Assessment of nose width in western Maharashtra population: A crosssectional study

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Abstract:
Introduction: Facial anthropometry is an important tool in forensic medicine, genetic counseling, reconstructive surgeries and certain manufacturing industries. One of the commonest parameter studied is nose width. Hence the present study was carried out to study the nose width in western Maharashtra population. Material and methods: The present crosssectional study was performed on 100 males and 100 females of 18-25 years of age. The study population were the students from the dental, medical and nursing colleges in Mumbai and surrounding region. Subjects were selected according to predefined inclusion and exclusion criteria. The measurements were obtained using sliding vernier calliper, transparent protractor, measuring ruler and stadiometer. Width of nose is measured as the straight distance between the two alae. Results: In males, maximum nose width was recorded in interval of 35.1 – 38.0 mm (40%) and minimum nose width in interval of 44.1 – 47.0 mm (2%). In females, maximum nose width was recorded in interval of 32.1 – 35.0 mm (45%) and minimum nose width in interval of 41.1 – 44.0 mm (1%). In total group, 35% had nose width in interval 35.1 – 38.0 mm while 1% had their nose width in interval of 44.1 – 47.0 mm. Conclusion: The results of the study provide an important data for forensic investigations, physical anthropometry data base and to guide surgeons in rhinoplasty, nasal reconstructions.

Key words: Facial anthropometry, width of nose, Vernier caliper, Western Maharashtra

Introduction:
Nose is the most obvious and may be the first fascinating feature of the face. Concerning the nose location, it is present in the central position along the geometrical division of the face. It’s a two chambered organ, divided in proportion by a septum, rightly contributing for the overall beauty of human. Racial origin can be commented upon by careful examination of different features of nose. Each race has got specific nasal features whether Caucasian, Africans or Asians. Each race has its own special beauty. Like in Caucasian, the nasal bridge is high, straight and slim with the naso-labial angle of 90 to 100 degrees in the males and up to 120 degrees in the females and having golden triangle tilt at the tip. In Africans, the bridge height is low with broad tip, short columella and the flared nostrils. While in Asians, the nose seems to lie between Caucasians and Blacks in bridge height, tip width, columella length and alar flare [1,2]. There are wide variations in the nose morphology depending upon age, sex, ethnic group and race. External environment, climate and socioeconomic status are also seen to play an important role in determining the nasal features, narrower nose being favoured in cold weather and dry climate and broader nose in warmer climate [3,4]. Facial anthropometry has become an invaluable tool in forensic medicine. It is also useful in genetic counselling, reconstructive surgeries. It is a scientific art to reconstruct the face for forensic purpose or in plastic surgery. What it requires is to visualise faces on bony framework of face. One of the important facial anthropometric parameter studied is width of nose. It is one of the first points we notice in face. [5-9]. To achieve this goal, baseline data on facial parameters and indices will be helpful. Thus the present study was carried out to study the nose width in western Maharashtra population.

Materials and Methods:
The present crosssectional study was performed on 100 males and 100 females of 18-25 years of age. The study population were the students from the
dent dental, medical and nursing colleges in Mumbai and surrounding region. The subjects who were residents of Western Maharashtra region like Mumbai, Thane, Ratnagiri, Raigad and Sindhudurg districts were included for the study. The subjects who have undergone any facial plastic or reconstructive surgery, subjects having history of nasal trauma either acquired through road traffic accidents or any other forms of trauma, subjects having any obvious nasal deformity like congenital or developmental discrepancies were excluded from the study. The study procedure was explained to each participant in detail and written informed consent was obtained prior to the measurements. The study was approved by institutional ethics committee. The measurements were obtained using sliding vernier calliper, transparent protractor, measuring ruler and stadiometer. Before listing the measurements made to determine the various dimensions of the nose, it is necessary to define the landmarks from which such measurements are conventionally made [2,10].

Ala (al) Left and Right – The classical anthropometric landmark of the nasal wings at the most lateral point of the outer surface.

**Width of the nose (al to al):**

It is measured as the straight distance between the two alae.

**Statistical analysis:**

All the data was collected and tabulated on excel sheet. The values in the study were expressed in terms of mean and standard deviation (SD) by using Microsoft Excel software. The data was a quantitative type of data. The data was analysed by using statistical software named “Graphpad instat, version 3, California, Sandiago”. For comparison between different values in different groups unpaired ‘t’ test was applied. P value < 0.05 was considered to be significant.

**Results:**

**Table 1: Nose width measurements in 200 subjects**

<table>
<thead>
<tr>
<th>Class intervals of nose width (mm)</th>
<th>Males</th>
<th>Females</th>
<th>Total group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>29.1 – 32.0</td>
<td>04</td>
<td>04</td>
<td>20</td>
</tr>
<tr>
<td>32.1 – 35.0</td>
<td>17</td>
<td>17</td>
<td>45</td>
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<tr>
<td>35.1 – 38.0</td>
<td>40</td>
<td>40</td>
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<tr>
<td>38.1 – 41.0</td>
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<td>41.1 – 44.0</td>
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<tr>
<td>44.1 – 47.0</td>
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</table>

In males, maximum nose width was recorded in interval of 35.1 – 38.0 mm (40%) and minimum nose width in interval of 44.1 – 47.0 mm (2%). In females, maximum nose width was recorded in interval of 32.1 – 35.0 mm (45%) and minimum nose width in interval of 41.1 – 44.0 mm (1%). In total group, 35% had nose width in interval 35.1 – 38.0 mm while 1% had their nose width in interval of 44.1 – 47.0 mm.

**Graph 1: Percentage distribution of nose width**

![Graph 1: Percentage distribution of nose width](image)

**CLASS INTERVAL OF NOSE WIDTH (mm)**

**Discussion:**

In the present study, the total group, male group and female group show mean width of the nose (± SD) of 35.9 ± 3.0 mm, 37.4 ± 2.9 mm and 34.3 ± 2.3 mm respectively. The width of the nose shows extremely significant statistical difference (p = 0.0001) when the male and female groups are compared.

The values of width of the nose measured by previous researchers and the present study are as follows.

Kurulkar GM and colleagues reported the width of nose as 35.6 ± 2.4 mm32.6 ± 2.5 mm respectively in 200 adult Bombay populations [11]. Khandekar et al studied lip nose complex in 100 subjects of different age group from western Maharashtra population particularly from Mumbai. They reported that there is a similarity in columellar width between Chinese and Indians. Nasal width is more in Indian males compared to Indian females at all the age groups. Nasal width is found to maximum amongst blacks compared to Indians and Caucasions at all the ages [12].

Our study results suggest that the Indian population, particularly western Maharashtra population has difference in width of nose than the subjects examined by various researchers. The difference in nose width measured by previous workers and the present study is because of racial and regional variations. The values for nose width in the
male group of the present study lie in between the values recorded by Farkas LG et al (1986), Hoffman BE et al (1991), Oladipo GS et al (2009), Garandawa HI et al (2009). It shows that the Indian noses are broader than the white or Caucasian noses while the black or Negroid noses are the broadest. The same is observed among the females of different communities and the races [13-17].

**Conclusion**

The parameters evaluated in this study are comparable with previous studies and provide an important data for forensic investigations, physical anthropometry data base and to guide surgeons in rhinoplasty, nasal reconstructions.

**Limitations of the study**

There is a need to study larger samples to establish ethnic norms from nasal parameters and nasal index for the entire Indian population of different age groups and in both sexes that may not have manifested in this small study.

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**References:**