



ORIGINAL RESEARCH PAPER

paediatrics

STUDY OF NEUROIMAGING FINDINGS IN PAEDIATRIC EPILEPSY

KEY WORDS: Epilepsy, Neuroimaging, CT/MRI Brain, Ring enhancing lesions

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ABSTRACT

INTRODUCTION : Epilepsy is an important health problem in developing countries. The unpredictability of seizure recurrence is a constant threat to the patient with epilepsy and his or her family. The risk of premature death in people with epilepsy is two to three times higher than it is for the general population. Neuroimaging becomes important and mandatory in the work up of epilepsy and for localization and lateralization of the seizure focus.

AIM/OBJECTIVE:- To assess the number of children with epilepsy having neuroimaging abnormalities of the brain(CT/MRI). And To evaluate the spectrum of intracranial structural abnormalities in children with epilepsy as diagnosed by neuroimaging

MATERIAL & METHOD:- All children between age of 1 month to 18 years with two or more unprovoked seizures attending the paediatrics emergency and OPD of SAMC & PGI in 1½ year duration were enrolled in the study. Detailed history and clinical examination was done for all the patients included in the study. And neuroimaging(CT/MRI) was also done in all patients.

RESULT:- In our study, 98 out of 144 patients had some or the other abnormalities in their scans (ie.68.05%). and Ring enhancing lesions were found in 26.53% followed by gliotic changes in 18.36% and cerebral atrophy in 12.24%.

CONCLUSION:- The study shows that Neuroimaging is an important diagnostic tool in evaluation of children with epilepsy.

INTRODUCTION

In developing countries epilepsy is a major and important health problem. The international classification of epileptic seizures and epileptic syndromes 1985/1989⁽¹⁾ has defined epileptic syndrome as an epileptic disorder characterized by a cluster of signs and symptoms customarily occurring together. The factors used to define syndromes were clinical such as case history, seizure type, modes of seizure occurrence, neurological findings, psychological findings, and findings detected by ancillary studies (CT scan and MRI). The unpredictability of seizure recurrence is a constant threat to the patient with epilepsy and his or her family. Epilepsy is a complex neurological condition with many possible comorbid features.⁽²⁾ In developed countries, annual new cases are between 40 to 70 per 100000 people in the general population and in developing countries, this figure is often close to twice. Close to 80% of epilepsy cases worldwide are found in developing regions. The risk of premature death in people with epilepsy is two to three times higher than it is for the general population.⁽³⁾ The principal clinical applications of MRI are to identify the structural basis of epilepsy and patients who are suitable for surgical treatment. Neuroimaging becomes important and mandatory in the work up for epilepsy in localisation and lateralisation of the seizure focus.⁽⁴⁾

AIM & OBJECTIVE

To assess the number of children with epilepsy having neuroimaging abnormalities of the brain(CT/MRI).

To evaluate the spectrum of intracranial structural abnormalities in children with epilepsy as diagnosed by neuroimaging.

MATERIAL & METHOD

The study was a prospective observation study approved by the ethical committee of Sri Aurobindo medical college and Post graduate Institute, Indore (M.P.), and an informed written consent was obtained from parents of each patient. The present study was conducted in the Department of paediatrics. It was a 1½ year duration study in which 144 patients were taken for study and were selected from paediatrics OPD and emergency. Detailed history with

Complete neurological examination was carried out in all the patients. And Neuroimaging study was done in all patients.

Inclusion criteria:

Any child between age of 1 month-18 year with two or more unprovoked seizures and has undergone neuroimaging i.e. CT/MRI Brain.

Exclusion criteria:

- Children with
- 1. Febrile seizures.
- 2. Acute symptomatic seizures.
- 3. Progressive neurological disorders.
- 4. Who could not undergo neuroimaging.

RESULT

Table No. 1 Age / sex distribution of patients studied

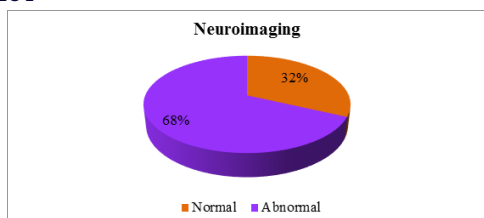
Age Group	Male	Female	Total No. of Patients
	No.	No.	
1 months – 3 years	28	8	36(25%)
4 years – 6 years	12	22	34(23.61%)
7 years – 9 years	18	14	32(22.22%)
10 years – 12 years	14	8	22(15.27%)
13 years -18 years	6	14	20(13.88%)
Total	78(54.16%)	66(45.83%)	144(100%)

A total of 144 cases aged between one month to eighteen years of both genders visiting OPD and emergency of paediatrics department were taken. The table-1 shows the age and sex distribution of the patients. Almost equal age distribution was there in the different age groups. In our study 54.16% of children were male and 45.83% were female.

Table No. 2 Neuroimaging

Neuroimaging	Total No. of Patients	Percentage
CT/MRI scan		
• Normal	46	31.94%
• Abnormal	98	68.05%
Total	144	100%

Figure 1



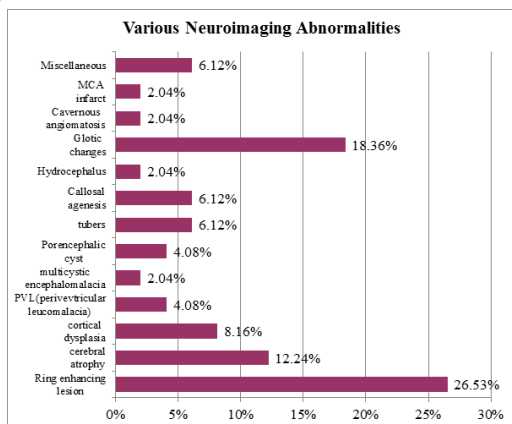
In the study population of 144, 98 patients had some or the other abnormalities in their scans. This shows that in 68.05% patients had an abnormal neuroimaging. (Table-2 & Figure 1)

Table No. 3 Various Neuroimaging Abnormalities

Various Neuroimaging Abnormalities	Total No. of Patients	Percentage
Ring enhancing lesion	26	26.53
Cerebral atrophy	12	12.24
Cortical dysplasia	8	8.16
PVL (Periventricular leucomalacia)	4	4.08
Multicystic encephalomalacia	2	2.04
Porencephalic cyst	4	4.08
Tubers	6	6.12
Callosal agenesis	6	6.12
Hydrocephalus	2	2.04
Gliotic changes	18	18.36
Cavernous angiomatosis	2	2.04
MCA infarct	2	2.04
Miscellaneous	6	6.12

In our study we found that out of 144 patients, Ring enhancing lesions were found in 26 patients (26.53%) followed by gliotic changes found in 18 patients (18.36%) and cerebral atrophy found in 12 patients (12.24%). (Table-3 & Figure 2)

Figure 2



DISCUSSION

This study was conducted in Department of paediatrics, SAIMS & PG Institute, Indore, (M.P.). A total of 144 subjects were included in the study.

In our study we found that Neuroimaging is an important diagnostic tool for paediatric epilepsy as it detects some lesion in 68.05% patients having epilepsy. In present study we found that out of 144, Ring enhancing lesions were found in 26 patients (26.53%) followed by gliotic changes found in 18 patients (18.36%) and cerebral atrophy found in 12 patients (12.24%) and 8 had cortical dysplasia(8.16%), 4 had periventricular leukomalacia(4.08%), another 4 had porencephalic cyst(4.08%), other abnormalities were cystic encephalomalacia in 2(2.04), hydrocephalus in 2(2.04), cavernous angiomatosis in 2(2.04), MCA infarct in 2 patient(2.04)

These abnormalities were grouped into following etiological factor :Perinatal insult (40.81%),Infective sequelae, mainly NCC (26.53%),Congenital/developmental (24.48%) and Vascular (2.04%).

In our study, Perinatal insult was found to be most common cause of epilepsy in children. Similar observation was made in some other studies done by Selina et al⁽⁶⁾ and Mohamed Y. et al^(6,7) In their studies they also found perinatal insult as most common cause of paediatric epilepsy. NCC was found as next common cause.

CONCLUSION

The purpose of the diagnostic evaluation in a patient with seizures is to provide evidence that helps confirm or refute the diagnosis of epilepsy and to identify the cause of epilepsy and/or to classify the epileptic syndrome. Worldwide epilepsy affects fifty million people. According to a WHO survey epilepsy accounts for one percent of the global burden of the disease.

It has been found that Perinatal insult followed by neurocysticercosis are the common causes of epilepsy in paediatric age group and Neuroimaging is an important diagnostic tool in evaluation of children with epilepsy.

From the above findings we conclude that neuroimaging study is an important diagnostic tool for paediatric epilepsy and helpful for classification of seizure type and syndrome. And this is helpful for starting a stepwise treatment strategy for childhood epilepsy. Neuroimaging also has a critical role in the evaluation of patients with refractory epilepsy for epilepsy surgery.

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