CEREBRAL IMAGING USING GAMMA CAMERA: ANALYSIS OF 244 PATIENTS

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Abstract

Two hundred and forty four patients had brain scans. There were thirty five positive scans. Majority of the patients with positive scans had headache accompanied by other neurological features. Two out of fifty epileptics had positive scans.

Introduction

Organ visualisation studies or "scans" are safe procedures which cause neither patient discomfort nor morbidity. Since cerebral imaging has no side effects, it is frequently used to preselect patients for more taxing diagnostic procedures such as airstudies and cerebral arteriography. Gamma camera was installed in Peshawar in late 1975 and since that time two hundred and forty four patients have been studied by cerebral imaging. These patients were analysed from the view point of finding the type of patients referred, the number of positive scans and the final outcome of the patients who had positive and negative scans.

Patients and Methods

Majority of the patients were referred (Table I). The reasons for referral are given in Table II. Large field Toshiba gamma camera was used for cerebral imaging .Technetium 99m (10-12mci) was injected intravenously and pictures of the brain (anterior, posterior and both lateral views) were obtained one hour after the injection.

Table I: Referred Patients

Referring Clinician	*No. of Patients*	*Percentage*
Physicians	100	40.98%
Psychiatrists	27	11.06%
Paediatricians	21	8.60%
Radiotherapist	5	2.04%
Ophthalmologist	7	2.86%
E.N.T. Specialist	1	0.40%
General Practitioners	12	5.91%
Surgeons	3	1.22%
Unknown or not Properly Recorded	68	27.86%

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Table II: Reasons for Referral

Reasons for Referral	*No. of Patients*	*Percentage*
Epilepsy	50	20.49
Hemiplegia	23	9.42
Headache	65	26.63
Meningitis	3	1.22
Paraplegia	6	2.45
Ataxia	9	3.68
Miscellaneous Neurological and Psychological Disorders	46	18.85
Not Properly Recorded	42	17.21

Results

Sex and Age

There were 89 women and 155 men. The youngest patient was 9 months old and the oldest 85 years.

Presentation

There were 65 patients with headache accompanied by other neurological features. Fifty patients had epilepsy, 42 patients had their clinical features not properly recorded or their clinical record was lost. 46 patients had miscellaneous neurological or psychological disorders such as depression, dementia, hysteria, behavior changes without positive clinical findings. Twenty three were hemiplegics. Nine had ataxia, six were paraplegics and three had meningitis.

Positive Scans

The scans of 35 patients were positive (Table III). Sixteen had headache accompanied by other neurological features. Fifteen were hemiplegics, two were positive among epileptics and two among the patients with meningitis.

Table III: Positive Lesions

Lesion	*Clinical features*	*No.*
Cerebello Pontine Angle	Headache, vomiting, recurrent facial paralysis and dimness of vision	2
Cerebral Hemispheres	Hemiplegia	15
Frontal Lobe	Headache, loss of concentration, vomiting, visual disturbances, dementia.	3
Parietal Lobe	Headache, vomiting, difficulty is speech and visual disturbances	2
Temporal Lobe	Meningitis	2
Temproparietal Lobe	Loss of memory, giddiness, headache	2
Parietooccipital Lobe	Headache and depression	3
Eye	Headache and loss of vision	1
Abscess	Headache	1
Metastatic	Fever, headache and vomiting	2
Meningiomas (Near Saggital Sinus)	Epilepsy	2

Discussion

Cerebral imaging is a safe procedure and there were no untoward symptoms from the injection of radiopharmaceutical or the procedure itself in this series. Majority of the patients were referred by physicians and psychiatrists. There were only two positive cases among epileptics. The probability of detecting lesion in epileptics, especially in children is low, but the benefits in a few patients who have abnormal scans justify the widespread use of cerebral imaging in epileptics.

Hurley and Wagner (1972) analysed cerebral imaging in children from the viewpoint of the part it plays as a step in the diagnostic process, i.e. its effect in altering the prior probability of disease. A tumour beautifully demonstrated by scan could be clinically valueless because the tumour was already known to exist. On the other hand an accurate normal image in a child suspected of cerebral abscess could be of great value because of the known sensitivity of scanning in detecting this type of lesion. Therefore value is not synonymous with abnormality.

Among the twenty three hemiplegics, fifteen were positive out of which four were traumatic and the rest were vascular lesions. These were diagnosed by history, signs and the typical appearance of scans. Burrows (1972) obtained abnormal scans in 92 percent of patients with vascular lesions. Brain scanning in cerebral infarcts is of value in differential diagnosis, in dating a known infarct and in assessing progress and prognosis (Deland, 1971; Glasgow et al., 1965; Usher and Quinn, 1969).

One expects a detecting rate of 80 to 90 percent with intracranial tumours (Moreno and Deland, 1971; Burrows, 1972). In the present series sixteen were strongly suspected of tumour because of the clinical features; a known malignancy elsewhere and progressive illness leading to death. Neuroradiological and neurosurgical procedures are not available locally for confirmation.

One patient was strongly suspected of having cerebral abscess, but he has been lost to followup. Scans are virtually always abnormal in abscess, often becoming so before arteriography (Tefft et al., 1966; Jordan et al., 1972). Arteriography is 85 percent and ventriculography 73% accurate (Carey et al., 1972).

Eight hundred and fifty two patients were followed up by Gold and Loken (1969) and they found 0.5 percent false positive and three percent false negative rates. Figures for the present series could not be arrived at because of many reasons (non availability of accurate records, loss of patients for follow up by busy referring clinicians, drifting of patients from one doctor to another, lack of neurosurgical and neuroradiological facilities).

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