INTRODUCTION  Gender determination is pivotal in establishing the biological profile of human remains. Secondary to the pelvis, the skull is one of the most important indicators for it. According to the literature, various anatomical features in the skull, such as brow ridge shape and nostril size, have been used. However, in cases of fracture and deformation, these may be futile. Owing to the stability and considerably greater resistance to external factors such as trauma and fractures, the radiological assessment of frontal sinus could be a useful indicator for sexual dimorphism.

AIM  To establish the reliability of morphometric measurements of the frontal sinus for sex determination in an Indian subpopulation.

MATERIALS AND METHOD

Lateral cephalograms of 120 patients > 20 yrs were retrieved from our records following the inclusion and exclusion criteria.

All the lateral cephalograms were obtained in accordance with the standard protocol.

The peripheral border of the frontal sinus was traced using Adobe Photoshop Software.

The maximum height (AB) and width (CD) were used to calculate the frontal sinus index (AB/CD). The frontal sinus area and perimeter were also recorded.

The obtained data was subjected to statistical analysis using SPSS 19 statistical software.

RESULTS

Normality of data was tested using the Shapiro Wilk test. The data was normally distributed, so the Mann Whitney test was applied to the frontal sinus height, width, index, area, and perimeter, which were all statistically significant (p<0.05) except index.

A logistic regression was applied to obtain discriminant function analysis. After putting the values of frontal sinus area, index, and perimeter, a discriminant function equation was derived.

\[ D = 5.604 \times \frac{(\text{AREA})}{\text{(PERIMETER)}} - 0.175 \times \text{INDEX} \]

According to the discrimination criteria, a calculated D value higher than the reference value (D>0.5) indicated male, whereas a calculated D value less than reference value (D<0.5) indicated female gender.

This accurately discriminated our data as 66.7% females and 63.3% males, with an average correct discrimination percentage calculated to be 65%.

CONCLUSION  The goal of our study was to develop a low-cost system for sex determination in the Indian scenario so that it is more suited to the monetary constraints that often plague the disaster management bodies. Our study revealed a 65% accuracy rate in gender determination using frontal sinus height, width, index, area and perimeter. Though the accuracy rate was not found to be very high, yet it being a pilot study, we do suggest that collaborative use of different parameters like area, index and perimeter with a larger sample size might yield more accurate results.

DISCUSSION

<table>
<thead>
<tr>
<th>Author Name</th>
<th>Evaluated Parameters</th>
<th>Type of Radiograph</th>
<th>Software used</th>
<th>% Accuracy</th>
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<tbody>
<tr>
<td>2. Belaldavar et al (2014)</td>
<td>Area, height, width</td>
<td>AP radiograph</td>
<td>Adobe Photoshop</td>
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<tr>
<td>Present study/2021</td>
<td>Height, width, index, area &amp; perimeter</td>
<td>Lateral cephalogram</td>
<td>Adobe Photoshop</td>
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</table>

REFERENCES

1. Luo H, Wang J, Zhang Y, Li C. The application of frontal sinus index and frontal sinus area in sex estimation based on lateral cephalograms among Han ethnicity adults in Xinjiang. Journal of forensic and legal medicine. 2018 May 1;56:


