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Anthropometric analysis of the nose in young Turkish men and women



Fikri Ozdemir, Ahmet Uzun*

Department of Anatomy (Chair: Prof. Dr. A. Uzun), Faculty of Medicine Ondokuz Mayıs University, 55200, Atakum, Samsun, Turkey

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ABSTRACT

Purpose: The aim of the study was to describe and compare values for nasal anthropometric measurements using the landmark-based geometric morphometric technique in young healthy Turkish men and women.

Materials and methods: A total of 115 young adults (56 men and 59 women) whose ages ranged from 18 to 30 years (mean age 21.22 years) were included in the analysis.

Results: For men the mean nasal bridge length, total length, width and root width were 52.95, 54.38; 35.24 and 17.83 mm, respectively, and in women they were 47.81 and 50.90; 31.59 and 17.36 mm, respectively. The columella length and width were 12.76 and 5.77 mm, respectively, for men, and for women they were 11.88 and 5.60 mm, respectively.

Conclusion: Data collected in the present research could serve as a database for the quantitative description of nasal morphology in young Turkish adults. It may also be used in sex based data banks for the Turkish population.

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1. Introduction

The nose is one of the most visible organs on the face and its appearance contributes enormously to facial aesthetics (Szychta et al., 2011). Clinicians, scientists and artists have always studied the human face and nose: the anatomical bases of communication and environment interaction; the phenotype for personal identification; and the key characteristics that depict the health state of an individual, have all been considered from both qualitative and quantitative points of view (Davis, 1987; Han et al., 2010). Additionally, nasal dimensions are used to provide guidelines for treatment planning. The proportions of the so-called ideal nasal shape and the operations designed to achieve these have been the subject of numerous papers (Spalding and Vig, 1990). The right size, shape, and proportions of a nose help to make a person beautiful or handsome, because it is at the center of the face (Echinard and Dantzer, 1995; Fedok et al., 2001; Husein et al., 2010).

The shape of the nose is a signature, indicating ethnicity, race, age and sex. Knowledge of the unique shape, anatomy and

dimensions of the nose would be very useful for surgeons undertaking repair and reconstruction of the nose (Farkas et al., 2005; Mori et al., 2005; Uzun et al., 2006; Nagasao et al., 2008). There are few comparisons in Turkish literature of the mean nasal anthropometric measurements for young men and women. Anthropometric parameters vary with age, sex and ethnic background; several authors have undertaken to document normative values which may serve as reference index populations (Dong et al., 2010; Sforza et al., 2010).

Data collected in the present investigation could provide a database for surgeons. Knowing the average nasal measurements for a given population is useful (Uzun et al., 2006), we believe that this data may further contribute to satisfactory results in cosmetic and reconstructive nasal surgery in the Turkish population.

2. Materials and methods

A study group consisting of 115 healthy, university student volunteers, 56 men and 59 women (age range 18–30 years; mean age 21.22 years), were selected using a simple random sampling method. All of the students were ranked by their university number; grouped according to their sex, and listed in the Statistical Package for Social Sciences (SPSS Version 18.0) for Windows, then

* Corresponding author. Tel.: +90 362 312 19 19x2269; fax: +90 362 457 60 41.
E-mail address: auzun@omu.edu.tr (A. Uzun).

10% of the students were selected randomly from the list by SPSS. Any selected students who had noticeable nasal or facial disfigurement, or previous nasal or facial surgery, were excluded. All participants signed an informed consent form.

Body weight was measured using Seca scales (Seca, Mod 220, sensitive to 0.1 kg, Hamburg, Germany) with the subject barefoot and wearing as few clothes as possible. Body height was measured (in centimeters), standing in an anatomic position using a portable stadiometer (Seca), sensitive to 0.5 cm (Uzun et al., 2006). The mean body weight and height of the men were 77.34 kg (range 53.40–112.20 kg) and 177.02 cm (range 163.00–194.00 cm). For the women, the mean body weight and height were 59.32 kg (ranging 38.40–86.00 kg) and 164.83 cm (range 150–182 cm). The mean body mass indexes for men and women were 21.84 kg/m² (range 16.95–18 kg/m²) and 24.65 kg/m² (range 18.92–36.51 kg/m²) respectively.

Anthropometric data were obtained from all subjects, using standard anthropometric methods and instruments described in the literature (Farkas, 1994). The measurements were in millimeters and were made by the same author (FO) with the subject adopting a normal anatomic position and the Frankfurt horizontal plane.

The following reference points were used: Nasion (n): the point in the midline of both the nasal root and the nasofrontal suture; Subnasale (sn): the midpoint of the columella base; Pronasale (prn): the most prominent point on the nasal tip; Maxillofrontale (mf): where the maxillofrontal and nasofrontal sutures meet; Alare (al): the point where the nasal blade (ala nasi) extends farthest out; Alar curvature (ac): the most lateral point in the curved base line of each ala; Subalare (sbal): the point at the lower limit of each alar base; Alare' (al'): the marking level at the midportion of the alare (al'–al') where the thickness of each ala is measured; Highest point of the columella (c): the point on each columella crest; Columella' (c') indicates the midpoint of the columella where the width of the columella is measured (Uzun et al., 2006).

In the present study, the parameters measured and noted were: the total nasal length, nasion–subnasale (n–sn); nasal bridge length, nasion–pronasale (n–prn); nasal root width, maxillofrontale–maxillofrontale (mf–mf); morphological width of the nose, alare–alare (al–al); anatomic nose width, alar curvature–alar curvature (ac–ac); nasal tip protrusion, subnasale–pronasale (sn–prn); soft tip width of the nose total nostril floor width, subalare–subalare (sbal–sbal); alar length, alar curvature–pronasale (ac–prn); alar thickness, alare'–alare' (al'–al'); columella length, subnasale–columella (sn–c) and width of the columella, columella'–columella' (c'–c'). Landmarks of the measurement points are shown in Fig. 1A–C. The landmarks and the methodology have been previously described (Farkas, 1994; Uzun et al., 2006).

The data were analyzed using SPSS for Windows. Differences in the distributions of anthropometric measurements of the nose between men and women were tested by Student's *t*-test for independent samples (for normally distributed variables) and by Mann–Whitney U test for independent samples (where the variables were not normally distributed) (Pelin et al., 2009). For all tests the level of significance was set to 5%. Values were expressed as mean ± standard deviation (SD).

The present study was conducted in accordance with the standards of the Clinical Research Ethics Committee of the University of Ondokuz Mayıs (Ethics Committee number: 569).

3. Results

The mean values for nasal bridge length (52.95 ± 5.42 mm), total nasal length (54.38 ± 4.67 mm) and morphologic width of the nose (35.24 ± 2.79 mm) in men were longer than nasal bridge length

(47.81 ± 4.60 mm), total nasal length (50.90 ± 4.20 mm) and morphologic width of the nose (31.59 ± 2.51 mm) in women ($p < 0.001$). Comparison of mean value for nasal tip protrusion (22.81 ± 3.02 mm) in men was longer than women (21.15 ± 2.56 mm) ($p < 0.05$) (Table 1).

The mean for soft tip width of the nose (21.99 ± 1.92 mm), anatomic nose width (25.33 ± 3.30 mm), total nostril floor width (17.63 ± 2.14 mm), right alar length (30.22 ± 2.82 mm) and left alar length (30.09 ± 2.92 mm) in men were shorter than women's soft tip width of the nose (24.03 ± 2.88 mm), anatomic nose width (28.83 ± 3.02 mm), total nostril floor width (20.63 ± 2.84 mm), right alar length (33.43 ± 2.89 mm) and left alar length (33.61 ± 2.98 mm) ($p < 0.001$). The means for right (3.59 ± 0.72 mm) and left (3.71 ± 0.65 mm) alar thickness in men were thinner than right (4.14 ± 0.85 mm) and left alar thickness (4.21 ± 0.89 mm) in women ($p < 0.001$) (Table 1).

There were no statistically significant differences between the sexes in regards to nasal root width, columella length and width ($p > 0.05$) (Table 1).

4. Discussion

Anthropometric measurements provide an important source of information for scientists. There are variations of nasal shape between men and women. Nose shape can give information about race ethnicity, age and sex (Amini et al., 2014; Uzun et al., 2006). Knowledge of measurements at an early age, how they change with development over time, and their maturation times are of great importance in the timing of early or final corrective surgical procedures (Doddi and Eccles, 2010; Tuncel et al., 2013). The development and shaping of the face is usually complete by 18 years old, therefore subjects were chosen that were between 18 and 30 years old (mean 21.22 years). After maturation, the changes in measurements are minimal. The morphometric differences in the nasal complex in different racial and ethnic populations have been the focus of investigations (Amini et al., 2014; Ercan et al., 2007; Uzun et al., 2006). Detailed information is not available in the literature on nasal dimensions for young Turkish men and women (Uzun et al., 2006). Our results were comparable with the studies which are available in literature (Farkas et al., 2005; Heidari et al., 2009).

Nasal measurements of various ethnic groups studied in the literature and our results were discussed and summarized in Tables 2a, b, and c. The mean result for total nasal length for Turkish men in our study (54.38 mm) was shorter than for Azerbaijani (55.90 mm), Japanese (56.90 mm), Iranian (58.50 mm), Greek (55.50 mm), Hungarian (55.00 mm), Italian (56.20 mm), and Portuguese men (59.50 mm) (Tables 2a and b) (Farkas et al., 2005).

The mean for total nasal length in young Turkish men was longer than for Russian (51.70 mm), Indian (43.70 mm), Singaporean Chinese (51.70 mm), Vietnamese (50.40 mm), Asian Thai (49.50 mm), Bulgarian (54.00 mm), Czech (54.00 mm), Croatian (53.80 mm), German (52.00 mm), Polish (53.70 mm), Slovak (49.40 mm), Slovenian (52.00 mm), Afro American (51.90 mm), North American (53.00 mm), Egyptian (47.40 mm), Angolan (49.80 mm), and Zulu (49.50 mm) men (Farkas et al., 2005).

The mean total nasal length of Turkish women in our study (50.90 mm) was shorter than that of Azerbaijani (52.30 mm), Chinese (53.80 mm), Vietnamese (52.10 mm), Thai (51.50 mm), Iranian (62.60 mm), Japanese (53.30 mm), Bulgarian (52.10 mm), Czech (52.10 mm), German (51.40 mm), Greek (52.80 mm), Hungarian (52.50 mm), Italian (52.10 mm), Polish (51.20 mm), Portuguese (57.80 mm), Slovak (53.50 mm), Slovenian (56.20 mm), and Egyptian women (54.60 mm) (reported by Farkas et al., 2005), and Baluch women (53.00 mm) (Heidari et al., 2009).

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