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Comparative Study of Nasal Index in Rajput (Rathore) and Brahmin (Pushkarna) Community of Bikaner

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Abstract

The nasal index measurement is one of the methods anthropologists have used to differentiate living race and subspecies of man. Ethnic influences can result in different appearances of the nose and can be found in many shapes and sizes.This study was conducted on 200 healthy people from which 100 subjects of the Brahmin (Pushkarna) and 100 subjects of Rajput (Rathore) community with age ranging from 18 to 45years were incorporated. All the subjects were bona fide residents of Bikaner.The nasal index was calculated as (Nasal height / Nasal Breadth) × 100 and their significance was tested by Student t-test. Results — Nasal index among the Brahmin (Pushkarna)and the Rajput (Rathore) were 73.89 and 79.14 respectively ($p<0.05$). The result of this study revealed significant difference in Nasal index of Brahmin (Pushkarna) and Rajput (Rathore) ethnic races. The study revealed the racial as well as sexual dimorphism pattern in nasal ergonomics in this ethnic group. The sex and ethnicity had considerable effect nasal ergonomics related anthropometric measurements.

Keywords: Nasal Index, Ethnicity, Anthropometry, Dimorphism, Nasal Anthropometry

Introduction

Anthropometry is a series of systematized measuring techniques that expresses quantitatively the dimensions of the human body and skeleton. Facial anthropometry has become an important tool used in genetic counseling, reconstructive surgery and forensic investigation[1-2].

The nose is considered as one of the best clues to racial origin[3]The nose can be categorized on the basis of Nasal parameters (Nasal height, Nasal width and nasal index); these three categories are commonly accepted[4-5]. Nasal analysis is the first step a surgeon takes before performing rhinoplasty (plastic surgery) to change the shape of the nose[6,7-8].

The nose is part of the respiratory tract superior to the hard palate which contains the peripheral organ of smell[9-10].There are certain variables that determines the shape of the nose, these variables includes: race, tribes and environmental climatic conditions[11] with narrower nose being favored in cold weather and dry climate and broader nose in warmer climate[12]. This is to say that nasal elongation is influenced by adaptation to environment[13]

The present study was carried out to establish and compare the nasal index of Brahmin (Pushkarna) and Rajput (Rathore) community of Bikaner district, so as to provide a baseline data of nasal indices, which could be of vital importance in forensic medicine, anthropological studies, various clinical approaches especially in surgeries related to nose.

Materials and Method

The present study was conducted at Department of Anatomy, S.P.Medical College and Associated Group of Hospitals, Bikaner with the prior approval of Hospitals Ethical Committee has been taken. In present study, 100 subjects of the Brahmin (Pushkarna) and 100subjects of Rajput (Rathore) community with age ranging from 18 to 45years were incorporated. Subjects who had trauma of nose, prior plastic or surgery of the face or cleft lips and other congenital facial malformation was excluded from the study.

Subjects were told to sit upright in a relaxed mood with head in ananatomical position. Nasal length was measured with the vernier caliper by placing the upper fixed divider arm of the caliper on the nasion(Midpoint of fronto nasal suture) of the nose superiorly and then the lower moveable divider arm on the pronasale (Tip of the Nose). The nasal breadth (maximum breadth of the nose) or nasal width was measured at right angle to the nasal length from ala to ala. The readings were taken in centimeters, converted to millimeters and the data were recorded on the data sheet.Nasal Index was calculated using the formulae:

Nasal Index =Nasal width/Nasal length x 100. The collected data were analyzed by using appropriate statistical softwares.

Observation

In Present Study overall mean nasal index in Brahmin (Pushkarna) community was 73.89±9.93 mm while in Rajput (Rathore) community was79.14±8.79 mm and this difference was found statistically highly significant (p<<0.05). Brahmin (Pushkarna) and Rajput (Rathore) Both Communities have mesorrhine nose type with Rajput (Rathore) having slightly larger nose than Brahmin (Pushkarna) community of Bikaner district.

Distribution of Cases according to Nasal length in Relation to Rajput (Rathore) and Brahmin (Pushkarna) Community:

Table 1

Nasal Legth (mm)	Community				Total	
	Brahmin		Rajput			
	No.	%	No.	%	No.	%
≤35.00	3	75.00%	1	25.00%	4	3.5%
35.10-37.50	5	71.43%	2	28.57%	7	27%
37.60-40.00	20	37.03%	34	62.97%	54	27%
40.10-42.50	21	47.73%	23	52.27%	44	22%
42.60-45.00	17	41.47%	24	58.53%	41	20.5%
45.10-47.50	21	67.75%	10	32.25%	31	15.5%
47.60-50.00	13	68.43%	6	31.57%	19	9.5%
Total	100	50.00%	100	50.00%	200	100%
Mean	42.6		41.8			
SD	4.0		3.4			
P	0.086					

On Statistical analysis, overall mean nasal length in:- Brahmin (Pushkarna) community - 42.6±4 mm, Rajput (Rathore) community- 41.8±3.4 mm

The difference was found statistically insignificant (p>0.05)

Distribution of Cases according to Nasal Breadth in Relation to Rajput (Rathore) and Brahmin (Pushkarna) Community:

Table 2

Nasal Legth (mm)	Community				Total	
	Brahmin		Rajput			
	No.	%	No.	%	No.	%
≤25.00	4	66.67%	2	33.33%	6	3%
25.10-27.50	26	74.28%	9	25.72%	35	17.5%
27.60-30.00	15	44.11%	19	55.89%	34	17%
30.10-32.50	10	83.33%	2	16.67%	12	6%
32.60-35.00	18	56.25%	14	43.75%	32	16%
35.10-37.50	13	39.39%	20	60.61%	33	16.5%
37.60-40.00	14	29.16%	34	70.84%	48	24%
Total	100	50.00%	100	50.00%	200	100.00%
Mean	31.4		34.3			
SD	4.8		4.7			
P	0.0001					

On Statistical analysis, overall mean nasal breadth:-

Brahmin (Pushkarna) community - 31.4±4.8 mm

Rajput (Rathore) community - 34.3±4.7 mm

The difference was found statistically highly significant ($p<0.05$)

Distribution of Cases according to Nasal Index in Relation to Rajput (Rathore) and Brahmin (Pushkarna) Community

Table 3

Nasal Legth (mm)	Community				Total	
	Brahmin		Rajput			
	No.	%	No.	%	No.	%
≤69.99 Leptorrhine	31	81.57%	7	18.43%	38	19.00%
70.00-84.99 Mesorrhine	55	50.45%	54	49.55%	109	54.50%
≥85 platyrrhine	14	26.41%	39	73.59%	53	26.50%
Total	100	50.00%	100	50.00%	200	100.00%
Mean	73.89		79.14			
SD	9.93		8.79			
P	0.001					

On Statistical analysis, overall mean nasal index in:-

Brahmin (Pushkarna) community - 73.89±9.93 mm

Rajput (Rathore) community - 79.14±8.79 mm

The difference was found statistically highly significant ($p<<0.05$)

Discussion

The nasal framework is described by nasal index. Anthropometric studies are useful in quantitative comparison of anthropometric data with patients, measurements before and after surgery which help in further planning and assessment of plastic & reconstructive surgery. The diversity of various measurements can be used in criminological clinical, eugenics anthropometry, forensic anthropology and also scientific research.

In present study, we found that In Brahmin (Pushkarna) community out of 100 subjects31subjects had their nasal index ≤69.99, 55subjects had their nasal Index 70.00-84.99, and 14 subjects had their nasal Index ≥85, while in Rajput community 07subjects had their nasal

Index ≤69.99, 54subjects had their nasal Index70.00-84.99 and 39 subjects had their nasal Index ≥85.

Statistical comparison showed a highly significant difference ($p<<0.05$) in nasal index between two communities where overall mean nasal index in Brahmin (Pushkarna) community was 73.89±9.93 while in Rajput (Rathore) community was79.14±8.79.

In 2013 similar study in two different ethnic groups was conducted by Kaushal et al[15] in which overall mean Nasal Index in females of Brahmin was 69.89±6.04, in females of Majhabi-Sikhs was 68.95±6.22 and in females of Muslims was 69.38±8.09. Highly significant difference ($p<<0.05$) was found in nasal index among Brahmins, Majhabi-Sikhs and Muslims.

Comparison of Nasal Index in Different Population

Table 4

Population	Author	Year	Nasal Index	Type of Nose
Lebanon	Daniel[13]	2002	63.30	Leptorrhine
Arabic	Daniel[13]	2002	74.48	Mesorrhine
Indo-Aryans	Risely[17]	1915	73.25	Mesorrhine
African Americans	Porteret al[18]	2001	79.70	Mesorrhine
Rajputs	Mulchand[16]	2004	71.60	Mesorrhine
Nigerian Ogonis	Oladipo et al[1]	2007	98.50	Platyrrhine
Brahmin (Pushkarna)	Present Study	2019	73.89	Mesorrhine
Rajput (Rathore)	Present Study	2019	79.14	Mesorrhine

The NI calculated by different authors on different races were compared along with their nose type in above table. It shows that overall most common nose was Mesorrhine type.

These studies can be used for identification analysis. The studies when repeated on the same study group after many years will help to detect any micro evolutionary changes. These studies have anthropological importance also. As limited data is available on nasal index of Rajput and Pushkarna Brahmin community in Bikaner and considering the importance of NI in forensic and reconstructive surgery.

Conclusion

1. The overall average nasal index in Brahmin (Pushkarna) community of Bikaner district of Rajasthan was higher (73.89±9.93) than in Rajput (Rathore) community of Bikaner district of Rajasthan was (79.14±8.79)
2. Brahmin (Pushkarna) and Rajput (Rathore) Both Communities have mesorrhine nose type with Rajput (Rathore) having slightly larger nose than Brahmin (Pushkarna) community of Bikaner district.
3. The Rajput (Rathore) and the Brahmin (Pushkarna) males fall within the mesorrhine nose type while the Brahmin (Pushkarna) females fall within the Leptorrhine nose type.
4. The present study has so far shown that in each community irrespective of their location has a characteristic nose pattern different from other community occupying the same location.
5. Sexual dimorphism was observed in both the community as the over all average nasal index of males in both Rajput & Brahmin communities is (80.68±9.28) greater than the nasal index of females (74.64±10.59) of both communities.

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