# Identification of Sex from Facial Index in Western Maharashtra Population

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## Abstract

**Background**: Facial Index anthropometry has well known, implications in health-related fields, identification of person in Forensic Medicine, Plastic Surgery, Orthodontics, Archaeology, hair style design and examination of differences between races and ethnicities.

**Method:**120 (60 Male and 60 female) adults aged between 25 to 45 were studied. Facial height is divided by Breadth of Zygomatic arch and multiplied by 100. The Measurement were taken from Nasion to Gnathion and distance between two zygoma by asking the volunteers to sit in upright position, spreading calliper used for measurement of two zygoma and sliding calliper for Nasion to Gnathion.

**Results**: The man value of Male Facial Index was 92.1 (SD±0.40) female was 89.2 (SD±0.19),t test value was 1.97 and p value was highly significant (P<0.01) and anthropologically obtained values belong to Leptoproscopic Index.

**Conclusion:** The present study of western Maharashtra will be useful for medico legal expert, anthropologist to differentiate from other parts of country and abroad as well. Moreover, it would be useful to orthodontics plastic surgeons for reconstruction of face.

***Key words:*** *Spreading calliper, Sliding calliper, Ethnic, Medico-legal, Volunteers.*

## Introduction

The pioneer to measure the Facial Index was William.R. Leonard Professor of Anthropology from North-western university in 1987 from Evanston to study the ethnicity and race. The face is the body part that, epitomises a human person.(1) The face is required for identification of individuals in the passport, driving license and other documents yet human face is an anatomical entity that arouse through biological processes during the course of human evolution and its structure is regulated by same embryological, anatomical and physiological mechanism that form all other parts of the body thus the facial parameters have scientific identity. (2)Slight Modifications in the structural elements of the face (bones, muscle, cartilage) allow individual features or facial morphology to be interposed over the general, modern human face pattern. These variations in the facial morphology arise through differential growth and create an individual face that allow us to distinguish one person to another. (3) These variations are controlled by multiple factors like hormonal, genetic, environmental and nutritional factors. Hence attempt was made to study the facial index in western Maharashtra people.

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## Material and Method

60 adult Males and 60 adult females regularly visiting Vedantaa hospital of Medical sciences were studied.

**Inclusive Criteria:**60 Males, 60 Females normal Facial Index well-nourished volunteers aged between 25 to 40 years volunteers were selected for study.

**Exclusive Criteria:** Patients had history of mandibular fracture or fracture Normafacials, malnourished or any bone diseases was excluded from the study.

**Method** The volunteers were asked to sit in upright position. The facial Index was measured with the help of spreading calliper and sliding calliper.

**Facial Height** – is measured straight distance between Nasion to Gnathion (Measured by sliding calliper)

**Breadth of zygomatic Arch** – It was measured straight distance between twozygoma (Measured by spreading calliper).

Facial Index =Facial height X 100

Breadth of zygomatic arch

Measurements were taken as

**1) Nasion** – Thepoint at Nasal root intersected by Midsagital plane (Nasal root is a depression of Nose)but at the Naso-frontal suture which can be felt by slightly probing the root of the Nose.

**2) Gnathion** – is the lowest point jaw intersected by the Mid Sagital plane. This point can be palpated on the lower jaw slightly another to chin.

**3) Zygoma** – is the most laterally placed point on zygomatic Arch.

Duration of study was about 2 years.

Statisticalanalysis – The obtained values of males and females were compared by 't' test by using SPSS 2007 software.

## Observation and Results

Table – 1: Mean values Male Facial Index was 92.78 (SD±0.40) and female Index 89.1 (SD±0.19) t test was and P value was P<0.0.

Table – 2: present Facial Index was compared with anthropological Index.

Table-3: The present study was compared previous workers.

## Discussion

In the present study of Facial Index in western Maharashtra population. The mean value of Male facial Index was 92.1 (SD±0.40) and female was 89.2 (SD±0.19) t test value was 64.5 and p<0.000 (p value was highly significant) (Table-1). As per the anthropological Index both obtained values fall under Leptoproscopic anthropological Index. (Table-2). The present values were more or less in agreement with previous studies. (5)(6)(7)

The obtained anthropological values were due to nutritional, genetic and environmental factors.[8] Harmony and disharmony of the face depends on the relationship between individual measurements of craniofacial Index. It was also observed that, variations of facial Index in new born and adults. Moreover,in it was concluded that, facial anthropometry can change with age due to re-absorption of cranial bones including mandible.[9]

In addition,this bone being mesoderm origin is more plastic tissue after blood hence it adapts with environmental and nutritional changes.[10]Moreover dates of fusion are usually delayed in normal individuals of short stature and accelerated in tall individuals. The factors which determine. The time of ossification is obscure. Different times of ossification of bones of skull ossify earlier. Functional and morphological factors may be involved in such cases.[11]It is established fact genes became active if they get proper nutrition otherwise, they are called as silenced genes, which retard the bio-mechanical functions of the body.

## Summary and Conclusion

The present study of Facial Index in western Maharashtra population in both sexes will be useful to medico – legal expert, anthropologist, Oral Maxillo-facial surgery, plastic surgery, but this demands further genetic, hormonal, nutritional, anthropological study because exact morpho-metric values of Mesodermalderivatives are still un-certain.

This research paper was approved by ethical committee of Vedantaa Institute of Medical Sciences Dhundalwadi DahanuPalghar (Dist) – 401610 (Maharashtra)

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**Table-1: Comparative study of both Male and Female Facial Index**

| **Male Facial Index** | **Female Facial Index** | **t test value** | **P value** |
|---|---|---|---|
| Mean value 92.1 (SD±0.40) | Mean value 89.1 (SD±0.19) | 64.5 | P<0.00 |

P value was highly significant (SD±0.40)

**Table-2: Anthropological Index**

| **No** | **Facial types** | **Male Index** | **Female Index** |
|---|---|---|---|
| 1 | Hyper Euryproscopic | 78.9 | 76.9 |
| 2 | EuryProscopic | 79 to 83.9 | 77 to 80.9 |
| 3 | Mesoproscopic | 84 to 87.9 | 81 to 84.9 |
| 4 | LeptoProscopic | 88 to 92.9 | 85 to 89.9 |
| 5 | Hyper leptoproscopic | 93 | 90 |

In the present study both Male and female Index falls under LeptoProscopicmale 92.1 (SD±0.40) and female 89.2 (SD±0.19).

**Table-3: Present study was compared with previous workers**.

| **Sl No** | **Name and year** | **Ethnic Group** | **Male Facial Index** | **Female Facial Index** |
|---|---|---|---|---|
| 1 | Mahesh Kumar 2013 | Hariyanvi adults | 86.09 | 84.89 |
| 2 | ZohreAbatobae 2010 | Yazd | 108.3 | 106.9 |
| 3 | AgropnRExhepi 2008 | Kosova Subject | 90.38 | 90.27 |
| 4 | Vaishali Shetty 2010 2011 | a) Indian b) Malayasain (students) | 85.72 | 87.71 |
| 5 | Neeta chhabra 2015 | North India | 90.68 | 89.2 |
| 6 | Present study 2020 | Western Maharashtra | 92.1 | 89.2 |

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