J. Expt. & Clin. Anat. 4(2): 13-15 (2005).

Width To Length Ratio Of Dry Adult Indigenous Nigerian Mandibles

G. S. OLADIPO

Department of Anatomy, College of Health Sciences, University of Port Harcourt

Correspondence: PMB 5323, Port Harcourt, Rivers State. Email: oladipogabriel@yahoo.com

ABSTRACT

This study was carried out to provide a data on the width, length and width to length ratio of Nigerian mandibles, which could be useful for anthropological and clinical purposes. It was a cross sectional anatomical study. Thirty dry adult Nigerian mandibles selected from bone collection of Anatomy Departments of some Nigerian universities were used. The length and width of the mandible were measured across the mental foramen using digital venier caliper and the width to length ration caliper and the width to length ratio calculated. The following were observed: the mean length for the right and left sides of the mandibles studied were 9.74 cm and 9.99cm respectively. The mean width for the right and left sides were 3.02cm and 2.97cm respectively while the width to length ratio for the right and left sides were 0.310 and 0.297 respectively. The difference observed between the right and left sides was not statistically significant ($P > 0.001$). The width on the right and left sides of Nigerian mandibles were approximately 13% respectively of the length of the mandible. These values are similar to some African populations but differ from other groups, most especially the Caucasians. The result of this study are reliable in anthropological study and clinical practice (Dentistry).

KEYWORDS: Width, Length, Mandibles, Nigerians.

The mandible, the largest, strongest and lowest bone in the face, has a horizontally curved body, convex forwards, and two broad rami, ascending posteriorly (Williams et al, 1995). The mandibular body, some what U-shaped, has external and internal surfaces, separated by upper and lower borders. Anteriorly, the upper external surface shows a faint media ridge, indicating fusion of the halves of the second premolar, is the mental foramen for the passage of mental nerve and vessels (Warwick, 1950).

Several studies have been carried out on mandibular variants in different races. These include: Variable position of mental foramen (Tebo and Telford, 1950; Zivanovic, 1970; Nicholson, 1985; Nwaniki, 1992; Mbajiorgu et al, 1998, Oladipo and Fawehinmi, 2004), accessory foramina (Sutton, 1974; Gershenson et al, 1986), mandibular canals (Fawcett 1895; Carter & Keen 1971), Shapes of Lingula (Didia et al, 2004) and width and length of mandible (Mbajiorgu et al, 1998).

Although, reports are available on position of mental foramen in dry adult Nigerian mandibles, shapes of lingulae in dry adult indigenous Nigerian mandibles, however few reports exist on other races and no comprehensive report exists on the length, width and width to length ratio of dry adult indigenous Nigerian mandibles. This study was therefore aimed at providing a reliable data on the subject for Nigerians which could be useful for anthropological and clinical purposes, particularly for dental practitioners.

MATERIALS AND METHODS

The mandibles used for this study were selected from the bone collections of Departments of Anatomy, University of Ibadan, University of Lagos, University of Ilorin, Obafemi Awolowo University (OAU), Ladoke Akintola University, and University of Port Harcourt. It was a collection from many universities because of the difficulty of getting many mandibles in one institution. Thirty dry adult Nigerian mandibles with intact teeth or intact alveolar margin (in cases of lost teeth) were selected.

No distinction was made between male and female mandibles. The vertical distance CD between the alveolar margin and the lower border of the mandible across the mental foramen (width) and the horizontal distance AB between the mental symphysis (most prominent part) and the posterior border of the mandible across the mental foramen (length) were measured with the aid of a digital venier caliper

with a measuring accuracy of 0.01cm (see figure 1).

The measurements were carried out as follows: a uniform flexible wire was placed and stretched on the mandibular body between the two points to be measured (Mbajiorgu et al, 1998). The wire was then transferred to a laboratory table top and the digital venier caliper used to measure between the marked points. All measurement were carried out by the same author and repeated to minimize error of bias and identification of the parts of the mandibles.

Descriptive statistics and the students' t-test were used to analyze the data collected.

RESULTS

The results in Table 1 showed that the mean length for the right and left sides of the Nigerian mandibles studied were 9.74 cm and 9.99cm respectively. The mean width for the right and left sides were 3.02cm and 2.97cm respectively while the width to length ratio for the right and left sides were 0.310 and 0.297 respectively. The differences observed in the mean length, width and width to length ratio between the right and the left sides were however not statistically significant at any level of significance ($P > 0.001$).

Table 1: Summary Of Mandibular Length (AB), Width (CD) And Width To Length Ratio (CD/AB).

Parameters	AB (cm)		CD (cm)		CD/AB	
	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT
Mean	9.74	9.99	3.02	2.97	0.310	0.297
S.D.	2.399	1.711	0.445	0.430	0.185	0.251
S.E.	0.438	0.988	0.257	0.248	0.107	0.145
n	30	30	30	30	30	30

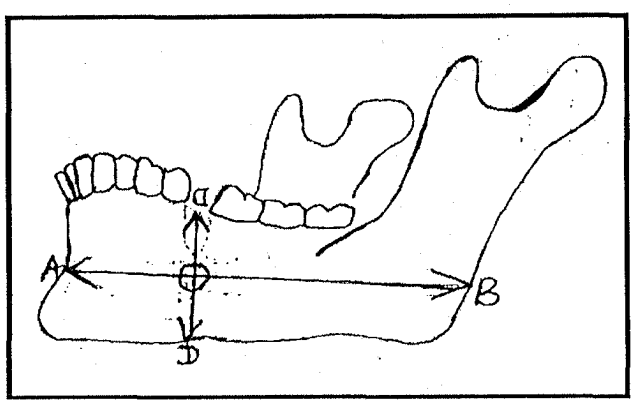

Figure 1: Scheme to show mandible with distance AB (length) and distance CD (width) across the mental foramen.

DISCUSSION

A number of reports by some authors have shown that the Chinese (Wange et al, 1986) and Indians (Gershenson et al, 1986) have slightly narrower mandible than Africans (Mbajiorgu et al, 1998). Mbajiorgu et al, 1998 reported that the mandibular length for the right and left sides for Black Zimbabweans were 9.94cm respectively. The width to length ratio for the right and left sides of Zimbabwean mandibles were 0.283 and 0.278 respectively. The above values are comparable to Nigerians. The differences are not significant. However, the values for Nigerians are higher than those reported by Gershenson et al, 1986 and Wang et al 1986. The reasons for these differences are thought to be due to difference dietary habits of the populations as well as racial and genetic factors (Mbajiorgu et al, 1998; Lang, 1977).

In the present study, the mandibular width on the right side of the mandibles was about 31% of the length of the mandible on the right side while on the left side it was approximately 30% of the length. The length on both sides are approximately the same likewise the width on both sides have approximately the same dimension among Nigerians.

CONCLUSION

The various measurements and ratio used in this study are precise and accurate. Thus the results are reliable in anthropological study and clinical practice (Dentistry).

ACKNOWLEDGEMENTS

The author is grateful to the Department Heads of the institutions that provided the mandibles for this study.

REFERENCES

Carter R.B., Keen E.N. 1971. The Intramandibular course of the inferior alveolar nerve. J. Anat. **108**: 433-440.

B.C. Didia, Oladipo, Nwajagu 2004. Shapes of the Lingulae in dry adult indigenous Nigerian mandibles. Nigerian journal of orthopaedics and trauma **2**: 128-133.

Fawcett E. 1895. The Structure of the inferior maxilla with special reference to the position of the inferior dental canal. J. Anat. **29**: 355 -366.

Gershenson A. Nathan H., Luchansky E. 1986. Mental foramen and mental nerve: changes with age. Acta Anat. **126**: 21-28.

Lang. J. 1977. Structure and postnatal organization of heretofore univestigated and infrequent ossifications of the sella turcica region. Acta Anat. **99**: 121-130.

EF Mbajiorgu, G. Mawera, S.A. Asala, S. Zivanovic 1998. Position of the mental foramen in adult Black Zimbabwean

mandibles: A Clinical Anatomy Study. The Central African Journal of Medicine **2:** 24-30.

Mwaniki DL, Hassanali J. 1992. The position of mandibular and mental foramen in Kenyan African mandibles. East in Med J **69**: 210-213.

Nicholson Ml. 1985. A study of mandibular foramen in the adult human, mandible. Anat. Rec **121**: 110.

Oladipo G.S and Fawehinmi H.B. 2004. The Position of Mental Foramen in Adult Nigerian Mandibles. Journal of Scientific and Industrial Studies **2:** 75-79.

Sutton R.N. 1994. The Practical Significance of Mandibular Accessory Foramina. Aust Ent Journal **19**: 167-173.

Teboma, Telford I.R. 1950. An Analysis of the variation in position of the mental foramen. Anat. Rec. **107**: 61-66.

Wang TM, Shilic, Liu Jc, Kuo KJ 1986. A Clinical and Anatomy Study of the location of the mental foramen in Adult Chinese Mandibles. Acta Anat **126**: 29-33.

Warwick R. 1960. The relation of the direction of the mental foramen to the growth of the mandible. J Anat. **84**: 116-120.

Williams P.L, Bennister LH, Berry MM, Collins P, Dyson M, Dussek JE, Forguson MWJ, Gray's Anatomy 38th edition, Edinburgh: Churchill Livingston, 1995: 576.

Zivanovic S. 1970. Some Morphological Characteristics of the East African mandibles. Acta Anat. 77: 109.