in a relaxed position with head in anatomical position. Nasal height was measured from nasion to pronasale. Nasal breadth was measured as the maximum distance between the right and left alae. Nasal index was calculated using the formula:

$$\text{Nasal Index} = \text{Nasal Breadth} / \text{Nasal Height} \times 100$$

The nasal index was classified into leptorrhine, mesorrhine and platyrrhine types. Data were entered and analyzed statistically. Continuous variables were expressed as mean $\pm$ standard deviation, and categorical variables were expressed as number and percentage. Unpaired t-test was used for comparison of continuous variables, and chi-square test was used for categorical variables. A p value less than 0.05 was considered statistically significant.

4. Results

A total of 100 subjects were included in the study, with equal male and female distribution. The maximum number of subjects belonged to the 21–30 years age group, 33%, followed by 31–40 years, 24%. The least number belonged to the 50–60 years age group, 13%.

Private job was the most common occupation among both males and females. Rural participants were slightly more common than urban participants, with 52% males and 56% females belonging to rural areas. Most subjects belonged to the middle socioeconomic class.

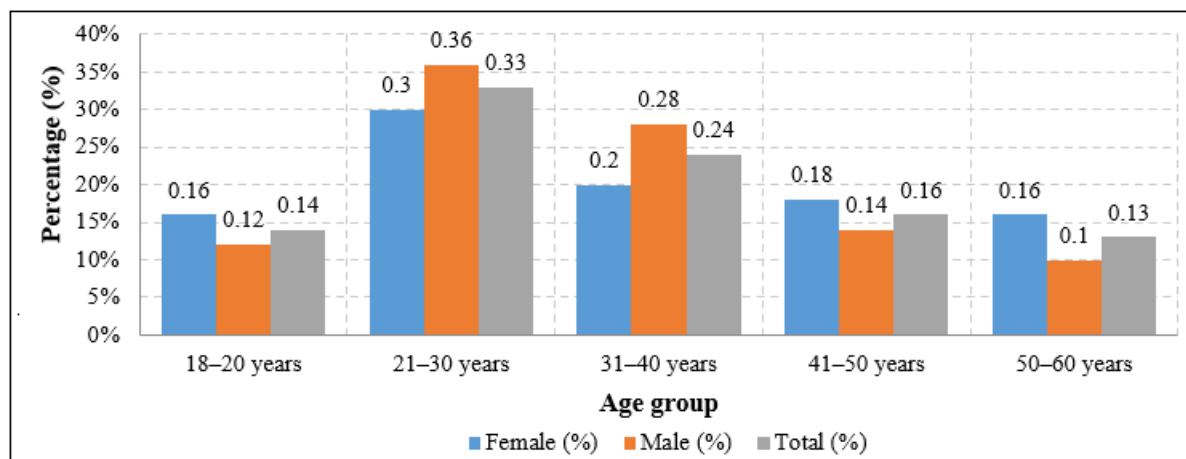
Males had higher nasal dimensions than females. Mean nasal height was 5.15 ± 0.42 cm in males and 4.82 ± 0.36 cm in females, and this difference was statistically significant ($p=0.04$). Mean nasal breadth was 3.90 ± 0.38 cm in males and 3.52 ± 0.35 cm in females, also statistically significant ($p=0.02$). However, mean nasal index was 75.7 ± 6.8 in males and 73.0 ± 7.2 in females, with no significant difference ($p=0.12$).

In males, mesorrhine nose was most common, seen in 32 subjects (64%), followed by leptorrhine in 10 subjects (20%) and platyrrhine in 8 subjects (16%). In females also, mesorrhine was most common, seen in 33 subjects (66%), followed by leptorrhine in 12 subjects (24%) and platyrrhine in 5 subjects (10%).

Overall, the most common nasal type in the Jain population was mesorrhine, 65%, followed by leptorrhine, 22%, and platyrrhine, 13%.

Table 1: Age Distribution of Study Subjects

Age group	Female No. (%)	Male No. (%)	Total No. (%)
18–20 years	8 (16%)	6 (12%)	14 (14%)
21–30 years	15 (30%)	18 (36%)	33 (33%)
31–40 years	10 (20%)	14 (28%)	24 (24%)
41–50 years	9 (18%)	7 (14%)	16 (16%)
50–60 years	8 (16%)	5 (10%)	13 (13%)
Total	50 (100%)	50 (100%)	100 (100%)

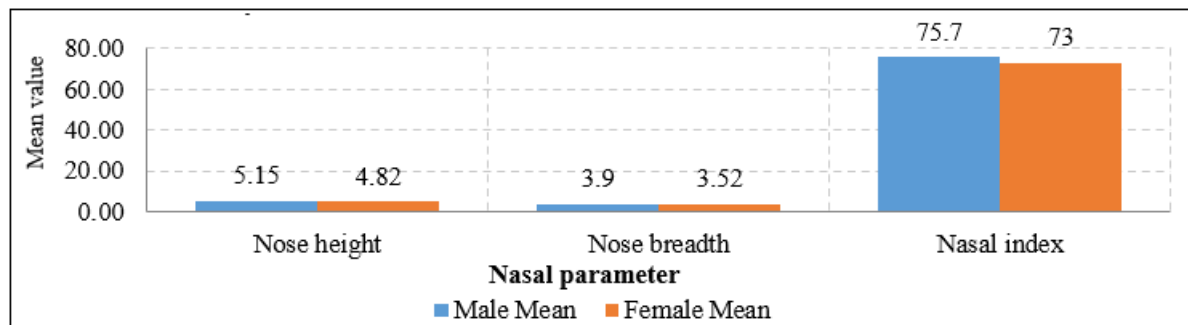


Graph 1: Age Distribution of Study Subjects

Table 2: Gender-wise Nasal Parameters

Parameter	Male Mean $\pm$ SD	Female Mean $\pm$ SD	p value
Nose height	5.15 ± 0.42 cm	4.82 ± 0.36 cm	0.04*
Nose breadth	3.90 ± 0.38 cm	3.52 ± 0.35 cm	0.02*
Nasal index	75.7 ± 6.8	73.0 ± 7.2	0.12

*Significant at $p<0.05$



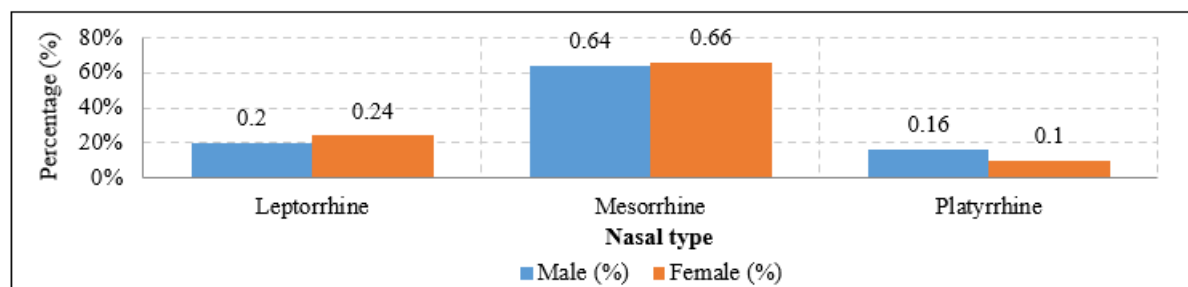
Graph 2: Gender-wise Nasal Parameters

Table 3: Classification of Nose Shape

Nose shape	Nasal index range	Description
Leptorrhine	≤69.9	Long and narrow nose
Mesorrhine	70–84.9	Medium nose
Platyrrhine	≥85	Broad nose

Table 4: Distribution of Nasal Shape in Males and Females

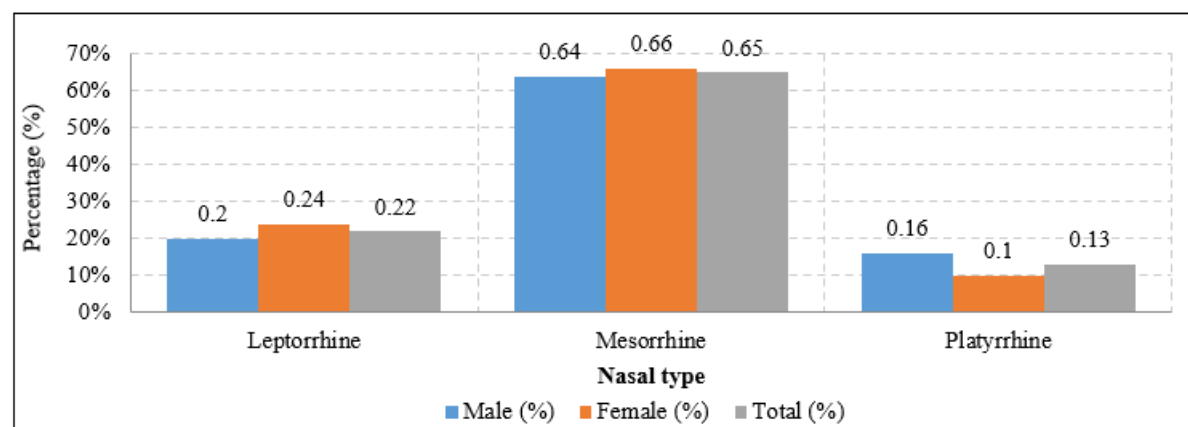
Nasal type	Male No. (%)	Female No. (%)
Leptorrhine	10 (20%)	12 (24%)
Mesorrhine	32 (64%)	33 (66%)
Platyrrhine	8 (16%)	5 (10%)
Total	50 (100%)	50 (100%)



Graph 4: Distribution of Nasal Shape in Males and Females

Table 5: Overall Nasal Shape Distribution

Nasal type	Male %	Female %	Total %
Leptorrhine	20%	24%	22%
Mesorrhine	64%	66%	65%
Platyrrhine	16%	10%	13%
Total	100%	100%	100%



Graph 5: Overall Nasal Shape Distribution

5. Discussion

The present study showed that the majority of subjects belonged to the younger adult age groups, especially 21–30

years (33%) and 31–40 years (24%). Similar age-group selection was reported by Ray et al., who studied nasal index in Western Uttar Pradesh among young adults, and Radha et al., who studied South Indian young adults. This shows that

nasal anthropometric studies commonly include young adults because they provide stable adult facial measurements.

In the present study, males had significantly greater nasal height and nasal breadth than females. Male nose height was 5.15 ± 0.42 cm, while female nose height was 4.82 ± 0.36 cm. Male nose breadth was 3.90 ± 0.38 cm, while female nose breadth was 3.52 ± 0.35 cm. These findings are similar to Sharma et al., who reported larger nasal dimensions in males of the Gwalior region. Ray et al. also found higher nasal index values in males than females in Western Uttar Pradesh.

The mean nasal index was 75.7 ± 6.8 in males and 73.0 ± 7.2 in females, but this difference was not statistically significant. This suggests that although males had larger absolute nasal dimensions, nasal proportions were comparable between genders. Similar observations were reported by Andhare et al., who found gender-based differences in nasal dimensions but insignificant difference in nasal index.

The most common nasal type in the present study was mesorrhine, seen in 65% of the total population. Mesorrhine type was also most common in males 64% and females 66%. These findings are comparable with Ray et al., who reported mesorrhine predominance in Western Uttar Pradesh, and Jasuja et al., who also found mesorrhine as the commonest nasal type in Central Uttar Pradesh. Thus, mesorrhine nasal morphology appears to be common in North Indian populations.

6. Conclusion

The present study concluded that the Jain population of North Rajasthan predominantly shows mesorrhine nasal morphology. Mesorrhine nose type was found in 65% of the total population, followed by leptorrhine in 22% and platyrrhine in 13%. This indicates that medium nasal type is the commonest nasal form in this community.

Males had significantly higher nasal height and nasal breadth than females, confirming the presence of sexual dimorphism in nasal dimensions. However, nasal index did not show a significant gender difference, suggesting that nasal proportions remain broadly similar in both sexes.

This study provides useful baseline anthropometric data for the Jain community of North Rajasthan. These findings may be helpful in forensic identification, facial reconstruction, rhinoplasty, plastic surgery and anthropological comparison. Further large-scale studies on different communities and regions are recommended to develop a more complete anthropometric database of Indian populations.

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