

CRANIAL COMPUTERIZED TOMOGRAPHY IN THE EVALUATION OF STROKE PATIENTS IN IBADAN.

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ABSTRACT

206 patients clinically diagnosed as stroke/cerebrovascular accidents(CVA) were investigated using computerized tomography (CT) scan. 19 patients (9%) had normal scan, While 20(9.7%) patients had other lesions including atrophy and tumours. Of the 167(18.1%) patients proven to have suffered a cerebro-vascular accident (CVA/stroke), 73 (43.7%) were haemorrhagic, 92 (55.1%) were infarcts; and left side when it is haemorrhagic than infarct (16.7%:38.3). The parietal and frontal lobes were affected when lesions occur in single site while caudate nucleus, putamen and ventricles are commonly affected when lesion is in more than 2 sites. The occipital lobe i.e. posterior cerebral artery territory is infrequently involved.

KEYWORDS: Cranial, Computerized Tomography, Stroke.

INTRODUCTION

Stroke and other circulatory diseases are still a major cause of death in developing countries like Nigeria, even though the incidence is dropping in the developed countries^{2,4}. Classification of stroke in previous studies done here were based on clinical examination or by angiographic studies and these are not without their limitations and misdiagnosis^{4,6}. With aggressive and promising new therapies for treating stroke early recognition of ischaemic related diseases place the CT examination at the forefront of stroke management. CT has no doubt become an important tool in the investigation of CVA, where the cause of stroke must be established before instituting treatment. The latter depends on the differentiation of the various types of stroke. Previous studies have suggested infarction as the commonest type of stroke while a recent study from Accra Ghana^{3,7} suggested that haemorrhagic stroke was more common. We have therefore decided to pathologic types of stroke seen in Ibadan.

PATIENTS AND METHODS

The computed Tomographic Scans and reports of patients with diagnosis of stroke or CVA referred for scan between July 1991 and December 1999 were studied. CT films of the brain were reviewed for the type and the sites of lesion. The bio data of the patients were obtained from the request cards and case notes. The examination was carried out using a CE 9000 scanner employing a 520 x 520 matrix with a standard 13m collimator. All scans were done with the patient lying supine and axial images were obtained at 10mm intervals with 5mm slices in the posterior fossa where necessary. The CT scans were done without contrast enhancement in most cases.

RESULTS

A total of three thousand, five hundred and fifty nine patients were referred for CV brain examination within the study period and 206 patients were referred on account of stroke/CVA. There were 121 (58.7%) males and 95 (41.3%) females. Table I shows the CT findings. Nineteen (9.2%) show

No abnormality on the scan and 20 (9.7%) had other lesions including atrophy and tumours. Cerebral infarction fig. 1 was more common occurring in 92 patients (55.1%) while haemorrhagic bleed fig 11 and mixed lesion in 2 ranged from 5 years to 87 years with a mean of 52.8 years (SD.48). 167 patients had CT evidence of stroke/CVA. The peak incidence of stroke in this study is the 6th decade being common in the 5th and 7th decades also. Table 111 shows both lesions were commoner in males and occurred more on the left side, more significantly when it is haemorrhagic (Table IV). Both lesions are commoner on the left. Table V. shows the sites of the lesion with the lesion occurring mostly in parietal and frontal lobes.

DISCUSSION

Before CT, the diagnosis of CVA was suspected clinically and confirmed by CSF and angiographic findings. CT is now in the forefront of imaging modality of CVA or stroke because of its many advantages^{1,2,8,9} especially in Nigeria where new Nigeria where new imaging techniques are not available.

A major advantage is the ability to quickly differentiate haemorrhagic from infarctive lesion, a pre-requisite before therapy commences. Infarct is the commonest type of stroke in our study. This is in contrast to the study of Nyame⁶ amongst the blacks in the USA and urban Zimbabweans and in the urban South Africans. Our present study is however in consonance with that of Oshuntokun¹⁰, Dada⁸ and El Ssayed⁹. The differentiation of the type of stroke has management/therapeutic implications as the use of anticoagulants in unsuspected cerebral haemorrhage may worsen the case.

While infarct was seen to occur equally in both hemispheres, haemorrhagic lesion was significantly commoner on the left side, (61.7%: 38.3%). Confirming a left cerebral dominance. This was also the finding of Obajimi and others in a similar study in Ghana¹¹. The commonest sites were the parietal and the frontal lobes (Table V). This is also in consonance with the findings of other workers^{1,3,4,8,10} confirming that the territory of middle cerebral artery (MCA) is mostly involved. Our study also showed that when lesions occur in more than 2 sites, it is likely to be haemorrhagic as it then spreads into the ventricles and the thalamic areas.

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The overall frequency of non-stroke lesions in this study is 9.7%. This is similar to the findings of Ogun^{4,9} and others in another study. The incidence is however lower in a community based study^{1,2}.

The peak age incidence of CVA in our study is the 6th decade, when blood vessels are becoming atherosclerotic

Table I: CT Findings in the 206 Patients.

		%
Normal	19	9.2
Infarct	92	55
Haemo	73	43.7
Atrophy	17	8.3
Tumour	3	1.5
Mixed Lesion	2	1.2
Total	206	100

Table II: Age Distribution of patients with confirmed stroke on CT

Age	No	%
0-10	5	3
11-20	7	4.2
21-30	8	4.8
31-40	17	10.2
41-50	24	14.4
51-60	67	40.0
61-70	25	15.0
71-80	14	8.4
Total	167	100%

Table III: Type of Lesion based on sex

	Male	Female	
Infarct	92	55(32.9%)	37(22.1%)
Haemo	73	42(25.1%)	31(18.5%)
Mixed	3	2(1.1%)	1(0.6%)
Total	167	99(59%)	69(41%)

Table IV: Side of Lesion with Type

	LT	RT	Both	Total
Infarct	47	45	-	92
Haemo.	45	19	9	73
Mixed Lesion	1	-	1	2
Total	93(55.&%)	64 (38.3%)	10(6%)	167(100)

Table V: Sites of Lesion.

Site	Number
Parietal	107
Frontal	40
Occipital	3
Caudate	26
Thalamus	26
Ventricular	23
Temporal	16
Putamen	8
Sub-arachnoid	3
Sub-cortical	3
Cerebellar	2
Total	287*

*Some of the patients have multiple sites of lesion

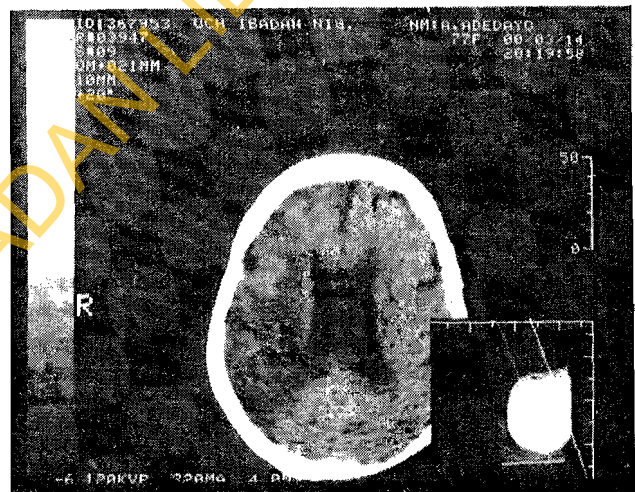


Fig. I: Unenhanced Ct of the Brain showing hypodence area of infarction in the right parietal region.

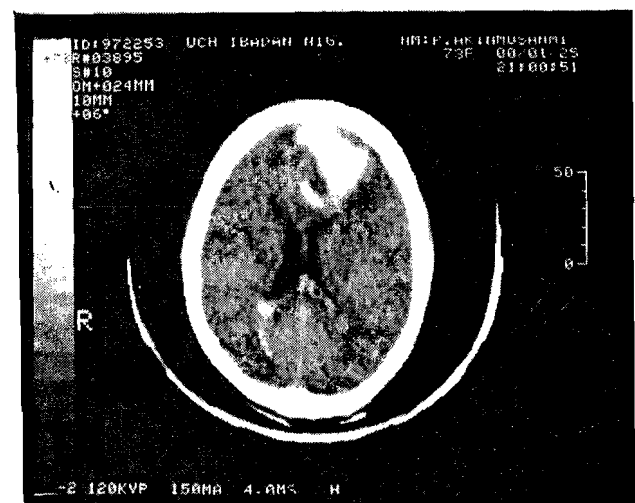


Fig. II: An unenhanced CT of the brain showing a hyperdense area of bleed in the left frontal lobe With associated intraventricular involvement.

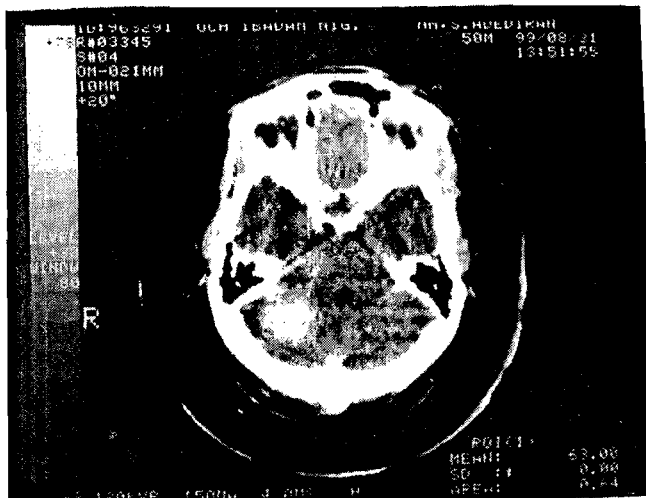


Fig. III: Unenhanced Ct of the brain showing a hyperdense area of bleed in the Right Cerebellum.

bearing in mind that risk factors including hypertension and diabetes are related to this age group. The higher incidence in male is also not surprising as they bear the brunt of Socio-economic stress from the family and work place. There was however no significant age difference between the peak incidence of haemorrhage or infarction (51.3 V 52.59 years). In a developing country like Nigeria, CT is relied upon in case of stroke to provide maximum information in the shortest possible time, although clinical appraisal might be faster and cost effective as suggested by Weir et al³, and Peungvanna et al⁴, but as shown by Norris⁵, accuracy of clinical diagnosis is heavily dependent on the experience of the attending physician. MRI, which is much more sensitive and very expensive is not readily available in the country, so CT is the mainstay of investigating a patient with stroke. The accuracy reached by Sandercock et al² in the evaluation of CT scan in patients with stroke, which portrays clinical assessment as cost effective, can not be attained in the developing world in routine clinical practice. Many more disorders other than stroke or the identification of surgically treatable cause of stroke are likely to be missed if only clinical examination is relied upon. Apart from classifying stroke, this study has also shown the commonest site of occurrence. Infarct is the commonest cause of stroke seen in our study, which accounted for 55% of the cases in contrast to the study done in Accra Ghana by Nyame et al⁶ among Ghanaians, and also among the blacks in the USA, the urban Zimbabweans and in the South Africans. However our study is in consonance with the study done by Osuntokun et al⁹, and that done by El sayed⁹. The differentiation of the types of stroke has management therapeutic implications for the patient. It is therefore important that a CT examination should be obtained before therapeutic management is commenced. It can be performed quickly and safely on critically ill patient and quickly differentiate haemorrhagic from infarctive lesion leading to the appropriate management.

The normal CT scans in some of our stroke patients is also not surprising, as the early changes in infarcts are subtle and may be missed in the acute phase and small lacunas occurring in the posterior fossa may also be missed. Patients with clinical signs of stroke and negative CT can be investigated with newer imaging modalities like MRI.

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