Aesthetic Proportions of the Nasal Aperture in 3 Different Racial Groups of Men

Maged Abdelkader, FRCS; Samuel Leong, MB, ChB; Paul S. White, FRACS, FRCS(Edin)

Objective: To define baseline aesthetic dimensions of the nasal aperture in 3 different racial groups.

Methods: Healthy volunteers from 3 different racial groups (15 white, 15 Chinese, and 15 Indian men) were enrolled in the study at the Department of Otolaryngology, University of Dundee, Dundee, Scotland. Those with a history of nasal or facial surgery or trauma were excluded from the study. Images were obtained and stored in a digital format. The dimensions of nasal aperture were defined by the length of the columella at the narrowest point, the width of the columella at the narrowest point, the length of the nasal aperture at the maximum length, the width of the nasal aperture at the maximum width, and the width of the alar cartilage base.

Results: There was no significant difference in the length or the width of the columella for the 3 racial groups. There was no significant difference in the length of the nasal aperture between the Chinese and the white groups. The nasal aperture was longer in the Indian group compared with the other 2 groups \(P<.002\). The nasal aperture at the maximum width was narrower in the Chinese group compared with the other groups \(P<.002\); there was no significant difference between the white and Indian groups. The nasal alar width was slightly narrower at the alar base in the Chinese group compared with other racial groups \(P<.001\).

Conclusions: The aesthetic dimensions of the nasal aperture differ between racial groups. The nasal aperture and the alar base were narrower in the Chinese group, and the nasal aperture was longer in the Indian group. The aesthetic surgeon should ideally have an understanding of these ethnic variations.

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A change in the shape of the nasal aperture is a frequent and sometimes unrecognized consequence of rhinoplasty. This change is especially noticeable following surgical reconstruction of saddle deformity, which often includes lengthening the columella and changing the shape of the aperture from circular to ovoid (Figure 1).1

Recent trends in ethnic rhinoplasty indicate that nonwhites increasingly prefer an aesthetic outcome in keeping with their ethnic group. Given that, surgeons should have a broad understanding of nasal aesthetic dimensions that are ethnically specific.2 Because the standards for modern rhinoplasty most frequently are derived from an aesthetic ideal rather than from normal data, the current surgical goals of rhinoplasty are often heavily influenced by artistic and cultural views of beauty.3

There are few reports in the medical literature concerning rhinoplasty that specifically address particular ethnic groups.4 Studies of different dimensions of the nasal aperture in the literature are scarce.

Farkas et al5 and Le et al6 studied different types of nostrils in different ethnic groups, and their data about nostril types and the soft nose may provide important guidelines for reconstructive and cosmetic surgery. Vitte et al7 studied the piriform aperture of 100 skulls and suggested that the form and dimensions of the piriform aperture depend on the ethnic origin and not the cranial anthropologic type.

The purpose of this study was to collect and compare different aesthetic dimensions of the nasal aperture in male Chinese, Indian, and white volunteers.

METHODS

Ethical approval was obtained from the Tayside Committee on Medical Research Ethics, Dundee, Scotland. Volunteers were chosen from staff and students at Ninewells Hospital and

Author Affiliations:
Department of Otolaryngology,
University of Dundee,
Ninewells Hospital, Dundee,
Scotland.
Medical School, Dundee. Subjects with a history of nasal or facial trauma or surgery were excluded from the study. To overcome the variations due to sex, this study was restricted to males. The Chinese cohort was restricted to individuals with southern Chinese ancestry, and the Indian cohort was restricted to those with Indian subcontinent ancestry.

In the images obtained using a digital camera (Kodak DC280 Zoom, Eastman Kodak Co, Rochester, NY), volunteers held a centimeter ruler in a perpendicular plane to the face. Basilar photographs were taken at a distance of 1.5 m and stored digitally as black-and-white JPEG files. Photographs were enlarged to a life-size scale on a computer screen and analyzed. We measured the following: length of the columella, width of the columella at the narrowest point, length of the nasal aperture at the maximum length, width of the nasal aperture at the maximum width, and the basal width of the nasal alar base (Figure 2).

There were 15 subjects in each of the 3 racial cohorts. Data were analyzed by 1-way analysis of variance test.

**RESULTS**

The results showed no significant difference in the length or width of the columella at its longest or widest point for all 3 racial groups. The nasal aperture was longer at the maximal length in the Indian group compared with the other groups, but no significant difference was noted for nasal aperture length in the Chinese and white groups. The nasal aperture at the maximum width was narrower in the Chinese group compared with the other groups, but no significant difference was noted in the white and Indian groups. The width of the alar cartilage base was slightly narrower in the Chinese group compared with the other racial groups (Table).

**COMMENT**

In general, patients seeking rhinoplasty want nasofacial harmony. Given the wide variations in aesthetic parameters across different ethnic groups, surgeons need to have a wide understanding of nasofacial dimensions. Reshaping the ethnic nose according to the ideal for whites will not achieve nasofacial harmony if the patient prefers an ethnic ideal. Changes in the shape of the nasal aperture may be an intended or unintended outcome of rhinoplasty, yet studies of different dimensions of nasal aperture are scarce in the literature.

This study was designed to identify the difference in the proportions of nasal aperture between men of 3 different racial backgrounds. We found no significant differences in the length or width of the columella; however, the average nasal aperture was longer in the Indian group. The nasal aperture and alar cartilage base in the

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (SD) [Median], cm</th>
<th>Chinese (n = 15)</th>
<th>Indian (n = 15)</th>
<th>White (n = 15)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of the columella</td>
<td>1.79 (0.35) [1.70]</td>
<td>1.87 (0.30) [1.80]</td>
<td>1.85 (0.28) [1.81]</td>
<td>.74</td>
<td></td>
</tr>
<tr>
<td>Width of the columella</td>
<td>0.62 (0.12) [0.70]</td>
<td>0.64 (0.11) [0.70]</td>
<td>0.62 (0.12) [0.56]</td>
<td>.88</td>
<td></td>
</tr>
<tr>
<td>Length of the nasal aperture</td>
<td>1.19 (0.10) [1.20]</td>
<td>1.40 (0.05) [1.41]</td>
<td>1.21 (0.17) [1.20]</td>
<td>&lt;.002</td>
<td></td>
</tr>
<tr>
<td>Width of the nasal aperture</td>
<td>0.40 (0.12) [0.38]</td>
<td>0.64 (0.11) [0.70]</td>
<td>0.65 (0.12) [0.71]</td>
<td>&lt;.002</td>
<td></td>
</tr>
<tr>
<td>Width of the alar cartilage base</td>
<td>1.20 (0.04) [1.20]</td>
<td>1.35 (0.06) [1.34]</td>
<td>1.35 (0.06) [1.34]</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>
Chinese group showed variations compared with the other groups. This interracial difference is not surprising. Wang et al\(^8\) compared the validity of 4 neoclassical canons of facial proportion in Chinese and North American white populations. They noted that the nose width corresponded to one quarter of the face width (the nasofacial canon) significantly more frequently in Chinese participants than in white adults. In defiance of the naso-oral canon, they noted that the mouths of Chinese people were significantly more often narrower than 1.5 times the nose width, while in North American white subjects the mouth was significantly more frequently wider.

Even in the same race, variations exist. Milgrim et al\(^9\) suggested that in general Latino noses can be anthropometrically categorized as mesorrhine and advised that surgical correction should be individualized, as each group requires correction of different nasal features. Although it is difficult to define specific ethnic groups as there are multiracial mixtures determined by historical, geographical, and cultural factors, blending the new nose with the ethnic features to achieve harmony in the facial aesthetic components is strongly emphasized.\(^10\)

Additional larger-scale studies on the structure of the ethnic nasofacial dimensions are required to define some consistent landmarks (ie, to determine if norms exist) and to guide the surgeon in achieving nasofacial harmony. Aesthetic surgery should be tailored to the individual’s needs and realistic expectations and not to the dimensions of neoclassical facial canons.

In conclusion, the aesthetic dimensions of the nasal aperture differ. Understanding the variation between nasal proportions in different ethnic groups is paramount before surgery. More research is required to identify normative values of nasal and facial aesthetic proportions in different ethnic groups.

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**Correspondence:** Maged Abdelkader, FRCS, Department of Otolaryngology, Ninewells Hospital, Dundee DD1 9SY, Scotland (mabd007@hotmail.com).

**REFERENCES**