



Journal Homepage: - www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI: 10.21474/IJAR01/4018
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/4018>



RESEARCH ARTICLE

THE NASAL INDEX OF SOUTH INDIAN SKULLS.

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Manuscript Info

Manuscript History

Received: 22 February 2017
 Final Accepted: 18 March 2017
 Published: April 2017

Key words:-

Nasal index, nasal parameter, South Indian nose, Nasal height, Nasal width

Abstract

Aim and Objective: The aim of this research is to determine and compare the nasal parameter in dry South Indian human skull. The objective is to determine the normal parameters of anterior nasal apertures by measuring the width and height and calculating the nasal index. **Materials and Methods:** The study was carried out using sample size of fifty (50) skulls. They were selected from the Department of Anatomy of Saveetha Dental College in Chennai. In order to obtain the nasal indices, the nasal width and nasal height in each skull was measured. The nasal widths and the nasal height were measured using a sliding calliper. The nasal indices were calculated as: Nasal width/Nasal height x 100. **Results:** The mean nasal width, height and index are 2.49cm, 3.26cm and 77.3cm respectively. The results of this study have shown that the mean nasal index of the South Indian falls within the nose type called mesorrhine or medium nose (70.0-84.9). **Conclusion:** The South Indian population has the mesorrhine nose type. This information will be of significance in forensic science, anthropological studies and clinical practice.

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Introduction:-

The nose is a part of the respiratory tract and it is located superior to the hard palate [1]. The anterior nasal aperture is pear-shaped, being wide below and narrow above. The nose is considered as one of the clues that provides information to the racial origin [2]. Environmental climatic conditions and race are variables that determine the shape of the nose [3]. For example, in the cold climate, smaller, narrower nose is favoured and dry atmosphere favours a more extensive nose in hotter atmosphere [4]. This is to say that nasal prolongation is impacted by adjustment to environment [5].

Nasal index prove as a useful tool for neurosurgeon, plastic surgeon and anthropologists. Facial anthropometry is an important tool utilized as a part of genetic counselling, reconstructive surgery and forensic examination [6]. Before changing the state of the nose, analysis of the nasal index is the initial step a specialist takes before performing rhinoplasty.

The nasal cavity is usually classified into three major groups of nasal parameters [7][8]. These groups are:

- Mesorrhine or medium nose (70.0-84.9)
- Leptorrhine or the fine nose (69.9 or less)
- Platyrrhine or broad nose (>85.0)

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All races have their quirks and these differ considerably when alluding to different anthropometric parameters [9]. Nasal index is very useful in anthropology in differentiating racial and ethnic differences [12][13][14]. Nasal index has got a variation in gender, age and race. There is a need to analyse and find out the nasal index for South Indian population.

Materials and Method:-

Fifty South Indian dry skulls of unknown sex were randomly selected from Department of Anatomy of Saveetha Dental College, Chennai. Skulls with congenital abnormalities and damaged anterior nasal aperture were excluded. A sliding vernier calliper (12.5cm with accuracy of 0.01cm) was used to measure the nasal height and nasal width, which is shown in Figure 1. The nasal width was measured first. The distance of the widest extension was taken as the nasal width. Next, the nasal height was measured from the lower border of nasal bone to the anterior nasal spine, perpendicular to that of the nasal width [11]. The measurements were tabulated and results were calculated.

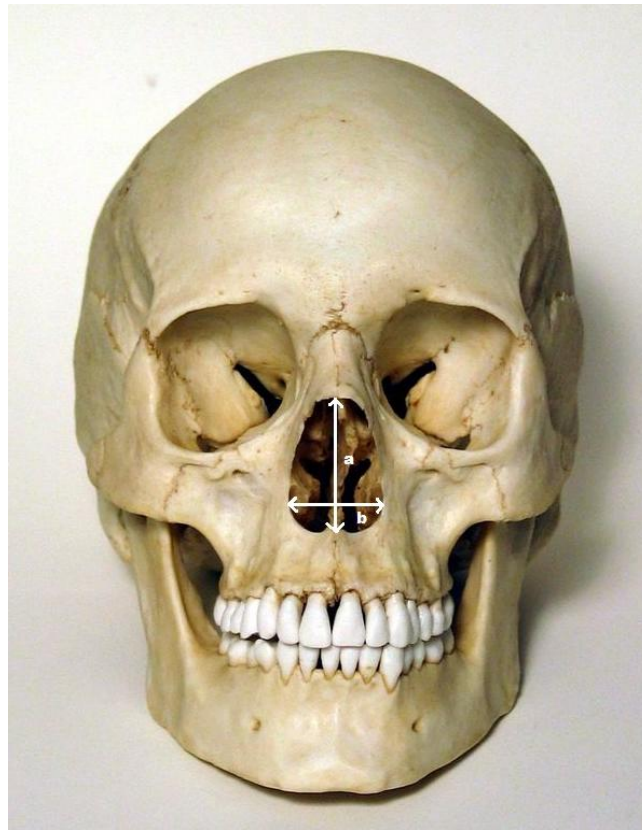


Figure 1: Nasal width and nasal height of skull- (a) Nasal height (b) Nasal width.

The nasal index can be calculated with the ratio of nasal width to the nasal height of the nasal multiplied by 100. The mathematical expression of the nasal index is:

$$\text{Nasal Index} = \frac{\text{Nasal Width}}{\text{Nasal Height}} \times 100$$

Result:-

The result of the study were presented in tabular form. The dimensions of the nasal parameter that has been acquired in the study, together with the statically analysed values of skulls are shown in Table 1. The height of the dry skulls range from 2.0cm to 3.6cm, the width is from 2.5cm to 4.0cm and the nasal index of the dry skulls range from 57.1 to 116.1cm. The mean nasal height, nasal width and nasal index are 3.26cm, 2.49cm and 77.3cm respectively.

Table 1:- Mean and range of minimum and maximum nasal width, length and nasal index

	Range		Mean
	Minimum (cm)	Maximum (cm)	
Nasal Height	2.0	3.6	3.26
Nasal Width	2.5	4.0	2.49
Nasal Index	57.1	116.1	77.3

Discussion:-

A study was carried out in 1980 that showed most Western European possess leptorrhine type of nose, which is long and narrow with nasal index of 69.9 or less. Australians as well as the Bantus and Bushmen of African were platyrrhine, having broad nose with a nasal index of 85.0 and above 26. Similar to that of the general Western Europeans, a past study has shown that the nasal index of Germans are an average of 71.0 and below, which is leptorrhines [10].

Table 2 shows the comparison of nasal indices that has been acquired in the study with previously studied nasal indices of other populations. Table 2 clearly shows that ethnicity significantly affects nasal parameters as differences exist amongst different races/ tribes and ethnic groups as shown in the table.

Table 2:- Comparative table of nasal indices among various populations

Race/Population	Nasal Index	Author(s)/Year
Sudroid	89.80	Franciscus&Long 1991 [18]
Aryans	83.00	Franciscus&Long 1991 [18]
Western Europeans	69.90	Heirnaux&Hartono 1980 [19]
Bantus	85.00	Heirnaux&Hartono 1980 [19]
German	71.00	Nichang, 2004 [20]
Male onges	72.3-97.7	Franciscus&Long 1991 [18]
Female onges	70.5-97.4	Franciscus&Long 1991 [18]
Igbo male	95.80	Oladipo <i>et al.</i> , 2006 [22]
Igbo female	90.80	Oladipo <i>et al.</i> , 2006 [22]
Yoruba male	90.00	Oladipo <i>et al.</i> , 2006 [22]
Yoruba female	88.10	Oladipo <i>et al.</i> , 2006 [22]
Ogoni male	106.10	Oladipo <i>et al.</i> , 2007(a) [21]
Ogoni female	90.90	Oladipo <i>et al.</i> , 2007(a) [21]
Ijaws	96.37	Oladipo <i>et al.</i> , 2007(b) [23]
Yorubas	89.20	Oladipo <i>et al.</i> , 2007(b) [23]
Igbos	94.10	Oladipo <i>et al.</i> , 2007(b) [23]
Yoruba male	90.02	Oladipo, Fawehinmi <i>et al.</i> 2009 [24]
Yoruba female	83.58	Oladipo, Fawehinmi <i>et al.</i> 2009 [24]
South Indian	77.30	Present study

Australoids are platyrrhine with broad nose and have nasal index of 85, most Caucasians are leptorrhine with long and narrow nose and have nasal index of 69.9 or mesorrhine with index between 70.0 and 84.9 [15]. The Indo-Aryan is similar to the Europeans, possessing a fine nose [15] In Jingpo people in China are mesorrhine [16]. Indo-African [15] and AfroAmerican have platyrrhine nose type [17].

This study has shown that the South Indians have a mesorrhine nose type, similar to the Aryans, Germans, Onges and Yoruba females, with nasal index of 77.3.

Conclusion:-

The mean nasal index of South Indian population has been determined. The South Indian fall within the mesorrhine or medium nose type. The result of this study will be useful in forensic medicine and anthropology and will also serve as a future framework for estimating the other craniofacial variables in same population.

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