Estimation of Stature from the Facial Width

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Abstract
Aim:
To do a research on the estimation of stature from facial width.
Objective:
This is to assess or estimate approximate height of a person using the dimensions of the facial width.
The cheekbone, called the zygomatic or malar bone, is a paired bone with one bone located underneath each eye socket. Each cheekbone attaches to other facial bones and muscles. Cheekbones are part of skull. After nasal bones cheek bones are most commonly featured facial bones. Zygomatic is significant in evolutionary biology.Facial width dimensions are used to estimate the growth .
Materials and methods
The facial width of the person is measured by using vernier caliper and height of the person will be measured using standard height frame.The study was conducted among 30 South Indians.
Reason:
The study will help in forensic anthropology to estimate the approximate height of the individual .

INTRODUCTION:

Anthropology is the study of humans. It's main subdivision are the cultural anthropology and biological anthropology. Stature estimation is an important parameter in forensic examination for identification of skeletal remains. Stature measurement is also essential for the comparison of different population .Stature represents the length of the body from the head to foot when standing. Usually it is done by measuring the length of long bones.It can also be done by measuring short bones of the hands and feet . In this study we have considered facial width to estimate the stature.
The cheek bone ,called the malar bone is a paired bone with one bone located underneath each eye socket . Zygomatic bone is significant in evolutionary biology . As one of the most durable and recognizable parts of the human skeleton , the facial bone is the most likely element for estimation .
Estimation of stature for the purpose of identification has a significant forensic importance.This technique is based on the principle that the body parts correlate positively with stature[1].

METHODS AND MATERIALS:

The study was conducted in Saveetha Dental College,Tamil Nadu,India during the month of April . The population was selected at random with both genders within the age group 25-30 years . The bi zygomatic width was measured. It is done using the vernier caliper and the height with the help of standard Height Measuring Frame. The height was measured between the vertex and the floor.All the measurements were taken by the same examiner during a fixed time between 10-11 a.m only . This is done in order to avoid the discrepancies due to diurnal variations.The measurements taken were tabulated,analyzed using the regression analysis.

RESULTS:

The related data that was collected is used for calculating the mean value as following:
Number of subjects30(19 females and 11males)
Range of facial width   8.0-12 cms

Mean value of the facial width 9.432 ± 5.72
Range of height of a person   150-185 cms
Mean value of height of a person 161.3 ± 10.3
Using the formula $y=a+bx$
The regression equation was calculated to be $y=150.37+1.16x$
Where, y is the height of the person in cms
x the facial width in cms
a and b are regression constants.

DISCUSSION:

The facial width is often used for the determination of sex dimorphism . In case of forensic findings with the help of facial width the height of the person can be calculated .
Whenever we want to estimate stature from a given bone or human body part,there must be a relation with the bone or body part with the stature. Stature can be estimated either by multiplying the parameter with the derived multiplication factor or with the regression equation .Regression analysis is been used for the best results in most of the studies.[2,3]

In some cases short bone of the fingers have been used for the estimation of the stature. In another research they have used fragmented remains to estimate the stature.
Menezes et al., formulated a linear regression equation from the length of sternum concluded that the length of the sternum is a reliable predictor of stature in adult South Indian females that can be used as a tool for stature estimation when the limbs are not available for the examination.[4]
According to Campobasso et al. scapula sample can be reliably employed for the estimation of stature in forensic practice in absence of intact or fragmented long limb bones[5]. Nagesh et al., estimated the stature from different segments of the vertebral column in the South Indian population.[6] Prasanna L et al.,considered the total facial height (Nasion to Gnathion); upper facial height(Nasion to prosthion)and bizygomatic width(distance between two zygions) in their research to estimate the stature.[7]

Shalini kalia et al., has estimated the stature using the skull. [8] .Kanchankumar et al., has estimated the stature from maxillofacial anthropometry like the total facial height(height between Nasion and Gnathion)and nasal height (height between Nasion and Nasal spinale) [2]heHas found out that in males total facial height has more correlation with stature and in females nasal height has more relation with stature.Some other comparative studies have done to estimate the stature using facial width .

Jibonkumar and Lilinchandra have used six facial dimensions to estimate the stature They had studied 199 subjects and noted that Total Facial Height(THF) was a better parameter to estimate the stature.[9] Similar findings were found by Krishnan (2008),Kharyal et al.,(2008) and Agnihotri et al.,(2011)[2,10&11]

In this research we have used the facial width to estimate the stature .This was done to understand the contribution of the bizygomatic width in stature estimation Also the significance of the regression equation was observed . In this study we have used the linear regression method for the data analysis in 30 South Indian subjects.The value obtained through the regression equation is was calculated to be $y = 150.37 + 1.16x$

CONCLUSION:

This research was done in order to estimate the stature. This would be more significant in case of forensic investigations where even if some parts like head alone is found. The importance of estimation of stature from the different body parts cannot be overlooked. It is found that stature estimation by the use of regression equation varies from each population. Our study will help in estimation of stature from facial width in South Indian population.

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