The Prevalence of the Absence of the Occipital (Posterior) Horns of the Lateral Ventricles among Nigerians (2003 – 2008) using Computerised Tomography

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ABSTRACT

This study undertakes a five-year retrospective study on the prevalence of absence of occipital horns among Nigerians. All available brain CT scans of subjects done in the Radiology Department of the Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, Nigeria, from 2003 - 2008 (a 5-year period) and reported as normal by the Radiologist, were recruited for the study. The study reveals amidst others that occipital horns were absent in 33.6% images of the subjects reviewed in the study. Bilateral absence occurs in 21.7% of the subjects; of this 15.8% were males while 5.9% were females. Right occipital horn was absent in 5.3% of males and 1.31% of females, whereas, left occipital horn was absent in 1.3% of males and 5.9% of females. Unilateral absence occurs more on the right side of the subjects than on the left side. It is therefore concluded that the prevalence of the absence of the occipital (posterior) horns of the lateral ventricles is statistically significant.

Keywords: *Prevalence, occipital horn, absence, among, Nigerians*

INTRODUCTION

There is usually asymmetry between the two posterior horns and one or both may be absent but, when present they are usually of diamond-shape or square in outline (Keith-Moore and Persaud, 2005). Occipital (posterior) horn, which is quite variable in size, often asymmetrical on the two sides and one or both may be absent (Keith-Moore and Persaud, 2005). Acording to Taveras and Wood (1976), the contours of the lateral ventricles are relatively constant, except for the occipital horn which may show asymmetry and unilateral or bilateral absence. Le may (1984) in his study report the prevalence of the absence of occipital horn to be 23.5%; bilateral absence was 12.4%, unilateral absence occured more on the right side than on the left side with 9.3% and 7.2% absence on the right and left respectively. According to Schochet (1998) the brain undergoes many histopathological changes with advancing age and in various dementia. According to Fox, Gwalar and Topel (1975), Huckman, Fox and Topel (1975), Roberts and Caird (1976), Lemay (1984) and Lee and Krishna (1987), modern computerized tomography allows easy and safe noninvasive study of the ventricular system, without complications. The aim of this study is to undertake a study on the prevalence of the absence of occipital horns among Nigerians.

MATERIALS AND METHOD

Selection of materials: All available brain CT scans of subjects done in the Radiology Department of the Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, from 2003 - 2008 (a 5-year period) and reported as normal by the Radiologist, were recruited for the study.

Inclusion Selection Criteria: Selection of the Brain CT scan for the study was based on the following:

(a) Perfect positioning of the patient. With the Passage of the lowest tomographic section through a line 15–20 degrees to and 1cm above the cantho-meatal line which represent the base of the skull.

(b) Distinct interventricular foramen with clear anterior limit of the anterior horn and the choroid plexus in the occipital horn.

Exclusion Selection Criteria

(a) All brain CT Scans showing pathological changes affecting the normal anatomy of the lateral ventricles, were excluded.

(b) All films that showed alteration of the ventricular size, shape or asymmetry of the ventricles by the pathological condition.

(c) All brain CT scans with poor positioning of the patients.

(d) All brain CT scans with poor quality of the scan images.

Sample size was determined using the formular (Oyejide, 1991):

$$n = \frac{(Z)^2 \times Pq}{d^2}$$

Where n = minimum sample size,

Z = standard deviation from normal or confidence interval limit at 95% and is usually equal to 1.96,

p= prevalence or incidence rate in previous studies,

q= (1-p) and d= precision, that is the difference between the true population rate and the sample size which is 5%. Values were substituted using the least prevalence of 7.2% for absence of left posterior horn as follows:

$$n = \frac{(1.96)^2 \times 0.072(1-0.072)}{(0.05)^2} = 103$$

That is to say 103 is the lowest number of the CT scan images of subjects that can allow meaningful statistical analysis. All the CT scans were ascertained to have been taken by a trained and experienced radiographer, in a standardized condition and manner. The patients were placed on the CT table and the head was centralized and supported for correct alignment with head pads thus reducing blurring of images. A cantho-meatal line was drawn at an angle of 15-20 degree to and 1cm above it, representing the lowest tomographic section which passed through the base of the skull.

Brain CT scans studied were of good quality and clearly showed the anatomical features of the anterior horn and posterior horn of the lateral ventricles. Only radiographs interpreted by experienced radiologists were studied. Thus, the CT scans for measurement selected on the basis of good positioning patient not moving and having no visible evidence of pathology, which may affect the normal anatomy of lateral ventricles.

Cephalometric technique: Brain CT Scans were obtained from the local data base of the CT machine and back up compact disc from the CT library. Films were viewed on the computer monitor. Good positioning to determine symmetry or asymmetry of the ventricles is ascertained. Presence or absence of pathology was noted. Slide sections are examine from the lowest section which is represented by a line drawn at an angle of 15-20 degree to and 1 cm above it, which passed through the base of the skull, to interventricular foramen (foramen of Monro). Presence or absence of right, left, or both right and left occipital horns were noted.

Equipment Used in taking the Brain CT Scans used in the study include NEUSOFT C 3000 Spiral CT machine, and Dual Slide Helical CT (2005) model. Data were initially sorted out, tabulated and then entered into computer using Microsoft word and Microsoft Excel manually. Minitab 13.32 statistical package was used for data analysis. Statistical tests were employed for data analysis. Comparison of mean values was done using Students t-test, and proportions were compared using chi-square test.

RESULTS AND DISCUSSI0N

The occipital horns were absent in 51 images of the subjects reviewed in the study, which represent 33.6% of the subject. Bilateral absence occurs in 33 (21.7%) of the subjects, of this 24 (15.8%) were males and 9 (5.9%) were females. Right occipital horn was absent in (5.3%) of males and (1.31%) of females, whereas, left occipital horn was absent (1.3%) in males and (5.9%) in females. Unilateral absence occurs more on the right side 10 (6.6%) of the subjects than on the left side 8 (5.3%) of the subjects. Therefore the prevalence of the absence of the occipital (posterior) horns of the lateral ventricles is statistically significant ($p < 0.05$).

The current study assessed the prevalence of the absence of occipital horns of the lateral ventricles among Nigerians. The absence of the occipital horn was noticed to be a frequent occurrence in this study, with bilateral absence occurring more frequently than unilateral absence. Right occipital horn absence was observed to be commoner in males, while left occipital horn was noticed to be commonly absent among female subjects in this study. Le may (1984) in his study on the Caucasians reports similar observation although his values were less than what we observed in this study. Moore and Persaud (2005) and Williams *et al* (1999) document bilateral or unilateral absence of the occipital horns of the lateral ventricles among Indians and Caucasians respectively. The reason why the occipital horn is commonly absent is yet to be established.

Table 1: Prevalence of the absence of the occipital (posterior) horns of the lateral ventricles among the subject in the study

Type of horn absent	**Frequency**	**Percentage**
Right posterior horn	10	6.6%
Left posterior horn	10	5.3%
Both posterior horns	33	21.7%
Total	**51**	**33.6%**

N= 152; X^2= 67.1; df = 2; p < 0.05

Source: *Retrospective study 2003 - 2008*

Since p < 0.05, therefore, the prevalence of the absence of the occipital (posterior) horns in the subjects is statistically significant.

Table 2: Prevalence of the absence of the occipital (posterior) horns of the lateral ventricles in relation to sex of the subjects

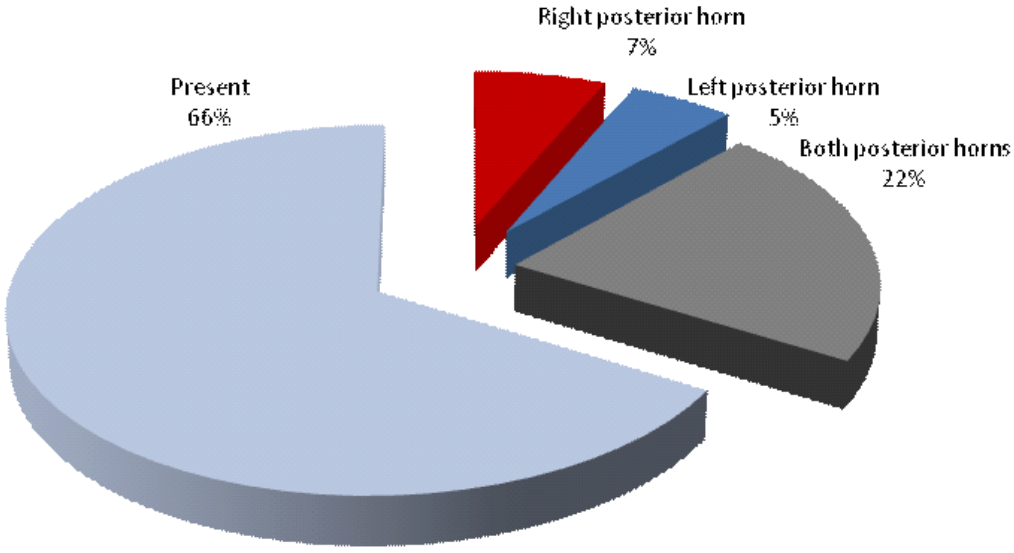
Type of horn absent	**Frequency**		
	Male =100 (%)	**Female =52 (%)**	**Total**
Right posterior horn	8(5.3)	2(1.31)	10
Left posterior horn	2(1.3)	6(3.9)	8
Both right and left posterior horn	24(15.8)	9(5.9)	33
Total	**34**	**17**	**51**

X^2 = 206.2; df =4; p < 0.05

Source: *Retrospective study 2003 - 2008*

Since p < 0.05, therefore, the prevalence of the absence of the occipital (posterior) horns in the subjects is statistically significant for both sexes.

Fig. 1: Prevalence of the absence of the occipital (posterior) horns of the lateral ventricles among the subject in the study.



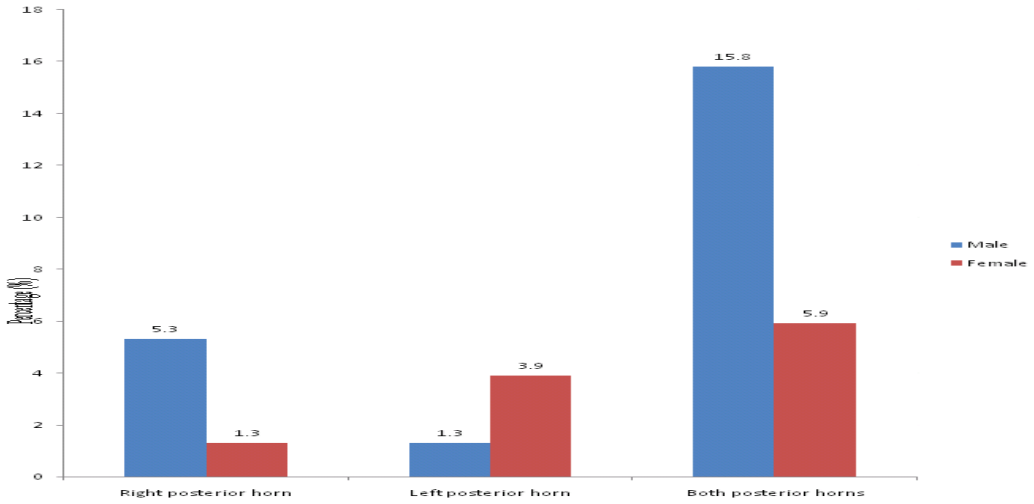


Fig 2: Prevalence of the absence of the occipital (posterior) horns of the lateral ventricles in relation to sex of the subjects

CONCLUSION

This is a five-year retrospective study on the prevalence of absence of occipital horns among Nigerians. All available brain CT scans of subjects done in the Radiology Department of the Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, Nigeria, from 2003 - 2008 (a 5-year period) and reported as normal by the Radiologist, were recruited for the study. This study conclusively reports that occipital horns are commonly absent among Nigerians and this occurs more on males than females, on the right than the left and bilaterally than unilaterally.

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