

Original Research Article

Sexual dimorphism of nasal index, nasal breadth and nasal height among young Kashmiri population

Shameema Gulzar¹, Ashaq Hussain^{3*}, Irshad Ahmad Kumar⁴,
Mohd Saleem Itoo², Nasir Sayeed Mir²

¹Demonstrator, ²Department Anatomy, Government Medical College Baramulla, Jammu and Kashmir, India

³Medical Officer, Health Services Kashmir, Jammu and Kashmir, India

⁴Department of Surgery, Government Medical College, Srinagar, Jammu and Kashmir, India

Received: 10 July 2022

Revised: 01 August 2022

Accepted: 06 August 2022

*Correspondence:

Dr. Ashaq Hussain,

E-mail: drashaque.bhat@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Nose contributes as a very important and prominent part of the face; and occupies the most visible position on normafrontalis. There is an anthropometric harmony between different structures of face including nose, lips, eyes, forehead, chin and cheek. Our study was aimed to determine sexual and ethnic differences in external nose measurements of young adult Kashmiri population and to provide baseline data for reconstructive cosmetic surgeons and forensic experts.

Methods: This study was conducted among 300 healthy participants (150 males and 150 females) belonging to Kashmiri population. Nasal height, length and breadth were measured using a vernier caliper. Then, the nasal index was determined for each subject. The obtained data was subjected to statistical analysis.

Results: In case of males, mean nasal index was 83.31 ± 12.31 mm, mean nasal length was 57.28 ± 4.51 mm, mean nasal breadth was 48.41 mm and mean nasal height was 36.17 ± 20.9 mm, while in case of females mean nasal index was 226.83 ± 46.41 mm, mean nasal length was 50.16 ± 3.54 mm, mean nasal height was 13.97 ± 2.01 mm and mean nasal breadth was 31.02 mm.

Conclusions: Nasal type among the Kashmiri male population is predominantly mesorrhine while in females it is hyperplatyrrhine or very wide nose.

Keywords: Kashmiri, Nasal index, Vernier Calliper

INTRODUCTION

Nose is an important part of facial aesthetics. It is pyramidal shaped structure in the midline of normafrontalis. Nasal anthropometric values are usually gender specific. Existence of gender difference in morphometric measurements of nose are due to genetic make-up and inheritance, manifesting as sexual dimorphism.¹ Generally surgeons plan the surgical procedures of external nose reconstruction based on their surgical case experiences, which includes both subjective as well as objective factors. The subjective factors

include nasal aesthetics which depends on ethnic background and as well their geographical and cultural differences.^{2,3} Apart from reconstructive surgeries, nasal anthropometry is very useful in forensic medicine.

On the basis of nasal index, the nose can be categorized into three types: leptorrhine (long and narrow nose), mesorrhine (medium), and platyrrhine (broad nose) as detailed in Table 1.⁴

The present study was conducted to evaluate gender differences in external nasal parameters, thus providing a

baseline data for kashmiri population which will be an important tool for forensic investigations and reconstructive surgeries.

Table 1: Type of noses.⁴

Categories size of nose	Nasal index	
	On living head	On skull
Hyperleptorrhine Long narrow nose	40-54.9	
Leptorrhine Moderately narrow nose	<70	<47
Mesorrhine Moderately or medium size	70-84.9	47-50.9
Platyrrhine Moderately wide nose	85-99.9	51-57.9
Hyperplatyrrhine Very wide nose	100 or more	58 or more

METHODS

The present study was a cross-sectional comparative study, conducted among 300 students aged between 20-25 years of medical and paramedical departments of Government Medical College, Baramulla, Kashmir. This study was done over a period of six months from January 2022 to June 2022. Ethical clearance was taken from the institutional ethical committee. Subjects were selected on the basis of random sampling. Students with any facial deformity, injury or any past reconstructive surgery on face were excluded.

The students were made to sit in an upright position in a relaxed mood and anatomical position in order to maintain Frankfurt horizontal line (infra-orbital margin to external acoustic meatus). All the measurements were taken by two observers, one male and one female observer to maintain the full privacy. The following important landmarks were recorded. Nasion- midpoint between the nasal root and nasofrontal suture. Subnasale-

midpoint of columella base. Pronasale- most prominent point of nasal tip. Alar curvature- most lateral points in curved baseline of each ala.

Three dimensions were taken for each individual; nasal height- measured from point of nasion to subnasale using movable divider arms of digital caliper. Nasal breadth- measured at right angle to nasal height from one alar curvature to another. Nasal length- from the point of nasion to pronasale.

RESULTS

In case of males, mean nasal index was 83.31±12.31 mm, mean nasal length was 57.28±4.51 mm, mean nasal breadth was 48.41 mm and mean nasal height was 36.17±20.9 mm, while in case of females mean nasal index was 226.83±46.41 mm, mean nasal length was 50.16±3.54 mm, mean nasal height was 13.97±2.01 mm and mean nasal breadth was 31.02 mm.

In our study we found that mean nasal height was less in females as compared to males while the breadth was comparatively on higher side. Observations made are given below in Table 2.

Table 2: Results.

Gender	Mean length	Mean breadth	Mean height	Mean index
Both sex	78.8	55.23	25.07	155.07
Female	50.16	31.02	13.97	226.83
Male	57.28	48.41	36.17	83.31

Nasal length-from the point of nasion to pronasale.

Among males, 50.6% had mesorrhine type, 30% had platyrrhine and about 12% of male students had hyperplatyrrhine type of nose. About 7.3% had leptorrhine with <1% of students had hyperleptorrhine type of nose. The predominant type of nose among the Kashmiri female population was hyperplatyrrhine.

Table 3: Distribution of percentages of nose type of study subjects.

Sex	Hyperleptorrhine		Leptorrhine		Mesorrhine		Platyrrhine		Hyperplatyrrhine	
	N	%	N	%	N	%	N	%	N	%
Both	1	00.3	11	3.6	76	25.2	45	14.95	169	56.14
Male	1	<1	11	7.3	76	50.6	45	30	18	12
Female	0	0	0	0	0	0	0	0	151	100

DISCUSSION

The importance of nasal index in anthropological studies has been recognised for a long time. Being based on both bony and cartilaginous landmarks, this index differs from most other anthropological indices.⁵ Springer et al proved that there do exist gender differences in nasal morphometry and nasal index of both males and females.⁶ No universal parameter can define ideal aesthetics of nose across cultures and ethnic backgrounds.⁷ Surgical

procedures of external nose reconstruction based on their surgical case experiences which includes nasal aesthetics varies depending on the ethnic background as well their geographical and cultural differences.^{8,9} Each race such as Caucasian, Africans or Asians have got special nasal features with width of the nose found very significant when the male and female groups are compared.⁴

In an Indian morphometric study, the mean width of the nose was 3.5 cm in total, 3.74 cm in males and 3.43 cm in

females respectively while in our present study mean width was 28.37 mm for males and 31.01 mm for females thus showing higher values in case of females.¹ In a morphometry study, narrow noses were more commonly found in 46 (78%) females than in 39 (70%) males while in our present study narrow type of nose in males was seen in less than 8% and in females no one had narrow nose.¹⁰

Ray et al also reported that females have significantly lower nasal index than males ($p < 0.05$) which is inconsistent to our findings.¹¹ Sforza et al studied that nostril breadth in males was higher (2.2 cm) than females (1.9 cm) while in our study it was higher in females (3.1 cm) than males (2.8 cm).¹²

Ogah et al reported that mean nasal length, width and height were higher in males than in females however in our study we found that mean nasal height and nasal length is higher in males while as width was higher in females.¹⁰ Jabeen et al in their study showed that main nasal type among population of Jammu and Kashmir was leptorrhine and the mean nasal index was more in males than females which is inconsistent to our findings.¹³ Our study found that main nasal type among Kashmiri men was mesorrhine (>50%) and platyrrhine (30%) while as in Kashmiri females hyperplatyrrhine was predominant nose type. Besides, in our study we found females have higher nasal index than males, they have wide nose and have less nasal height than males as also proved by some authors in their studies in some other regions like Aung et al, Eboh et al, Koirala et al and Oladipo et al.^{3,14-16}

CONCLUSION

Nose is the most prominent feature of the face, and it shows significant variation among different races. This difference is used as a reliable parameter for determining the racial background of an individual. Main nasal type among Kashmiri men is mesorrhine (>50%) and Platyrrhine (30%) while as in Kashmiri females hyperplatyrrhine is predominant nose type.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Kumar BS. Morphometric study of external nose for sex determination and ethnic group differentiation. *Indian J Forens Med Toxicol.* 2020;14(3).
- Leong SC, Eccles R. Race and ethnicity in nasal plastic surgery: a need for science. *Fac Plast Surg.* 2010;26(02):063-8.
- Aung SC, Foo CL, Lee ST. Three dimensional laser scan assessment of the oriental nose with a new classification of oriental nasal types. *Br J Plast Surg.* 2000;53:109-16
- Deulkar S, Shende V, Gathe S. Assessment of nose width in western Maharashtra population: a cross-sectional study. *Int J Res Health Sci.* 2015;3(4):471-3.
- Bhargava I, Sharma JC. The nose in relation to head and face. *An Anthropometric Study.* *Indian J Otolaryngol.* 1959;11(4):213-8.
- Springer IN, Zernial O, Warnke PH, Wiltfang J, Russo PA, Wolfart S. Nasal shape and gender of the observer: implications for rhinoplasty. *J Cranio-Maxillofac Surg.* 2009 J;37(1):3-7.
- Broer PN, Buonocore S, Morillas A, Liu J, Tanna N, Walker M, et al. Nasal aesthetics: a cross-cultural analysis. *Plast Reconstruct Surg.* 2012;130(6):843e-50e.
- Fedok FG, Burnett MC, Billingsley EM. Small nasal defects. *Otolaryngol Clin North. Am.* 2001;34(4):671-94.
- Uzun A, Akbas H, Bilgic S, Emirzeoglu M, Bostancı O, Sahin B, et al. The average values of the nasal anthropometric measurements in 108 young Turkish males. *Auris Nasus Larynx.* 2006;33(1):31-5.
- Ogah SA, Ologe FE, Dunmade AD, Lawal IA. Nasal Index as seen at the University of Ilorin Teaching Hospital (UTH), Ilorin, Nigeria. *Asian J Multidiscip Stud.* 2014;2(7):9-13.
- Ray SK, Saha K, Kumar A, Banjare S. Anthropometric study of nasal index among the population of Western Uttar Pradesh region. *Int J Scient Stud.* 2016;4(2):65-70.
- Sforza C, Grandi G, Binelli M, Tommasi DG, Rosati R, Ferrario VF. Age-and sex-related changes in the normal human ear. *Forens Sci Int.* 2009;187(1-3):110-e9.
- Jabeen N, Magotra R, Choudhary S, Sharma AK. Study of nasal index in different zones of Jammu and Kashmir. *JK Sci.* 2019;21(2):72-5.
- Eboh DE, John EA. Morphological assessment of face and nose shapes among the Ukwuanis of Delta state, Nigeria. *J Exp Clin Anat.* 2011;10:4-8.
- Sarun K, Sandip S, Laxman K. Nasal index of the Tharu and Mongoloid population of Nepal: a cross sectional study. *Russian Open Med J.* 2014;3(3):302.
- Oladipo GS, Olabiyi AO, Oremosu AA, Noronha CC. Nasal indices among major ethnic groups in southern Nigeria. *Sci Res Essays.* 2007;2(1):20-2.

Cite this article as: Gulzar S, Hussain A, Kumar IA, Itoo MS, Mir NS. Sexual dimorphism of nasal index, nasal breadth and nasal height among young Kashmiri population. *Int J Res Med Sci* 2022;10:1963-5.