

# Comparing permanent tooth sizes of Nigerians and American Negroes

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## Summary

A study of two hundred and fifty secondary school children (125 males and 125 females) in Ibadan metropolis was done, to determine mean tooth sizes for the population. The data obtained in Nigerians were then compared with a similar data obtained in American Negroes by Richardson and Malhotra (1975)<sup>1</sup>. This was done on computer using the Student T-test and taking a probability value greater than 1% ( $P > 0.01$ ) as not significant.

The results showed that there was no significant difference in tooth sizes of Nigerians and American Negroes. This could be genetically linked, signifying that Black Americans may have originated from Africa<sup>2</sup>.

**Keywords:** Permanent tooth sizes, Nigerians, American Negroes.

## Résumé

Une étude de deux cents cinquante écolier d'école secondaire (125 mâle et 125 féminins) dans la métropole d'Ibadan a été effectuée afin de déterminer le grosseur moyen de la dent pour la population. Les données obtenues chez les Nigerians ont été comparées par rapport aux données semblables obtenues chez des nègres américains Richardson et Malhotra 1975<sup>1</sup>. Ceci a été effectué à l'aide d'un ordinateur à travers la méthode Etudiant T-test tout en faisant attention à la valeur de la probabilité plus de 1% ( $P > 0,01$ ) étant sans d'importance. Le résultat a indiqué qu'il n'y a aucun écart d'importance dans les grosseurs des dents des Nigériens et des Nègres Américains. Ceci pourrait être lié génétiquement ce qui fait connaitre que les Noirs Américains pourront être d'origine del'Afrique<sup>2</sup>.

## Introduction

A search of literature reveals very little information on the sizes of permanent teeth of Nigerians and Black Americans while a handful of literature exist on tooth sizes of Caucasians and other races. The largest sample size so far reported on the tooth sizes of Nigerians have been that of Mack P.J.<sup>3</sup> while those on American Negroes have been by Richardson and Malhotra in 1975 where normal values were established for male and female American Negroes. The aim of this paper is to compare the mesiodistal crown dimensions of Nigerians and American Negroes.

## Materials and methods

The sample size consisted of Two hundred and fifty secondary schools (125 males and 125 females) which were chosen by random sampling. Their age ranged from 13 – 15 years; (mean age  $13.9 \pm 0.83$ ). Impressions of their upper and lower jaws were taken with a stock tray and alginate impression material. The impressions were immediately cast in Dental stone to avoid dimensional changes. Teeth measured were based on certain criteria which included:

1. Presence and complete eruption of all permanent teeth except the 3rd molars which were not included considering the age group selected.
2. Intact dentition with no fracture.
3. No conservative treatment except class 1 occlusal cavities.
4. No deformed or congenital defect of the teeth
5. No developmentally missing teeth in any of the arches
6. No history of previous orthodontic treatment

The teeth were measured on Dental cast with the aid of

**Table 1** Values for male and female mesio-distal crown dimension showing the mean, standard deviation and co-efficient of variance

Tooth	No	Male					Maxilla				
		Mean Size (mm)	Range	S.D	C.V	No	Female Mean Size (mm)	Range	S.D	C.V	
C.1	237	9.67	7.5 – 11.0	0.66	6.82	239	9.32	7.5 – 11.0	50.72	7.72	
L.1	240	7.72	6.0 – 9.5	0.62	8.03	231	7.49	6.0 – 9.5	0.71	9.48	
C	206	8.26	6.5 – 10.0	0.80	9.68	220	7.92	7.0 – 9.5	0.53	6.69	
P <sub>1</sub>	223	7.85	6.5 – 9.0	0.60	7.64	241	7.61	6.0 – 9.0	0.55	7.23	
P <sub>2</sub>	200	7.14	6.0 – 9.0	0.63	8.82	233	7.03	5.5 – 8.5	0.60	8.53	
M <sub>1</sub>	245	11.05	9.5 – 13.0	0.66	5.67	247	10.61	7.0 – 13.5	0.71	7.16	
M <sub>2</sub>	140	9.96	8.5 – 12.0	0.62	6.22	167	9.64	8.0 – 11.5	0.69	7.15	

The mean width of the male teeth are higher than those of the females for each individual teeth

C.1 – Central Incisor  
L.1 – Lateral Incisor

C – Canine  
P1 – First Premolar

P2 – First Premolar  
M1 – First Molar

M2 – Second Molar  
S. D. – Standard Deviation

C.V. – Co-efficient of variation

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**Table 2** Values for male and female mesio-distal crown dimension showing the mean, standard deviation and co-efficient of variance

Tooth	No	Male				Mandible				
		Mean Size (mm)	Range	S.D	C.V	No	Female Mean Size (mm)	Range	S.D	C.V
C.1	219	5.96	5.0 - 7.0	0.47	7.88	223	5.86	5.0 - 7.0	0.40	6.82
L.1	225	6.52	5.5 - 7.5	0.49	7.51	227	6.44	5.5 - 7.5	0.41	6.36
C	214	7.67	6.0 - 8.5	0.59	7.69	224	7.33	6.0 - 9.5	0.50	6.82
P <sub>1</sub>	219	7.86	6.5 - 9.0	0.58	7.69	231	7.71	6.0 - 9.0	0.49	6.35
P <sub>2</sub>	207	7.72	6.0 - 9.0	0.61	7.90	221	7.63	6.0 - 8.5	0.48	6.29
M <sub>1</sub>	229	11.71	8.0 - 13.5	0.74	6.32	237	11.67	9.0 - 13.0	0.70	5.99
M <sub>2</sub>	144	9.78	8.5 - 11.5	7.56	6.22	164	9.90	8.5 - 11.5	0.70	7.07

The mean of the male mandibular teeth are higher than those of the females

**Table 3** Comparative analysis of female mesio-distal crown dimension of Nigerians and American negroes

Tooth	(Nigerian) Female Present study			(American Negro) Females Richardson & Malhotra (1975)				
	No	Mean size (mm)	Variance	No	Mean size (mm)	Variance	P-value	Significance
C1	239	9.32	0.51	156	8.72	0.33	0.00	N/S
L1	231	7.49	0.50	156	7.08	0.31	0.00	N/S
C	220	7.92	0.28	145	7.74	0.14	0.00	N/S
P <sub>1</sub>	223	7.61	0.30	148	7.37	0.18	0.00	N/S
P <sub>2</sub>	241	7.03	0.36	138	6.94	0.15	0.1	N/S
M <sub>1</sub>	233	10.61	0.57	150	10.57	0.27	0.5	N/S
M <sub>2</sub>	167	9.64	0.47	112	10.35	0.53	0.00	N/S

There was no significant difference between the sizes of teeth of Nigerians and American Negroes

**Table 4** Comparative Analysis of mesio-distal crown dimension of Nigerians and American negroes

Tooth	(Nigerian) Female Present study			(American Negro) Females Richardson & Malhotra (1975)				
	No	Mean size (mm)	Variance	No	Mean size (mm)	Variance	P-value	Significance
C1	223	5.86	0.16	160	5.38	0.15	0.00	N/S
L1	227	6.44	0.16	161	5.99	0.21	0.00	N/S
C	224	7.33	0.25	158	6.86	0.17	0.00	N/S
P <sub>1</sub>	231	7.71	0.24	156	7.41	0.25	0.00	N/S
P <sub>2</sub>	221	7.63	0.23	143	7.61	0.25	0.0	N/S
M <sub>1</sub>	237	11.67	0.49	127	11.28	0.28	0.5	N/S
M <sub>2</sub>	164	9.90	0.49	102	10.98	0.53	0.00	N/S

P-value was not significant. No significant difference was found between the Nigerians mesio-distal crown dimension and those of the American Negroes.

Vernier Callipers under clear light to the nearest 0.1mm. In order to remove memory bias, the measurement were repeated at interval of two weeks and the mean between the 1st and 2nd measurements were taken to represent actual reading. The data

obtained on Nigerians was subjected to statistical analysis using a computer software package (EPI-Info version 6.0).

The mean standard deviation and co-efficient of variation were calculated. The data obtained on Nigerians were then

**Table 5** Comparative analysis of male mesio-distal crown dimension of Nigerians and American Negroes

Maxilla								
Tooth	(Nigerian) male Present study			(American Negro) male Richardson & Malhotra (1975)				
	No	Mean size (mm)	Variance	No	Mean size (mm)	Variance	P-value	Significance
C1	237	9.67	0.43	153	9.12	0.44	0.00*	N/S
L1	240	7.72	0.38	159	7.26	0.40	0.00*	N/S
C	206	8.26	0.64	142	8.19	0.28	0.36	N/S
P <sub>1</sub>	223	7.85	0.36	146	7.66	0.24	0.001	N/S
P <sub>2</sub>	200	7.14	0.39	148	7.25	0.24	0.7	N/S
M <sub>1</sub>	245	11.05	0.43	148	11.04	0.40	0.08	N/S
M <sub>2</sub>	140	9.96	0.38	104	10.74	0.39	0.00*	N/S

N.S. – Not significant

\* –  $P < 0.01$ .

**Table 6** Comparative analysis of male mesio-distal tooth dimension of Nigerians and American Negroes

Mandible								
Tooth	(Nigerian) male Present study			(American Negro) male Richardson & Malhotra (1975)				
	No	Mean size (mm)	Variance	No	Mean size (mm)	Variance	P-value	Significance
C1	219	5.96	0.22	158	5.53	0.15	0.00	N/S
L1	225	6.52	0.24	159	6.13	0.19	0.00	N/S
C	214	7.67	0.34	148	7.37	0.32	0.00	N/S
P <sub>1</sub>	219	7.86	0.33	150	7.76	0.26	0.08	N/S
P <sub>2</sub>	207	7.72	0.37	147	7.85	0.30	0.03	N/S
M <sub>1</sub>	229	11.71	0.54	136	11.76	0.51	0.9	N/S
M <sub>2</sub>	144	9.78	0.54	80	11.53	0.73	0.00	N/S

No significant difference existed between the mesio-distal crown dimension of Nigerians and those of American Negro except the second premolars where p-value was 0.03 but still greater than 0.01

$P > 0.05$  – Not significant       $P 0.01$  – Highly significant      N.S. – Not significant  
 $P 0.05$  – Significant              S – Significant

compared with those of American Negroes using the student T-test.

**Results**

The descriptive statistics on mesio-distal crown dimensions in Nigerian males and females are shown on Tables 1 & 2. Comparative analysis of tooth sizes between Nigerians and American Negroes are shown in Table 3 – 6.

The results showed that there is no significant difference between the tooth sizes of Nigerians and American Negroes using the student's T test with a probability value greater than 1%  $P > 0.01$ .

**Discussion**

Dunn and Dobzhansky<sup>4</sup> had indicated that all men belong to a single species but men inhabiting different parts of the world are exposed to different nature and are not all alike. The tooth sizes of Nigerian were very similar to those of American Negroes. The sample size provided very reliable data in both

racers. In Nigerians, it has been the largest sample size for tooth measurement while the same is true for those of Black Americans<sup>1</sup>. The sample size allowed for comparison on computer using the student's T-test. It was easier using secondary school children in Nigerians as they presented with a larger sample size. On the other hand sample size for the American Negro was drawn from three different sources representing a cross section of Negro community socio-economically. The result of this study agrees with other studies on the relative sizes of premolars to each other<sup>5-7</sup>. The maxillary 1st premolars of Nigerians are larger than the 2nd maxillary premolars. The same can be said for the 1st and 2nd maxillary molars. This similarity in dentition agrees with Richardson and Malhotra study<sup>1</sup> on tooth sizes of Black Americans.

**Conclusion**

In conclusion, permanent teeth of Nigerians and Black Americans are similar in mesio-distal size. They are however different in size from Caucasian teeth<sup>8</sup>.

**References**

1. Richardson ER and Malhotra SK. Mesio-distal crown dimension of the permanent dentition of American Negroes Am. J. Orthodontics 1975; 68: 157 – 64.
2. Garner IO and Butt MN. Malocclusion in Black Americans and Nyeri-Kenyans – An epidemiologic study. Angle orthodontist 1985; 55: 139 – 146.
3. Mack PJ. Maxillary arch and central incisor dimensions in Nigerian and British population sample. Journal of Dentistry 1981; 9: 67 – 70.
4. Dunn LC and Dobzhansky T. Heredity , race and society. New American Library 1963; p. 109.
5. Moss ML, Chase PS and Flower RI. Jr Comparative odontometry of the permanent post-canine dentition of American whites and Negroes Am. J. Phy. Anropol. 1967; 27: 125 – 142.
6. Bishara SF, Jacobsen JR, Abdallah EM and Gracia AF. Comparison of mesico-distal and bucco-lingual crown dimensions of the permanent teeth in three populations from Egypt, Mexico, and the United States. American Journal of Orthodontics and Dentofacial Orthopedics 1985; 96: 416 – 422.
7. Ghoose LN and Baghdaday US. Analysis of the dentition mesio-distal crown dimension of permanent teeth. Journal of Dental research 1979; 58: 1047 – 1054.
8. Otuyemi OO and Noar JH. A comparison of crown size dimension of permanent teeth in a Nigerian and British population. Eu. J of orthodontics 1996; 18: 623 – 628.