ORIGINAL RESEARCH

Evaluation of Nasal Morphological Characteristics of a Known Population: An Institutional Based Study

[1]Mohammad Farhan Rashid Hamid, [2]Salahuddin Azeemuddin

[1,2]Assistant Professor, Department of Anatomy, LN Medical College and Research Center, Bhopal, Madhya Pradesh, India

Corresponding Author
Salahuddin Azeemuddin
Assistant Professor, Department of Anatomy, LN Medical College and Research Center, Bhopal, Madhya Pradesh, India
Email: drsap82@gmail.com

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ABSTRACT

Background: Because of its tetrahedral shape, the width, height, and location of the tip of nose are essential data to estimate nasal profiles. The present study was conducted to evaluate the nasal morphological characteristics of a known population.**Materials& Methods:**The present study was conducted on 100 randomly selected persons aged 18-60 years. The standard spreading caliper with scale was used for the measurement of nasal parameters. The anthropometric measurements taken were nasal height, nasal breadth, and Nasal index. According to the nasal index, the nose was classified. The differences in mean values of nasal height, nasal breadth and nasal index were tested for statistical significance by independent sample t-test.**Results:**Nasal height, nasal breadth and nasal index of males was more than female. The result for Nasal height, nasal breadth and nasal index was statistically significant. Females had more leptorrhine type of nose than males. Males had more mesorrhine and platyrrhine type of nose than females. The difference for leptorrhine, mesorrhine and platyrrhine type of nose was statistically significant.**Conclusion:**The study concluded thatNasal height, nasal breadth and nasal index of males was more than female. Females had more leptorrhine type of nose than males. Males had more mesorrhine and platyrrhine type of nose than females.

Keywords: Nasal Height, Nasal Breadth, Nasal Index, Nose.

INTRODUCTION

Nose is a pyramidal structure located in the midline of the mid-face and attached to the facial skeleton made up of bones, cartilages, muscles, and soft tissue.[1] The nose constitutes the most prominent part of the profile and occupies the most visible position in the face.[2] Human nose, because of its anatomical position forms an epicentre for facial aesthetics and soft tissue harmony.[3]The size and the shape of the nose have been used for differentiation of human races, among the other parameters.[4] The nasal index, as the ratio between nasal height and nasal width, multiplied by 100 is the most commonly used parameter in nasal anthropometry. It is based on both bony and cartilaginous landmarks, which makes it different from most other anthropological indices.[5] Based on the nasal index, the general nose shape was determined to be one of the following types. 1.Hyperleptorrhine(≤54.9) – Very long and narrow nose 2. Leptorrhine (55–69.9) – Long and narrow nose3.Mesorrhine (70–84.9) – Moderate nose of moderate size 4. Platyrrhine (85–99.9) – Broad nose 5. Hyperplatyrrhine (≥100) – Very broad nose.[6] Any alteration in the shape of the nose leads to a gross change in the facial appearance of an individual. Hence, population-specific data regarding the nasal morphology are of utmost importance for the plastic surgeons in reconstructive studies and forensic investigators in facial identification and reconstructions. In any nasal reconstructive procedure, there should be a thorough analysis of the nasal morphology of population of a particular geographic area. Hence, plastic surgeons and forensic investigators both can benefit from a regional database regarding nasal anthropometry.[7] The present study was conducted to evaluate the nasal morphological characteristics of a known population.

MATERIALS& METHODS

The present study was conducted in the Department of Anatomy, LN Medical College and Research Center, Bhopal, Madhya Pradesh (India) on 100 randomly selected persons aged 18-60 years. Before the commencement of the study ethical clearance was taken from the Ethical Committee of the institute and informed consent was taken from the participants after explaining them the study. Participants with past and existing craniofacial trauma, with deformity and facial scars were excluded. All measurements were performed in the same way and under the same conditions. The subjects were in a sitting position, in a relaxed condition, with the head in the correct anatomical position (neutral position of the head). The standard spreading caliper with scale was used for the measurement of nasal parameters. Landmark points used in measuring of the parameters were the nasion (n) – the midpoint of the nasofrontal suture and the subnasale (sn) – in the midline, the junction between the lower border of the nasal septum and the cutaneous portion of the upper lip. The anthropometric measurements taken were nasal height (NH) – distance between nasion (n) and subnasale (sn) and nasal breadth (NB) – distance between the two alae nasi (al). The nasal breadth (maximum breadth of the nose) was measured at a right angle to the nasal height from ala to ala. The nasal height was measured from nasion to nasospinale. Nasal index (NI) presents the ratio between nasal breadth (NB) and nasal height (NH) and can be calculated according to the formula of Romo and Abraham (2003)[8]:

Nasal index (NI) = nasal breadth (NB) / nasal height (NH) x 100

According to the nasal index (NI), the nose was classified as leptorrhine – fine (NI $\leq$ 69.90), mesorrhine – medium (70.0 $\leq$ NI $\leq$ 84.90) or platyrrhine – broad (NI $\geq$ 85.0)[9].

The differences in mean values of nasal height, nasal breadth and nasal index were tested for statistical significance by independent sample t-test.

RESULTS

Nasal height, nasal breadth and nasal index of males was more than female. The difference for Nasal height, nasal breadth and nasal index was statistically significant.Females had more leptorrhine type of nose than males. Males had more mesorrhine and platyrrhine type of nose than females. The difference for leptorrhine, mesorrhine and platyrrhine type of nose was statistically significant.

Table 1: Nasal parameters of the population

Parameter	Male	Female	p-value
Nasal height (NH) mm±SD	55.36±3.50	53.81±4.65	<0.001*
Nasal breadth (NB) mm±SD	37.5±2.83	35.76±3.33	<0.001*
Nasal index (NI)	68.51±6.09	67.43±8.17	<0.001*

Table 2: Categories of nasal type according to nasal index of the population

Nose type	Male(%)	Female(%)	p-value
Leptorrhine	36%	41%	<0.001*
Mesorrhine	9%	6%	<0.001*
Platyrrhine	6%	1%	<0.001*

DISCUSSION

Nasal index is a request of facial triad its and internationally accepted parameter for racial origin.[10] Nasal bone is an important structure in the shape of entire nose. It is bordered superiorly by the frontal bone, laterally by the maxillary bones, and inferiorly by the pyriform aperture.[11] The size and morphology of nasal bone vary between different races, ethnic groups, genders, and ages.[12]

Nasal height, nasal breadth and nasal index of males was more than female. The result for Nasal height, nasal breadth and nasal index was statistically significant. Females had more leptorrhine type of nose than males. Males had more mesorrhine and platyrrhine type of nose than females. The difference for leptorrhine, mesorrhine and platyrrhine type of nose was statistically significant.

Jovanovic J et al (2014) determined the nasal parameters in the population of central Serbia and to compare them with those determined in earlier studies in different populations. There were significant differences in the nasal parameters between male and female subjects. The nasal breadth was 34.72 mm in females, and in the male population it was 36.7 mm. The mean values of nasal height were 52.6 mm and 54.32 mm in females and males, respectively. The nasal index in females and males was 66.01 and 67.56, respectively, and the mean value of the nasal index of all respondents was 66.78. After conducting the research it was concluded that the dominant nasal type in the population of the central part of Serbia is leptorrhine.[13]

Marini MI et al, 2020 found that the nasal index mean and SD of males and females were 77.87 ± 10.8 and 78.46 ± 7.97 respectively. The dominant type of nasal shape for Dayak Kenyah males and females was mesorrhine with the second most common type was platyrrhine.[14]

Rohith MM, et al 2020 found that the mean nasal width for male and female was 38.23 mm and 34.94 mm while the mean nasal height was 47.59 mm and 44.35 mm, respectively. The mean nasal index for

male subjects (81.08) was also higher than for female subjects (77.30). The morphological classification showed the mesorrhine nose type as the most prevalent among both the males (58.88%) and females (66.66%). [7]

CONCLUSION

The study concluded thatNasal height, nasal breadth and nasal index of males was more than female. Females had more leptorrhine type of nose than males. Males had more mesorrhine and platyrrhine type of nose than females.

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