

Study of Nasal Index in Different Zones of Jammu and Kashmir

Nusrat Jabeen, Rachna Magotra, Shahnaz Choudhary, Ashwani K Sharma

Abstract

The anthropometry of nose is an important index to identify a pure race from mixed races. Nasal index is a very sensitive index in nasal anthropometry, as it varies with sex, race and habitat of the person. The anthropometry of face in general and nose in particular has been used in forensic investigations, reconstructive surgeries and genetic counselling. To study the nasal index in different zones of Jammu and Kashmir. 120 students of first professional MBBS Government Medical College Jammu were used as subjects. All of them were in the age group of 18 to 22 years. The length and breadth of the nose was measured by means of digital calliper and the nasal index was calculated using the formula NASAL. The results so obtained were tabulated and analysed. Sexual dimorphism was seen in all the recorded parameters. Anthropometric variation for nasal index is seen in different zones of Jammu and Kashmir. Mean nasal index was 65.98+9.36 for males and 72.15+11.30 for females. Most common type of nasal form in both males and females is leptorrhine or moderately narrow nose. Nasal index plays a significant role in determining sex and race and so is helpful to forensic investigators. It is also useful for plastic surgeons while performing rhinoplasty of a particular region as it shows ethnic specificity.

Key Words

Nasal index, Nasal height, Nasal breadth, Nasal Anthropometry, Digital Calliper

Introduction

Anthropometry is defined as a series of systematized techniques which express the dimensions of human skeleton quantitatively (1). One of the sensitive anthropometric index is nasal index which is useful to predict the race and gender of an unknown individual. In fact the dimensions of nose provide best clue to the individual's racial origin. As a consequence of natural selection in human evolution, the people living in cold and dry climate have narrow noses, as compared to those living in warm and moist climate, where they are broader (2). So, nasal index varies with climatic conditions. Nasal index divides the nose into different types as classified by Martin and Sallar (3) (Table-1)

While reviewing the available literature we did not find any study which provided a baseline value of nasal index

Table 1. Showing categories of nose

Categories	Size of Nose	Nasal Index
Hyperleptorrhine	Long Narrow nose	40 to 54.9
Leptorrhine	Moderately Narrow Nose	<70
Mesorrhine	Moderate or Medium Size	70-84.9
Platyrrhine	Moderately Wide Nose	85 to 99.9
Hyperhinerplaty	Very Wide Nose	100

in different zones of Jammu and Kashmir. The present study was carried out to determine the nasal index in various zones of jammu and Kashmir. This would be a vital tool for forensic experts and reconstructive surgeons and would provide a baseline data of nasal index for further studies in the region (4).

From the Deptt. of Anatomy Govt Medial College (J&K), India

Correspondence to : Dr Rachna Magotra, Associate Professor, Department of Anatomy, Govt. Medical College, Jammu

Material and Methods

The present study was conducted on 120 medical students of first professional MBBS Government Medical College Jammu after verbal informed consent. Ethical clearance for the study was taken from the institutional ethical committee. The students with facial deformity, facial injury or scar were excluded from the study. This particular group of subjects was chosen as they were easily available healthy adults who belonged to various zones of the state. They were asked to sit upright, in a relaxed mood with head in anatomical position to maintain Frankfurt horizontal line (from infraorbital margin to external acoustic meatus). Measurements were taken according to the guidelines by Farkas et al [5]. The students were asked not to smile or change their expression while the measurements were being taken. Measurements were done by a single observer to prevent inter-observer error. Four landmarks were taken:-

- 1) NASION-The point in midline of both the nasal root and the nasofrontal suture.
- 2) SUBNASALE-Midpoint of the columella base.
- 3) PRONASALE-Most prominent point of nasal tip.
- 4) ALAR CURVATURE-Most lateral point in curved baseline of each ala

Two dimensions of the nose were taken

NASAL HEIGHT -The height of the nose is measured by keeping the upper fixed divider arm of digital calliper on the Nasion and lower movable divider arm on Subnasale. The readings were recorded on the digital screen.

NASAL BREADTH -The breadth of the nose is measured at right angles to nasal height from one alar curvature to another.

We followed internationally accepted standards in anthropometry and the values were taken to the nearest

of 0.01 cm. The nasal index was calculated by the formula

$$\text{Nasal breadth/nasal height} \times 100$$

The data so obtained was fed into the computer, tabulated and analyzed statistically.

Result

In our study we included 120 students in age group of 17 to 22 years. Amongst them 67 were males and 53 were females. Following were the observations :-

Mean nasal length- 52.5mm with S.D of 4.52, Mean nasal width-35.44mm with S.D, of 4.39, Mean nasal index- 68.23 with S.D. of 10.45, Mean nasal index in Females was 65.98 with S.D. of 9.36, Mean nasal index in Males was 72.25 with S.D. of 11.30. 95% confidence interval was 1.75

The Nasal Indices were calculated separately for males and females and results presented in tabulated form:-

Table 2. Showing distribution of NASAL INDEX among males and females

SEX	Mean N.Length	Mean N.Breadth	Mean N.Index	S.D.
BOTH	52.25	35.44	68.23	10.45
FEMALE	64.52	41.75	65.98	9.36
MALE	42.62	37.96	72.15	11.30

The predominant type of nose in both males and females was leptorrhine or moderately narrow nose (57.5%). Its percentage in males and females separately was 49.05% and 64.17% respectively. Mesorrhine or medium sized nose was the second common type (30.83%). It was seen in 35.84% in males and 26.86% in females. Hyperleptorrhine or long narrow nose was present in 6.66% of students which was 3.77% in males and 8.95% in females. Moderately wide nose or Platyrrhine was seen in 11.32% and was only present in males. The distribution of the type of nose is seen as:-

Table 3 Showing Distribution of Study Subjects on Type of Nose

SEX	Hyperleptorrhine	%age	leptorrhine	%age	Mesorrhine	%age	Platyrrhine	%age
BOTH	8	6.66%	69	57.5%	37	30.83%	6	5%
MALE	2	3.77%	26	49.05%	19	35.84%	6	11.32%
FEMALE	6	8.95%	43	64.17%	18	26.86%	0	0%

Discussion

Since ages, our nose, which is the most prominent part of our face, has been a symbol of beauty and honour. Nowadays people have become more conscious about their face value, so a large number of surgeries are being performed to increase its aesthetic value. Nasal index is a very important ethnic sensitive feature, so, its

knowledge is important for the surgeons who try to maintain the core ethnic features while performing any surgery on nose(5-8).

The nasal index observed by different authors by conducting study on different populations was compared and their nose type estimated (*Table-4*)

It was observed that Nigerian population (9-18) had

Table-4 Comparison of nasal index of different populations/Studies.

Population	Authors	Male		Female	
		Mean \pm S.D.	Nose type	Mean \pm S.D.	Nose type
Onges(Andman islands)	Pandey (2006)(7)	87.43 \pm 6.63	Platy	90.07 \pm 7.10	Platy
Ahirwars (M.P.)	Singh and Purkait(2006)(8)	81	Meso	82.4	Meso
Dangis(M.P.)	Singh and Purkait(2006)(8)	76.5	Meso	76.5	Meso
Andoni(Nigeria)	Oladipo et al(2009)(3)	79.83 \pm 4.19	Meso	83.77 \pm 1.09	Meso
Okrika(Nigeria)	Oladipo et al(2009)(3)	86.23 \pm 1.72	Platy	86.46 \pm 2.37	Platy
Hausa(Nigeria)	Anas(2010)(9)	70.7 \pm 11.3	Meso	67.2 \pm 8.3	Meso
Yoruba(Nigeria)	Anas(2010)(9)	100.9 \pm 8.9	Platy	94.1 \pm 8	Platy
Bini adolescents(Nigeria)	Eboh (2011)(10)	99.13 \pm 9.26	Platy	99.27 \pm 11.67	Platy
Ilorin(Nigerian Africans)	Jimoh et al (2011)(11)	90.7	Platy	88.2	Platy
Ukwuani(Nigeria)	Eboh,John (2011)(12)	97.47 \pm 12.88	Platy	98.07 \pm 8.37	Platy
Bheel Meena(Rajasthan)	Gangrade(2012)(13)	83	Meso	79.73	Meso
Kosovo Albanian	Staka(2012)(14)	67.07 \pm 6.67	Lepto	63.87 \pm 5.56	Lepto
Brahmins	Kaushal(2013)(6)	70.02 \pm 9.13	Meso	69.89 \pm 6.04	Lepto
Majhjabi sikhs	Kaushal(2013)(6)	76.51 \pm 8.98	Meso	68.95 \pm 6.22	Lepto
Muslims	Kaushal(2013)(6)	67.04 \pm 8.87	Lepto	69.38 \pm 8.09	Lepto
Hindus(Gwalior region)	S. K. Sharma et al (2014)(15)	80.59 \pm 9.122	Meso	77.29 \pm 8.472	Meso
North Indian	Agarwal(2016)(16)	67.79 \pm 9.03	Lepto	60.44 \pm 11.09	Lepto
Brokpa Aryan(Kargil j&k)	Mohammad Ali(2017)(17)	70.67 \pm 8.30	Meso	69.24 \pm 8.50	Lepto
Med students in college of Bangalore	Asharani S K (2015) (18)	75.80 \pm 3.23	Meso	73.60 \pm 3.21	Meso
J & K Population	Present study	72.15 \pm 11.30	Meso	65.98 \pm 9.36	Lepto

platyrrhine or short and broad noses predominantly while Caucasians and Albanians (14,15,16) have leptorrhine noses. These variations in nasal index may be because of different size of sample, different measurement techniques used, and also due to genetic, hormonal, nutritional and climatic factors

In the present study the nasal index of students belonging to different zones of Jammu and Kashmir was studied and it was observed that nasal type on the basis of mean nasal index was mesorrhine in males and leptorrhine in females. These findings are consistent with the findings of Mohd Ali & Sehrawat (17) who found leptorrhine shape in males and mesorrhine in females based on mean nasal index of Brokpa-Aryans of Kargil (J &K). In our study the number of students having moderately narrow nose or Leptorrhine variety was 49.05% in males and 64.17% in females. So leptorrhine was the dominant form of nose in both males and females. On the other hand Mohd Ali and J. S. Sehrawat (17) observed that dominant nasal type was leptorrhine in males (50%) and hyperleptorrhine (52.14%) in females. Another study conducted by Agarwal *et al* (16) also observed that leptorrhine shape was most common form of nose in north Indian population.

In our study leptorrhine is the commonest type of nose followed by mesorrhine and platyrrhine. This is not in concordance with Asharani *et al* (18) who studied the nasal index of medical students in a Karnataka Medical college and found that majority of students had mesorrhine type of nasal form followed by platyrrhine and leptorrhine forms.

Authors like S.K.Sharma *et al* (15) found that mean nasal index was more in males as compared to females. This matches our findings as mean nasal index is 65.98+9.36 in females and 72.15+11.30 in males.(Table-3). Similar findings are observed by workers like Kaushal *et al* 2013 (6) and Gangrade 2012 (13). Some workers like Pandey *et al* (7), Singh and Purkait (8) and Oladipo 2009 *etal* (3) found mean nasal index less in males as compared to females. Therefore nasal indices show sexual dimorphism.

The main aim of our study was to find the nasal index of different zones of Jammu and Kashmir and to compare it with similar national and international studies.

Conclusion

We conclude that In Jammu and Kashmir the main nasal type is leptorrhine or moderately thin nose. The mean nasal index is more in males than females so sexual dimorphism is present. This would serve as credible reference for preoperative and postoperative evaluations of nasal surgery and would also be helpful in evolutionary studies. It is also helpful in medicolegal and anthropological studies.

References

- 1) R.Dayananda, Umesh Babu, J Kiran. Estimation of stature from dimensions of foot. *Medico-Legal Update*. 2014;14(1):6
- 2) Oladipo G S, Eroje M A, Fahwehinmi H B. Anthropometric comparison of nasal indices between Andoni and Okrika tribes of Rivers State Nigeria. *IntJ Med Med Sci* 2009;1(4):135-37.
- 3) Martin, R., and K. Saller (1957). *Lehrbuch der anthropologie*. Gustav Fischer Verlag, Stuttgart Hajnis K. Farkas L G, Ngim RCK, Lee ST Venkatadri G. Racial and Ethnic morphometric differences in craneiofacial complex, In Farkas L.G., Editor *Anthropometry of Head and Face* Newyork:1994, pp.201.
- 4) Oladipo G S, Olabiyi A O, Oremosu A A, Noronha C C. Nasal indices among major ethnic groups in Southern Nigeria *Scientific Res Ess* 2007;2(1):20-22.
- 5) Farkas L G, Phillips J H, Katie M. Anthropometric anatomical and morphological nose widths in Canadian Caucasian adults. *Can J Plast Surg Autumn* 1998;6(3):149-151.
- 6) Kaushal S, Patnaik V V G, Kaur P. Somatometric Analysis of Nasal Morphology in the Endogamous Groups of Punjab *Hum. Bio. Rev* 2013;2(1):1-11.
- 7) Pandey A K. Cephalofacial variations among Onges, *Anthropologist* 2006; 8(4):245-49.
- 8) Singh P, Pukrait R. A Cephalometric study among sub caste groups of Dangri and Ahirwar of Khurai block of Madhya Pradesh. *Anthropologist* 2006;8(3):215-17.
- 9) Anas I Y, Saleh M S. Anthropometric comparison of nasal indices between Hausa and Yoruba ethnic groups in Nigeria. *J of Sci Res and Reports* 2010;3(3):437-44.