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SEXUAL DIMORPHISM IN JAMMU POPULATION BY ODONTOMETRIC STUDY OF PERMANENT MAXILLARY CANINE

Dental Science

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ABSTRACT

AIM: To investigate whether sexual dimorphism can be established by odontometric study of permanent maxillary canine teeth in jammu Indian population.

STUDY DESIGN: The study was carried out at dr som's dental clinic ,jammu. on cast of patients reporting at clinic. Out of total 160 subjects examined 80 subjects were female and 80 were male. Impressions of the upper arch were made using alginate and casts poured in dental stone. The mesiodistal diameter of the crown of permanent maxillary canine both on right and left sides and inter-canine width were measured. From these measurements, maxillary canine index was calculated. The percentage of sexual dimorphism was assessed for all the paramete.

RESULTS: In the present study, the mesiodistal diameter of maxillary canine for both right (p=0.001) and left side (p=0.005) was significantly higher among male subjects than females, Similar observation was found for inter-canine width too (p=0.001). However, the maxillary canine index for right and left was almost similar (p>0.001) for both male and female subjects.

KEYWORDS

Buccolingual diameter, Mesiodistal diameter, Maxillary canines, Sexual dimorphism, jammu population.

INTRODUCTION -

Teeth are known to be invaluable elements for anthropological, genetic, odontologic, evolutionary and forensic investigations as this organs made up of the most enduring mineralized tissues in the human body.[1] Teeth are extraordinary resistance to putrefaction and the effect of external agents (physical, thermal, mechanical, chemical or biological) which makes it as a valuable forensic tool.[2,3]

Sexual dimorphism refers to the systemic difference in form (either in shape or size) between individuals of different gender in the same species. Sex differentiation in forensic investigation utilises craniofacial morphology, tooth dimensions and DNA analysis.[4]

It has been suggested that odontometrics plays an important role in determination of sex in young individuals where secondary sexual characteristics have not developed. In addition, the resistance of teeth to postmortem insults render them as a valuable tool in forensic investigation .

MATERIALS AND METHODS

Present study was carried out at dr som's dental care. jammu, india.The sample for the study comprised of 160 dental casts that belonged to 80 females and 80 males.

Following verbal consent, impressions of the upper arch were made using alginate material and casts poured in dental stone. The study included young adults with an average age of 25.13 and 30.13 years for male and females respectively and one would have assumed that the dentitions were relatively intact and unaltered by the vagaries of pathology and physiologic wear.

Method for the cast preparation are first impression of upper arch were made using alginate material and then cast poured in dental stone.A few teeth in many of the casts did, however, present restorations, caries, excessive wear or casting defects. If such obstructions impeded tooth measurements, they were not included in the analysis. Mesiodistal diameter (MD) measurements of permanent maxillary canine were obtained using a sliding digital calliper with calibration of 0.01 mm. The measurements were performed by one person and all values were rounded to two decimal places.

Table 1- To Show The Different Parameters Of The Study.

Parameters		Male (n=80)				Female (n==80)	
	Mean ±sd	Min-max	CV (%)	Mean ± sd	Min-max.	CV (%)	p- value
Age in years	23.13 ± 2.85	18-30	3.47	22.13 ± 2.32	18-28	3.47	0.0001*
Right mesiodistal diameter of maxillary canine (in mm.)	8.13 ± 0.67	6.00-11.00	8.31	7.80±0.62	5.53±5.13	8.72	0.001
Left mesiodistal diameter of maxillary canine (in mm.)	8.07 ± 0.71	6.00-11.00	7.45	7.78±0.60	443±5.23	6.88	0.001

Mesio-distal Measurement (MD)

The greatest mesiodistal dimension between the approximate surfaces of the crown was measured with the calliper beaks placed occlusally along the long axis of the tooth. In case of tooth rotation or malposition, the measurements were taken between points on the approximate surfaces of the crown where it was considered that contact with adjacent teeth would have normally occurred.

Sexual Dimorphism (SD)

Sexual dimorphism was calculated using formula given by Garn and Lewis12 as follows:

Sexual Dimorphism=[Xm/Xf]-1 × 100

Where: Xm=Mean value for males; Xf=Mean value for females

STATISTICS AND RESULTS

The mean age for males was 23.13 (±2.85) years and 22.13 (±2.32) years for females (Table 1). MD of maxillary canine for both right (Male-8.13 ± 0.67 mm, Female-7.80 ± 0.62 mm) and left (Male-8.07 ± 0.71 mm, Female-7.79 ± 0.60 mm) side was significantly higher among male subjects than females (p=0.001, p=0.001 for right and left maxillary canine respectively).

Mean age of males was found to be significantly higher as compared to that of females (p=0.001). (Table 1).

Sexual Dimorphism (SD) in right and left MD of maxillary canine was 4.12% and 3.20% respectively.

DISCUSSION

Odontometric features that show sexual dimorphism are used in sex determination in cases where sex could not be determined using craniofacial features. As a means of determining sex, odontometric features have been the subject of research for a long time.

Crowns of permanent teeth are formed at an early stage and their dimensions remain unchanged during further growth and development, Canines have demonstrated a higher degree of sexual dimorphism among the populations and are considerate as one the most resistant teeth in the dentition, remaining intact in several post mortem scenarios except in cases when specific changes and disorders in terms of functionality, pathology and nutrition can have affect on the normal dimensions of a tooth.[5,6] Chromosomes responsible for the sexual difference are in direct connection to growth and development of teeth.[7]

The research performed by Stroud et al.[7] Showed that males have larger mesiodistal diameters of single teeth, which is due to a thicker dentin layer.[7] The dimensions of canine teeth were studied by several methods which include Moire's topography and Fourier's analysis and measurement of linear dimensions, such as mesiodistal width, buccolingual width and incisocervical height. The use of Moire's topography and Fourier's analysis were limited to small samples whereas measurements of linear dimensions of canine teeth was employed in a large population because it is simple, reliable, inexpensive and easy to perform.

In the present study subjects, with age ranging from 18 to 30 years, were selected because eruption of canines and growth in width of both the jaws, including the width of the dental arches, are completed before the adolescent growth changes. The inter-canine distance do not increase after 12 years of age.[8]

The present study showed that MD of maxillary canines was significantly greater in males than females. Males having values on the right side 8.13 ± 0.67 mm and on left side 8.07 ± 0.71 mm while females having values 7.80 ± 0.70 mm (right) and 7.79 ± 0.60 mm (left) .This was in accordance with the study conducted by Parekh et al.[9] Their study found these values as 6.923+0.611 mm (right) and 7.098+0.535 mm (left) in males, and 6.359+0.526 mm (right) and 6.617+0.51 mm in females with a statistically significant difference in males and females. Rao et al.[10] have demonstrated that inter-canine distance and canine index are useful parameters as measured in differentiating the sexes.

CONCLUSION

From the present study, it can be concluded that mesiodistal and buccolingual diameter of the permanent maxillary canine was greater in males than in females and the difference was statistically significant Odontometrics is a quick and easy method for determining sex.

To summarize, the present study gave the following results:
The widths of the mandibular and maxillary right and left canine teeth were almost bilaterally symmetrical in females and males.

The mean values for left and right mandibular and maxillary canine widths were less for females than for males and the differences were statistically significant.

REFERENCES

1 Brkić H, Forenzična stomatologija. Školska knjiga, Zagreb, (2000). Astete JC, San Pedro VJ, Suazo GI,
2 Sexual dimorphism in the tooth dimensions of Spanish and Chilean peoples. Int J Odontostomat, 3(1):47-50, (2009).
3 Williams PL, Bannister LH, Berry MM, Collin SP, Dyson M, Dussek JE, Fergusson MWJ, 2000 Gray's Anatomy. In: The Teeth, Churchill Livingstone, London, 38th Edn:169-170.
4 Bilge Y, Kedici PS, Alakoç YD, Ulküer KU, Ilkyaz YY (2003) The identification of a dismembered human body: a multidisciplinary approach. Forensic Sci Int 137: 141-146.
5 Işcan MY, Kedici PS, Sexual variation in bucco-lingual dimensions in Turkish dentition. Forensic Sci Int, 137:160-164, (2003).
6 Lund H, Mornstad H, Gender determination by odontometrics in a Swedish population. J Forensic Odontostomatol, 17(2):30-34, (1999).
7 Stroud JL, Buschang PH, Goaz PW (1994) Sexual dimorphism in mesiodistal dentin and enamel thickness. Dentomaxillofac Radiol 23: 169-171.
8 Proffit MR, Field HW Jr, Ackerman JL, Thompson PM, Tullock SAC (1984) Contemporary orthodontics. St. Louis: CV Mosby Co: 84-89.
9 Parekh DH, Patel SV, Zalawadia AZ, Patel SM (1995) Odontometric study of maxillary canine teeth to establish sexual dimorphism in Gujarat population. Int J Biol Med Res 3: 1935-1937.
10 Rao NG, Rao NN, Pai ML, Kotian MS (1989) Mandibular canine index--a clue for establishing sex identity. Forensic Sci Int 42: 249-254.