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Metric Dimensions of the Glenoid Fossa in Urhobo's of South Southern Nigeria

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ABSTRACT

This study was aimed at determining the dimensions of the glenoid fossa of the scapula in south southern Nigerians and to compare the findings with those of other populations. This study involved 48 scapulae (24 right and 24 left) obtained from the Delta State University, College of health Sciences, Anatomy department.Results of this study showed that the mean maximum length of the glenoid fossa was 2.43±0.10cm (left) and 3.47 ±0.21cm(right) while the breadth was 2.43±0.09cm (left) and 2.45±0.10cm (right). There was no significant difference between the lengths of left and right sides and the breadth of the right and left sides of both scapulae at 0.05 levels of significance. The difference between the breadth and length of their scapulae of either side was however significant ($p < 0.05$). A difference between the glenoid cavity dimensions of Nigerians and those of Americans, Guatemalans and Germans was observed. The glenoid cavity of the scapula has been known to exhibit sexual dimorphism which is of significant import in forensic studies. More importantly is its usefulness in demonstrating bilateral symmetry and in differentiating population types as was observed in this study.

Key words; scapular, glenoid cavity, sex, population, Nigerians

The scapula is a large triangular bone which lies on the posterior aspect of the chest wall overlying the second to seventh ribs in adult humans. The lateral border is truncated and bears the glenoid cavity for articulation with the head of the humerus facilitating movement of the upper limbs (Williams *et al* 1995; Frutos 2002).

The usefulness of the scapula in metric measurements is very important because of the decomposition resistant quality of this bone (Frutos, 2002). Several studies had shown that the glenoid cavity measurements were useful in differentiating populations and exhibited strong sexual dimorphism than other aspects of the scapula (Di Viella et. al., 1994). The objective of this study therefore was to determine the dimensions of the glenoid cavity of the scapula amongst Urhobo's , a tribe in south southern Nigeria and to compare the findings with those of other populations.

Materials and method

The study involved 48 well preserved scapulae obtained from the osteology museum of Delta State University Anatomy department. All specimen were of male origin (24 right and 24 left) and of indigenous south southern Nigerian adults whose ages were 25 years and above (since all ossification sites had fused) (William *et al* 1995). Measurements taken included length of glenoid cavity, (maximum distance across the glenoid cavity perpendicular to the anterior posterior axis) and breadth of the glenoid cavity (maximum distance across the glenoid parallel to the anterior posterior axis). Each measurement was taken twice with a digital calliper by two different observers. The means obtained from this study were then compared with those from some previous studies (Cormick et al 1991; Di Viella et al 1994) on glenoid cavity dimensions. Permission for this study was obtained from the research and ethics committee of Anatomy department, Delta State University (number DELSU/BMS/ANA/ERC/019).

RESULTS

Results of this study showed that the length of the glenoid fossa was 3.40±0.10cm (left) and 3.47 ± 0.21 cm (right) table 1. The average maximum length (for both right and left glenoid fossae) was 3.44 cm while the maximum breadth (for both right and left glenoid fossae) was 2.44cm. There was no significant difference between the maximum lengths of the left and right sides and the maximum breadths of the right and left sides of both scapulae at 0.05 levels of significance. The difference between the breadth and length of the scapulae of either side was however significant ($p < 0.05$).The results of obtained in this study were however similar to

Scapulae dimensions (table 1)

	Left		Right	
	Length (cm)	**Breadth (cm)**	**Length (cm)**	**Breadth (cm)**
Means	3.40 ± 0.10	2.43 ± 0.09	3.47 ± 0.21	2.45 ± 0.10

A comparison of scapula dimensions between the study population and other studies of some other countries (table 2)

Country	Length	Breadth
North Americans	4.20	3.50
Guatemalans	4.10	3.40
Germans	4.00	3.40
Asians	3.50	2.80
Malawians	3.77	2.58
Nigerians	3.44	2.44

*All samples were of male gender

measurements obtained from Asians and Malawians unlike the observation amongst Americans, Guatamalians and Germans (table 2).

DISCUSSION

This study has evaluated the dimensions of the scapula using the maximum length and maximum breadth of the glenoid cavity in South Southern Nigerians. The results of this study have shown a relatively smaller sized glenoid cavity compared to findings from Europe, North and Southern America and this may not be unconnected with the differences in geographic and environmental conditions which the individuals were exposed to (Bogin 1999). The findings could also be explained by the similar nutritional disposition of studied populations with Asians (Iscan *et al*1998) who had similar measurements as the population studied. The foregoing observations further underscores the need for population specific standards for metric categorisation of different populations owing to the different environmental, geographic, nutritional and health conditions (King *et al* 1998; Iscan *et al*1998).

The glenoid cavity dimensions were also shown to exhibit strong bilateral symmetry as both sides were clearly differentiated from the other. The possible explanation for this finding could be hand dominance (Christine et al 2006) (right hand prevalent in the study population) and by extension associated hypertrophy of the complementary muscle and bones.

CONCLUSIONS

The usefulness of the glenoid fossa of the scapula in demonstrating bilateral symmetry and in differentiating population types has been elucidated in this study.

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