

**"SEXUAL DIMORPHISM IN HUMAN PERMANENT MANDIBULAR AND
MAXILLARY CANINES IN GWALIOR REGION"****¹Harendra Singh, ²Reeta Kushwaha and ³Naveen Kushwah**¹Assistant Professor, Department of Anatomy, Gajra Raja Medical College, Gwalior, M.P., India.²Demonstrator, Department of Anatomy, Gajra Raja Medical College, Gwalior, M.P., India.³Associate Professor, Department of Surgery, Gajra Raja Medical College, Gwalior, M.P., India.***Corresponding Author: Naveen Kushwah**

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ABSTRACT

Introduction: Teeth are an excellent material in living and non living populations for anthropological, genetic, odontologic and forensic investigations. "Sexual Dimorphism" refers to those difference in size, stature and appearance between male and female that can be applied to dental identification. Canines are the most stable teeth in the dental arches. Aim of this to study the impacts of 'sex factors' on the morphometry of human canines. **Material and methods:** 180 subjects, 90 males and 90 females in the age group of 17-23 years were selected for this study. The study was conducted on the undergraduate students of 1st year of Gajra Raja Medical College, Gwalior. The measurements of the mesiodistal width of teeth were taken by using a sliding Vernier caliper. The intercanine distance was measured between the tips of the mandibular canines and then between the tips of the maxillary canines, intraorally. **Results:** A highly significant sexual dimorphism can found in the human permanent canines in their mesiodistal crown diameters in the present study. The right mandibular canine was found to be most sexual dimorphic as all the canines followed by right maxillary canine, left mandibular canine and left maxillary canine. **Conclusion:** It was concluded that the mesiodistal width of all four canines are significantly different in male and female as are the mandibular maxillary canines indices. The mandibular intercanine distance was not significantly different. The mean value for mesiodistal crown diameters were established.

INTRODUCTION

Teeth are an excellent material in living and non-living populations for anthropological, genetic, odontologic and forensic investigations. Being the hardest and chemically the most stable tissues in the body.^[1]

Tooth size standards based on odontometric investigations can be used in age and sex determination. "Sexual Dimorphism" refers to those difference in size, stature and appearance between male and female that can be applied to dental identification because no two mouths are alike. The permanent canines are the "single" members of the dental arches.^[2,3] Canines are the most stable teeth in the dental arches. Sexual dimorphism in canine teeth is widespread among living anthropoid primates.^[4,5]

Aims of this study to investigate the accuracy with which gender can be differentiated by odontometric analyses of mandibular and maxillary canines and the impacts of 'sex factor' on the morphometry of human canines.

MATERIAL AND METHODS

180 subjects, 90 males and 90 females in the age group of 17-23 year were selected for the study. The study was

conducted on the undergraduate students of First Year of Gajra Raja Medical College, Gwalior.

The mesiodistal width of the crown of the mandibular and maxillary canines were directly measured intraorally by using sliding Vernier Caliper. The mesial and distal surfaces of the teeth were identified and the distance between the crest of curvature on the mesial surface and crest of curvature on the distal surface was recorded by the divider points applied on them which was then held against the Vernier caliper and read. This measurement of the mesiodistal width was done on both right and left sides on mandibular and maxillary canines.

The inter canine distance was measured between the tips of the mandibular canines and then between the tip of the maxillary canines.

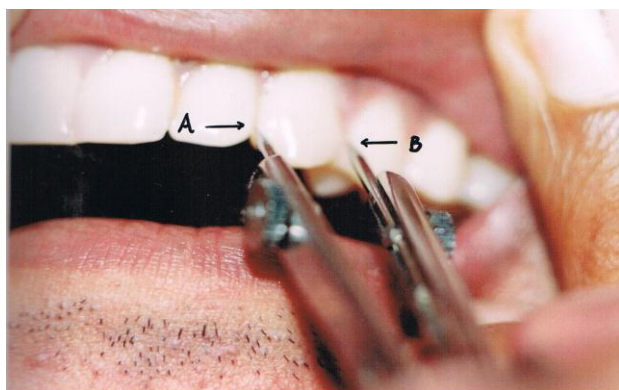


Figure 1: Measurement of Mesiodistal width of left maxillary canine (A) Midpoint of Mesial contact area, (B) Midpoint of Distal contact area.

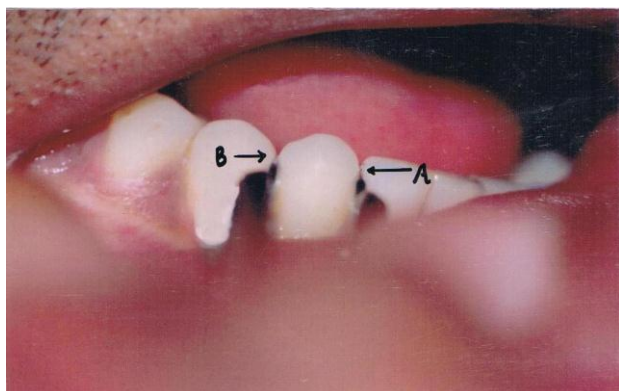


Figure 2 : Measurement of mesiodistal width of right mandibular canine (A) Midpoint of Mesial contact area, (B) Midpoint of Distal contact area.

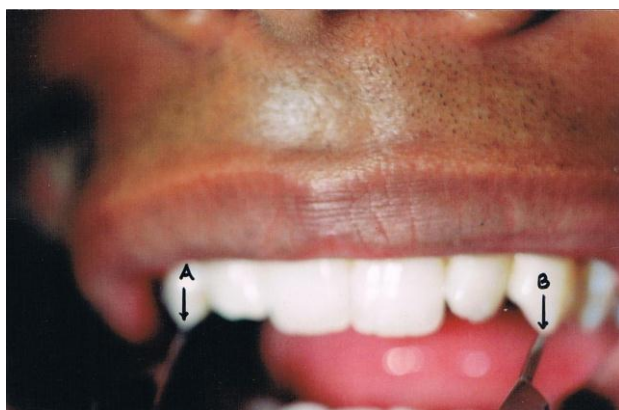


Figure 3 : Measurement of intercanine distance for maxillary canine (A) Tip of right maxillary canine, (B) Tip of left maxillary canine.

RESULTS

A highly significant sexual dimorphism can be found in the human permanent canines in their mesiodistal crown diameters in the present study. The right mandibular canine was found to be most sexual dimorphic as all the canines followed by right maxillary canine, left mandibular canine and left maxillary canine.

Table 1: Mesiodistal width of right mandibular canine.

| Statistics | Males | Females |
|--------------|--------------------|------------------|
| Range | 0.64 cm – 0.8 cm | 0.5 cm – 0.77 cm |
| Mean | 0.73533 cm | 0.65356 cm |
| SD | 0.04246 cm | 0.04913 cm |
| Variance | 0.0018 | 0.00241 |
| Z value | 11.95293 | |
| Significance | Highly significant | |

Table 2 : Mesiodistal width of left mandibular canine.

| Statistics | Males | Females |
|--------------|--------------------|-------------------|
| Range | 0.61 cm – 0.83 cm | 0.58 cm – 0.78 cm |
| Mean | 0.73944 cm | 0.67133 cm |
| SD | 0.04418 cm | 0.05265 cm |
| Variance | 0.00195 | 0.00277 |
| Z value | 21.9599 | |
| Significance | Highly significant | |

Table 3 : Mesiodistal width of right maxillary canine.

| Statistics | Males | Females |
|--------------|--------------------|------------------|
| Range | 0.7 cm – 0.98 cm | 0.6 cm – 0.82 cm |
| Mean | 0.81322 cm | 0.72733 cm |
| SD | 0.05721 cm | 0.0514 cm |
| Variance | 0.00327 | 0.00264 |
| Z value | 10.60462 | |
| Significance | Highly significant | |

Table 4 : Mesiodistal width of left maxillary canine.

| Statistics | Males | Females |
|--------------|--------------------|-------------------|
| Range | 0.68 cm – 0.98 cm | 0.61 cm – 0.85 cm |
| Mean | 0.81433 cm | 0.74044 cm |
| SD | 0.05422 cm | 0.05534 cm |
| Variance | 0.00294 | 0.00306 |
| Z value | 9.0542593 | |
| Significance | Highly significant | |

Table 5 : Mandibular intercanine distance.

| Statistics | Males | Females |
|--------------|------------------|------------------|
| Range | 2.1 cm – 3.14 cm | 2.1 cm – 3.55 cm |
| Mean | 2.57633 cm | 2.560222 cm |
| SD | 0.215409 cm | 0.274149 cm |
| Variance | 0.046401 | 0.075158 |
| Z value | 0.171105 | |
| Significance | Not significant | |

Table 6 : Maxillary intercanine distance.

| Statistics | Males | Females |
|--------------|--------------------|------------------|
| Range | 2.9 cm – 4.2 cm | 2.55 cm – 3.7 cm |
| Mean | 3.473556 cm | 3.266667 cm |
| SD | 0.235723 cm | 0.25726 cm |
| Variance | 0.055565 | 0.065396 |
| Z value | 5.6435765 | |
| Significance | Highly significant | |

DISCUSSION

The mean mesiodistal width of the left mandibular canine was found to be 0.7394 cm for males, the standard deviation is being 0.04418 cm and 0.6713 cm for females, the standard deviation being 0.05265. The result for the mandibular canines are comparable to those found by Kaushal et al (2003).^[6] They found the mean mesiodistal width of left mandibular canine to be 0.7299 cm in males and 0.6693 cm in females.

The mean mesiodistal width of right mandibular canine was found to be 0.7353 cm in males, standard deviation being 0.04246 cm and 0.6535 cm in females, standard deviation being 0.04913 cm with 'z' value being 11.952. These are also similar to those obtained by Kaushal et al (2003).^[6] They found mesiodistal width of right mandibular canine to be 0.7229 in males and 0.690 cm in females.

In the present study mean mesiodistal width of left maxillary canine was obtained as 0.81433 cm for males with standard deviation 0.05422 and 0.74044 cm for females with standard deviation 0.05534. The 'z' value from both was computed out to be 9.054. The results obtained by Garn and Lewis^[7] for maxillary canine is 0.793 cm as the mean mesiodistal width.

The mean mesiodistal width of right maxillary canine was found to be 0.8132cm in males, standard deviation being 0.05721 cm and 0.7273 cm in females, standard deviation being 0.0514 cm with 'z' value being 10.6046. Legovic MI et al^[8] got the values of 0.80 cm in males and 0.766 cm in females.

The maxillary means intercanine distance in the present study was found to be 3.4735 cm in males and 3.2666 cm in females. Quimby ML^[9] found it to be 3.655 as average.

The mean distance between the distance margin of mandibular canines came out to be 3.041 cm in males and 2.9664 cm in female. The difference in the mean was found to be highly significant.

The present study establishes the existence of a define statistically significant sexual dimorphism in mandibular canines.

CONCLUSION

The mesiodistal widths of all four canines are significantly different in males and females, as are the mandibular and maxillary canine indices. Among the canines right mandibular canine was found to be most dimorphic followed in order by right maxillary canine, left mandibular canine and lastly left maxillary canine. The mean values for mesiodistal crown diameter were established.

REFERENCES

1. Williams PL, Bannister LH, Berry MM et al. The teeth. In: Gray's Anatomy. Churchill Livingstone, New York, 38th edition, 2000; 1704.
2. Black TK. Sexual dimorphism in the tooth crown diameters of the deciduous teeth. Am J Phys Anthropol, 1978; 48: 77-82.
3. Camps FE. Identification by the skeletal structures. In: Grdwohl's Legal Medicine. John Wright and Sons, 3rd edition, 1976; 110.
4. Perzigian A. The dentition of the Indian Knoll skeletal population Odontometrics and cusp number. Am J Phys Anthropol, 1976; 44: 113-122.
5. Plavcan JM, van Schaik CP. Intrasexual competition and canine dimorphism in anthropoid primates. Am J Phys Anthropol, 1992; 87: 461-47.
6. Kaushal S, Patnaik VVG, Angihotri G. Mandibular canines in sex determination. J Anat Soc India, 2003; 52(2): 119-24.
7. Garm SM, Lewis AB, Kerewsky RS. The relationship between sexual dimorphism in tooth size and body size as studied within familis. Arch Oral Biol, 1967; 12(2): 299-301.
8. Legovic M, Novosel A, Legovic A. Regression equations for determining mesiodestal crown diamters of canines and premolars. Angle Orthodontist, 2003; 73(3): 314-318.
9. Quimby ML, Vig KWL, Rashid RG, Firestone AR. Angle Orthod, 2003; 74: 298-303.