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CT FINDINGS IN HEAD SCANS AT MOI TEACHING AND REFERRAL HOSPITAL
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ABSTRACT

Background: **The first CT scanner in western Kenya was launched on 20th February, 1998.**
Objective: **To determine the pattern of CT findings in head scans.**
Design: **Prospective study over a one year period.**
Setting: **Moi Teaching and Referral Hospital, Eldoret, Kenya.**
Subjects: **Four hundred and ninety five consecutive patients who underwent CT head scans.**
Results: **Intracranial haemorrhage was the leading disorder with 17.8%, followed by brain infarcts at 10.5%, hydrocephalus at 6.3% and brain tumours at 5.9%.**
Conclusion: **Intracranial disorders secondary to trauma, stroke and their sequelae are major causes of head disease in western Kenya.**

INTRODUCTION

Computerised tomography (CT) has been available since 1973 and has changed neurological, neuro-surgical and radiological practice tremendously(1). CT is non-invasive and is a useful radiological aid for the evaluation of cranial and maxillo-facial lesions(2,3) and indeed other regions of the body.

CT scanning should be available as the initial neuro-radiological examination whenever possible because of its value, efficacy and high diagnostic index(4-6). Where CT and magnetic resonance imaging, MRI), are available they are now the imaging modalities of choice for the investigation of most neurological lesions(7).

CT scanning was launched in Moi Teaching and Referral Hospital on 20th February, 1998. Head and body scans have been ongoing since then. The impact CT scanning is having in western Kenya region is gradually unfolding.

The objective of this study was to determine: (i) the value of CT of the head and, (ii) the radiological pattern of head disease.

MATERIALS AND METHODS

A prospective study was done over a one year period between 20th February, 1998 and 20th February, 1999. A total of 564 consecutive patients who underwent CT scanning, were included in the study. The patients' bio-data, clinical findings and radiological findings were recorded and later analysed using the SPSS/PC+ programme(8).

A Phillips CT scanner model CX - Q, which has head and body scanning capability was used. Non-contrast and contrast – enhanced techniques were used depending on the indications and preliminary CT findings.

The results of CT findings were as shown in Tables 1-4. Head scans accounted for 87.8% of all CT scans done at our institution (Table 2). Intracranial haemorrhage, brain infarct and hydrocephalus were the leading causes of morbidity accounting for 17.8%, 10.5% and 7.9% respectively (Table 4). Most of the intracranial haemorrhage was caused by trauma and cerebro-vascular accidents. Stroke and its sequelae was a significant player in the said three leading intracranial disorders.

Table 1

Head and body CT scans

Year	Month	Frequency	Percentage
1998	February	6	1.1
	March	53	9.4
	April	37	6.6
	May	50	8.9
	June	48	8.5
	July	44	7.8
	August	41	7.3
	September	43	7.6
	October	41	7.3
	November	46	8.1
	December	63	11.2
1999	January	54	9.5
	February	38	6.7
Total	12	564	100

Table 2

Region of CT scan

Region	Frequency	%
Head	495	87.8
Spine	18	3.2
Chest	15	2.6
Abdomen	32	5.7
Neck	4	0.7
Total	564	100

Table 3

Head scans

Year	Month	Frequency	%
1998	February	5	1.0
	March	48	9.7
	April	36	7.3
	May	45	9.1
	June	42	8.5
	July	41	8.3
	August	31	6.3
	September	37	7.5
	October	31	6.3
	November	40	8.0
	December	55	11.0
1999	January	50	10.1
	February	34	6.9
Total	12	495	100

Table 4

Head CT scan findings

CT finding	Frequency	%
Normal	174	35.1
Intracranial haemorrhage	88	17.8
Brain infarct	52	10.5
Hydrocephalus	39	7.9
Brain atrophy	31	6.3
Brain tumours	29	5.9
Skull fracture	17	3.4
Cerebral abscess	14	2.8
Sinusitis	8	1.6
Maxillary antral tumours	5	1.0
Others	38	7.7
Total	495	100

RESULTS

The CT findings were tabulated in Tables 1-4.

Head scans accounted for 87.8% of all CT scans done at our institution (Table 2). Intracranial haemorrhage, brain infarct and hydrocephalus were the leading causes of morbidity accounting for 17.8%, 10.5% and 7.9% respectively (Table 4).

Most of the intracranial haemorrhage was caused by trauma and cerebro-vascular accidents. Strokes and its sequelae was a significant player in the said three leading intracranial disorders.

Intracranial haemorrhage was constituted of brain haemorrhage (10.7%) and subdural haematoma (7.1%), that is to say, subdural haematoma formed 40% of all intracranial haemorrhages. The commonest presenting complaints were trauma (33.6%), convulsions (17.9%), hemiparesis (14.3%), headache (11.4%) and hemiplegia (6.5%). Space occupying lesion (27.7%), head injury (18.9%), subdural haematoma (4.7%) and, stroke (7.8%) were the most common clinical diagnoses.

DISCUSSION

CT scanning is a useful investigative tool for correct diagnosis and rapid treatment of head injury and helps to reduce the mortality rate and economic costs to the state and patient,(9-11). Complex maxillofacial trauma with multiple injuries can be accurately diagnosed by CT(12). In addition CT allows, evaluation of associated brain pathology(13).

In investigations of congenital anomalies, arteriovenous malformations, bone lesions, tumours of the orbit, CT has proved itself to be of considerable value(14).

Contrast medium given intravenously as a bolus is at times indicated in head scans. The characteristic ring enhancement of the brain lesions is seen in cerebral abscesses. Gliomas show enhancement but uniformly throughout the lesion. Enhancement of brain lesions is a result of disruption of the blood brain barrier. Non-ionic contrast media which are less toxic than ionic media are recommended in brain CT(15). CT scan guided biopsies are a safe and accurate way to obtain brain tissue specimens for pathological diagnosis in selected cases(16).

Assault and motor vehicle accidents were the major causes of head trauma. Plain skull radiographs may show fractures but cannot reveal the state of the brain tissue in acute head injury(20,18). For this reason CT is the imaging modality of choice(17-19).

CT scanning will demonstrate and delineate accurately intracerebral bleeding, intraventricular bleed, subarachnoid bleed, sub-dural haematoma (acute, sub-acute and chronic) and epidural haematomas(20-22). CT aims to localise and delineate the lesion in order to direct specific diagnostic and therapeutic options(23).

CT is superior to angiography in diagnosing haematoma and in determining its extent and associated ventricular size. Angiography is superior in demonstrating aneurysms and arteriovenous malformations as a cause of intra-cerebral haematoma. CT is

useful in following the resolution of haematomas and in guiding surgical intervention(24). The sum of information from the combined cerebral angiograms and brain CT scans studies exceeds that from either study alone and has value for both diagnosis and treatment of head lesions(25).

Space occupying lesions intracranially may be caused by gliomas, meningiomas, abscesses, pituitary tumours, cysticercosis, hydrocephalus, haematomas(26,11).

CT scanning provides more accurate diagnosis and localisation of abscesses and other space occupying lesions. In abscesses, CT aids in the rapid detection of post-operative complications. Serial CT studies therefore provide a means to optimise the timing for surgical intervention and plan appropriate medical therapy (27,28).

In conclusion, CT scanning is having a major impact on the diagnosis and therapeutic aspects of intracranial disorders management in our centre. It is fast, accurate, efficient and reliable. Western Kenya has a lot to gain from this imaging modality due to accessibility and decreased costs as compared to referral of patients to Nairobi.

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