Assessment of Sexual Dimorphism Using Odontometric Parameters

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Abstract: *Identification of individuals using dental findings plays an important role in assessing sexualdimorphism. Previously various studies done on individuals odontometric parameters have given variable results. The aims and objectives is to assess sexual dimorphism using mesiodistal and labio/buccolingual measurements of maxillary incisors, premolars and molars mandibular canine index, arch width. The present study showed that mean values of all odontometric parameters was significantly higher in males than females. Mean values of facial index was also significantly greater in males than females. There is also a significant increase in all tooth dimensions with increase in facial index of the individual irrespective of the gender.*
Keywords: *sexual dimorphism, facial index*

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I.   Introduction

Dental identification plays a significant role in natural and manmade disaster especially in mass casualties. Sexual dimorphism refers to the differences in size, shape or colour between males and females and is useful tool to distinguish them. Teeth can be used for differentiating sex by measuring their mesiodistal and buccolingual dimensions. Dental indices like mandibular canine index and incisor index also shows variation among males and females. Microscopic examination of dental pulp for the presence of Barr bodies is another method of gender determination.[1] The general built and facies has also shown to have an influence on various tooth parameters.

Previous studies have shown that males and females consistently differ in tooth-crown size.[2] Similar studies have shown that mandibular canines showed significant mean differences in both genders[3].The mesiodistal width of mandible and intercanine arch width has proved to be an useful tool in identification of gender[4] .

Odontometric parameters have been studied independently with inconsistent results in specific population groups, hence, this study aims to assess the sexual dimorphic traits using all odontometric parameters as well as comparing it with the general built and shape of the face in individuals of Kerala origin, both by birth and domicile.

II.   Aim

To assess the presence or absence of sexual dimorphism using odontometric parameters and, if present, its comparison with general built and shape of the face.

III.   Objectives

(1) To assess the labio/bucco lingual and mesiodistal width of maxillary incisors as measured in millimetres using vernier callipers.
(2) To assess the labio/bucco lingual and mesiodistal width of maxillary premolars as measured in millimetres using vernier callipers.
(3) To assess the labio/bucco lingual and mesiodistal width of maxillary molars as measured in millimetres using vernier callipers.
(4) To assess the general built by measuring the height (in centimeters) and weight (in kilograms) of the subjects.
(5) To measure the facial index of the subjects as a ratio.
(6) To compare the tooth parameters with built and facies.

IV. Materials And Methods

The study was conducted in the Department of Oral Pathology & Microbiology, Government Dental College, Thiruvananthapuram. The study group comprises of 100 individuals (50 males and 50 females) in the age group of 17-21 years, who are of Kerala origin by birth and domicile, with fully erupted, healthy and non-worn dentition. Impressions of the dentition were made using alginate impression material and casts were poured immediately to avoid changes in dimension using Type IV dental stone. All the measurements were done using vernier callipers of resolution of 0.02mm. the distance between the highest points on the buccal/labial and lingual/palatal surfaces were measured and analysed.

Fig 1 : measurements done between the highest points on the palatal surfaces of premolar and molar

V. Results

The data was entered in excel sheet and analysis was done using SPSS software. Quantitative variables were expressed as mean and standard deviation. The average age for the subjects was 20 years for males and 19 years for females. The mesiodistal diameter of maxillary central incisors for both right (male – 8.73mm, female – 8.52mm) and left (male – 8.81mm, female – 8.60mm) was higher in males than females. The mesiodistal diameter for first premolar of right side (male – 7.1mm, female – 6.9mm), left side (male – 7.1mm, female – 7.0mm) was higher in males as compared to females. The mesiodistal diameter for maxillary first molar of right side (male – 10.9mm, female – 10.5mm), left side (male – 10.7mm, female – 10.5mm) was higher in males than females. The mandibular canine index for right side (males – 0.84, females – 0.81)and for the left side (males – 0.83, females – 0.81) was higher for males than females. The facial index for males (0.76) was higher than females (0.70) .

VI. Discussion

Sexual dimorphism refers to the differences in size, shape or colour between males and females and is useful tool to distinguish them. Teeth can be used for differentiating sex by measuring their mesiodistal and buccolingual dimensions. Dental indices like mandibular canine index and incisor index also shows variation among males and females. In our study it was observed that mean values for all tooth parametersdid not show significant difference between the two sides for both the genders ($p < 0.05$, NS). Mean values for all tooth parameters was found to be significantly higher in males than females. The values for the facial index were also significantly higher in males than females.

Sexual dimorphism was calculated based on the formula given by Garn and Lewis –

SEXUAL DIMORPHISM= [(Xm–Xf) – 1] * 100

Where Xm and Xf is the average values for males and females respectively.

The present study showed that mean values of all odontometric parameters was significantly higher in males than females. There is also a significant increase in all tooth dimensions with increase in facial index of the individual irrespective of the gender.
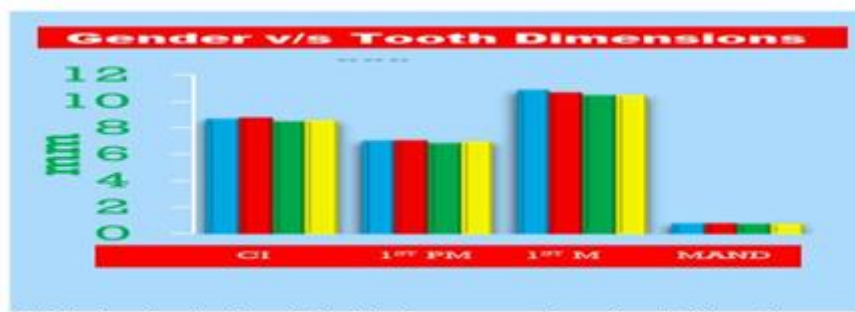
Table 1 – showing the relationship between gender and tooth dimensions

VII. Conclusion

Sex determination using odontometric parameters is a quick and easy method. The present study showed that mean values of all odontometric parameters was significantly higher in males than females. However, tooth dimensions are significantly affected by the facial index of the individual irrespective of the gender. The study showed all tooth parameters increased in males, which may probably be due to the role of androgens and even a genetic aspect cannot also be ruled out.

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