

Comparing permanent tooth sizes (Mesio-distal) of males and females in a Nigerian population

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Summary

Two hundred and fifty school children in Ibadan metropolis, comprising of 125 male and 125 females were chosen by modified random sampling to study their tooth sizes (mesio-distal width) and to establish if there is any appreciable sex-difference in their permanent tooth sizes. The teeth measured were selected based on certain criteria. The mesio-distal width of a tooth was recorded as the maximum distance between the tooth sides (proximal) of a tooth on a line parallel to the occlusal and buccal surfaces. The result showed that the male teeth were consistently larger than the female teeth. The summed total maxillary and mandibular arch width of the males were 3.31mm and 1.37mm greater than those of the females respectively. The differences in tooth size between males and females have been established.

Keywords: *Tooth sizes, Nigerians*

Résumé

Deux cents cinquante écoliers dans la métropole d'Ibadan composé de 125 hommes et 125 femmes ont été choisis à travers un échantillonnage au hasard modifié afin d'étudier la grosseur de leurs dents (la largeur mésiodistale) et d'établir s'il y a aucune différence sexuelle notable en ce qui concerne les grosseurs de leur dent permanente. Les dents mesurées ont été sélectionnées d'après certains critères. La largeur mésiodistale d'une dent était notée comme la distance maximale entre les côtés des dents (proximal) d'une dent à une ligne parallèle à l'occlusion molaire et aux surfaces bucaux. Le résultat a indiqué que les dents des hommes sont plus constamment grandes que les dents des femmes. La somme totale de la largeur de la voute maxillaire et mandibulaire des hommes étaient 3,31mm et 1,37mm plus grand que ceux des femmes respectivement. La différence dans les grandeurs des dents entre les hommes et les femmes est donc établi.

Introduction

Man has a heterodont dentition, which means that there is more than one type of tooth found in his dentition. Each quadrant of the permanent dentition normally contains 8 teeth of different types and function namely:

- i. Incisors (2) The two teeth of each quadrant which are closest to the midline are named central and lateral incisors there are four permanent incisors per arch and a total of eight in the mouth.
- ii. Canine (1) The canine is the 3rd tooth from the midline in each quadrant. There are two permanent canine per arch and a total of 4 in the mouth.
- iii. Premolars (2) These are the 4th and 5th tooth from the midline they are called the 1st and 2nd premolars there are four premolars per arch and eight total premolars in the mouth.
- iv. Molars (3) These are the 6th, 7th, and 8th teeth from the midline. There are six permanent molars per arch and a total of twelve.

Some studies have demonstrated the fact that there is an appreciable sex-differences in mesio-distal tooth width of males and females.^{2,4} The aim of this study is to establish if there is any significant difference in the tooth sizes of Nigerian males and females.

Materials and Methods

Two hundred and fifty secondary school children comprising of (125 males) and (125 females) residing in Ibadan Metropolis were studied. Their age ranged between 12 years and 15 years, usually at this age group all permanent teeth except the 3rd molars would have erupted. They were randomly chosen and criteria for selection were based on the following:

- i. Presence and complete eruption of all permanent teeth excluding 3rd molars. These were excluded because of the age group as the 3rd molar usually erupt from 18 years.
- ii. Intact dentition with no fracture/caries
- iii. No conservative treatment except class I cavities
- iv. No congenital defect or deformed teeth.
- v. No developmentally missing teeth in any of the arches.

Impressions of upper and lower jaws of all subjects were taken using alginate impression material (empress alginate, psp Ltd. UK) at ratio 1: 1 of powder and water. This was thoroughly mixed and put in impression trays, this were then placed in the mouth and allowed between 1 - 2 minutes to set, before removing the trays. The trays were rinsed under running water and dental casts were reproduced from them using Dental stone material, which had been mixed with water according to manufacture's instruction (Quayle Dental, UK, ratio 2 : 1 powder and water).

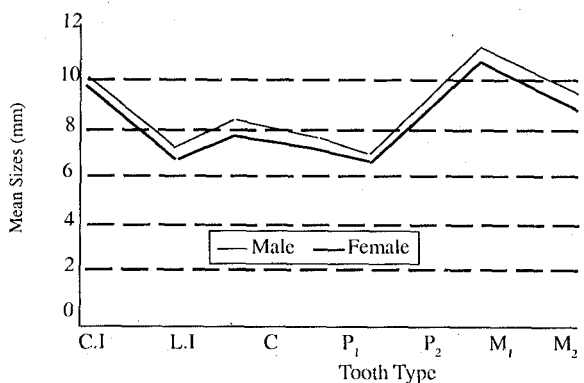
The dental casts were removed from the impression when they were fully set and then numbered for easy identification. The male casts were separated from the female casts.

The Mesio-distal width of each individual tooth was measured under clear light with the aid of a Venier Callipers with Venier Scale to read to the nearest 0.1mm. The mesio-distal width was recorded as the maximum distance between the two sides of tooth (proximal) on a line parallel to the occlusal and buccal surface.

To avoid error, the casts were re-measured. When the difference in reading for the same tooth varied by 0.2mm or less, the measurement were averaged. In few instances in which the two measurements different by more than 0.2mm the teeth were re-measured. The data were subjected to statistical analysis using a computer software package (Epi-Info 6.0) with the mean, standard deviation, range and coefficient variations calculated.

Results

The results showed that male teeth are consistently larger than female teeth as shown in Tables 1 and 2 and Figures 1 and 2.



The tooth of both sexes shows similar relative mean sizes

Fig. 1 Graphic representation of the mean mesiodistal dimension of the crowns of the permanent teeth of Nigerians (Maxilla)

Table 1 Comparative analysis between male and female mesio-distal crown dimension showing the mean, standard deviation, variance and P value

Maxilla											
Tooth	No	Male				No	Female				Pvalue
		Mean size (mm)	Range	S. D.	Variance		Mean size (mm)	Range	S. D.	Variance	
C. I.	237	9.67	7.5 - 11.0	0.66	0.43	239	9.32	7.5 - 11.5	0.72	0.51	0.000
L.I.	240	7.72	6.0 - 9.5	0.62	0.38	231	7.49	6.0 - 9.5	0.71	0.50	0.000
C	206	8.26	6.5 - 10.0	0.80	0.64	220	7.92	7.0 - 9.5	0.53	0.28	0.000
P ₁	223	7.85	6.5 - 9.0	0.60	0.36	241	7.61	6.0 - 9.0	0.55	0.30	0.000
P ₂	200	7.14	6.0 - 9.0	0.63	0.33	233	7.03	5.5 - 8.5	0.60	0.36	0.053
M ₁	245	11.05	9.5 - 13.0	0.66	0.43	247	10.61	7.0 - 13.5	0.71	0.57	0.000
M ₂	140	9.96	8.5 - 12.0	0.62	0.38	167	9.64	8.0 - 11.5	0.69	0.47	0.000

Key:

C.I. Central Incisor C Canine P2 Second Premolar M2 Second Molar
 L.I. Lateral Incisor PI First Premolar M1 First Molar S. D. Standard Deviation

The differences between male and female mesio-distal crown dimension are statistically significant as indicated by the P value. They are however not affected by height, size and age of the individual.

studies that have been done in other countries.^{5,6}

The mean mesio-distal width for the 2nd mandibular molars in females (9.90mm) was slightly higher than that of the males (9.78mm) this may not be regarded as significant because the ranges

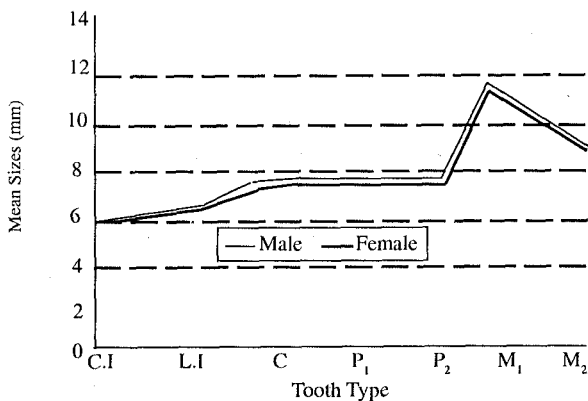
Table 2 Comparative Analysis between male and female mesio-distal crown dimension showing the mean, standard deviation, variance and P value

Mandible											
Male Tooth	No	Mean Size (mm)	Range	S.D.	variance	No	Female Mean size (mm)	Range	S. D.	Variance	Pvalue
L. I.	225	6.52	5.5 - 7.5	0.49	0.24	227	6.44	5.5 - 7.5	0.41	0.16	0.005
C	214	7.67	6.0 - 8.5	0.59	0.24	224	7.33	6.0 - 9.5	0.50	0.25	0.000
P ₁	219	7.86	6.5 - 9.0	0.58	0.33	231	7.71	6.0 - 9.0	0.49	0.24	0.000
P ₂	207	7.72	6.0 - 9.0	0.61	0.37	221	7.63	6.0 - 8.5	0.48	0.23	0.008
M ₁	229	11.71	8.0 - 13.5	0.74	0.54	237	11.67	9.0 - 13.0	0.70	0.49	0.054
M ₂	144	9.78	8.5 - 11.5	0.75	0.54	164	9.90	8.5 - 11.5	0.70	0.49	0.014

Pvalue > 0.05 not significant

Pvalue > 0.05 significant

Pvalue > 0.001 highly significant



The tooth of both sexes shows similar relative mean sizes

Fig. 2 Graphic representation of the mean mesiodistal dimension of the crowns of the permanent teeth of Nigerians (Mandible)

The mean tooth sizes of the males are higher than those of the females. The total maxillary arch width in males was 123.4mm while that of females was 119.05mm giving a difference of 3.31mm while the total mandibular width of males was 1.37mm greater than that of females.

Discussion

From the results shown in graphic and tabular form, the mean mesio-distal tooth width of Nigerian males were consistently higher than those of the females. They are also statistically significant as shown in the tables 1 & 2 by the Pvalue. This agrees with other

were still the same (8.5 - 11.5mm). The total sum of mesio-distal tooth width in the maxilla was 123.4mm while that of the female was 119.0mm giving a difference of 3.31mm confirming that the maxillary width of the male was wider than that of females. The increase in maxillary and mandibular arch of Nigerian males and females has been reported in literature.^{7,8} This is because Nigerians tends to present with Bimaxillary protrusion.

The total mesio-distal tooth width in the mandible was 114.4mm for males and 113.08mm for females giving a difference of 1.131mm confirming that the male mandibular arch width length of males are wider than that of females.⁹

Difference in size of Nigerian male and female teeth have been established further studies could be done to compare Nigerian teeth with those of Caucasians.

Conclusion

This study has been done in a Nigerian population to conclude the fact that there is an appreciable sex-difference in the size of teeth.^{6,9} The male teeth were generally larger than the female teeth.

It is in agreement with other studies done in Americans and Jordanians where mean mesio-distal tooth sizes of male teeth were higher than those of females.^{9, 10}

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