IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 12 Ser.7 (December. 2020), PP 35-43
www.iosrjournals.org

Computed Tomographic Evaluation of Patients with Seizure Disorder

Dr. Nisha Rai[1],Dr. IrfanAhmad[2], Dr. N.Haque[2],Dr. Dilip Kumar[3] Dr. Suresh Kumar Toppo[4]

Assistant Professor[1],Junior Resident[2],Ex-Professor And Head[3] Professor And Head[4,]
[1,4]department Of Radiology, Rajendra Institute Of Medical Sciences, Ranchi, Jharkhand-834009
[2,3]department Of Radiology, Darbhanga Medical College, Laheriasarai
Corrosponding Author- Dr. Nisha Rai

Abstract
Background- *Seizure is a paroxysmal event due to abnormal, excessive hypersynchronous discharge from an aggregate of CNS neurons. Depending on the distribution of discharge, this abnormal CNS activity can have various manifestations, ranging from dramatic convulsive activity to experiential phenomena not discernible by an observer.*
Objectives-*Computed Tomography evaluation of patients with seizure disorder.****Material and Methods-*** *This prospective observational study is based on radiological findings in 110 patients suffering from epilepsy who were referred to the radiology department of Darbhanga medical college, Laheriasaraifor CT scanning over a period of 2 years. Ethical permission was taken prior to study from instituitional ethics committee. Informed written consent was taken from all the study participants fulfilling inclusion and exclusion criteria.****Results-*** *Majority of patients were males 68 (61.8%), most patients belong to 30-45years age group(35.45%). Patient with normal CT presented with generalized seizure in 35 (31.8%) patients, NCC 30 (27.7%) patients with focal to generalized seizure episodes. Duration of seizure in normal CT patients with seizure was less than 6months while in NCC patients it was 6months-1year. Solitary ring enhancement pattern was predominant finding in patients with granulomatous brain lesions. Frontal lobe was most common location in patient with neoplastic brain lesions.*
Conclusion- *Neuroimaging has an important role in the investigation and treatment of patients with epilepsy.*
Key words- Computed tomography, NCC, solitary ring enhancement.

Date of Submission: 10- 12 -2020 Date of Acceptance: 13-12-2020

I. Introduction

Epilepsy is a chronic non-communicable disease of the brain that affects around 50 million people worldwide. It is characterized by recurrent seizures, which are brief episodes of involuntary movement that may involve a part of the body (partial) or the entire body (generalized) and are sometimes accompanied by loss of consciousness and control of bowel or bladder function. Seizure episodes are a result of excessive electrical discharges in a group of brain cells. Different parts of the brain can be the site of such discharges. Seizures can vary from the briefest lapses of attention or muscle jerks to severe and prolonged convulsions. Seizures can also vary in frequency, from less than 1 per year to several per day.[1]

Three clinical observations emphasize how a variety of factors determine why certain conditions may cause seizure or epilepsy in a given patient endogenous factors, epileptogenic factors, provocative or precipitating factors.

In 1971 CT was introduced and a decade later MRI came into focus. These investigations had immediate and far reaching impact on epilepsy. These structural imaging techniques revealed pathologic lesions in large number of patients with hitherto cryptogenic epilepsy, widened the indications for surgical therapy and improved understanding of the pathogenesis and etiology of epilepsy. MRI has been proved far more superior over CT, specially in hippocampal sclerosis and malformation of cortical development (MCD)[3.]

Although the use of CT for epileptic patients has reduced with availability of MRI, CT is still the imaging of choice for these patients under certain conditions. CT can accurately detect hemorrhage, infarcts, gross malformations, lesions with underlying calcifications and large tumors. Although CT is often secondary or adjunctive importance, it serves as a significant backup to ultrasound in neonates and young infants.[4,5] However, the sensitivity of CT in patients with epilepsy has not been found to be higher than 30% in unselected patient population.[6] CT scan may fail to detect abnormalities in upto 50% of patients with epileptogenic structural lesions such as mesial temporal sclerosis, small tumor, malformations etc.

In order children and adults, CT is the technique of choice in the peri -operative state because it can rapidly detect recent hemorrhage, hydrocephalus, and major structural changes. Although CT is highly diagnostic, its role in the diagnosis of tuberous sclerosis, Sturge -Weber syndrome, and other conditions with intracranial calcification is complementary because MRI provides more information. CT overall has low sensitivity because of poor resolution in the temporal fossa. Thus, it is not surprising that CT is unable to detect mesial temporal sclerosis, the most common pathology in temporal lobe epilepsy.

Other work has demonstrated potential uses of CT perfusion imaging in evaluation and following cranial and extra cranial steno-occlusive disease, in assessing vasospasm after SAH, in distinguishing neoplasms from infections, and in confirming brain death.[7]

The five perfusion techniques provide a qualitative assessment of cerebral blood flow and are based on either the diffusible trace model (i.e. PET, SPECT, and Xenon CT) or the tracer kinetic model (i.e. CT perfusion, MR perfusion).[8]

II. Material And Methods

This study is based on radiological findings in 110 patients suffering from epilepsy who were referred to the radiology department of DMCH for CT scanning over a period of 2 years from October 2009 to September 2011.Ethical approval was taken from institutional ethics committee. Following strict inclusion and exclusion criteria all the patients were evaluated by cranial computed tomography in the Department of Radiology, Darbhanga Medical College and Hospital, Darbhanga. Scans were obtained on the Siemens 3D-Spiral computed tomography system, model Somatom AR- SP and Siemens somatom spirit dual slice fourth generation machine. CT examination generally encompassed 12 slices, each 10mm thick. Plain and contrast enhanced CT were done. The scans were recorded for future analysis. The cases were followed up during and after the treatment.

All the patients were scanned with Siemens Somatom AR-SP and Siemens Somatom Spirit fourth generation CT scanner. Scanning delay was 3-5 sec for each scan. Patient lies down on the examination table. The head was positioned with canthomeatal line as reference line and scans were taken parallel to it. The number of cuts and slice thickness was set. The full sequence of scans was done automatically with the CT scanner. The scan was repeated after intravenous injection of water soluble non-ionic contrast media. These scans were viewed and then recorded.

Protocol for plane and contrast CT scan brain:

(1) Region : Base of skull to vertex
(2) Patient position : Supine, arms by side of the body
(3) Place of imaging : Parallel to the canthomeatal line.
(4) Gantry tilt : -25 to +25 degree
(5) Contrast : Non-ionic - 1-2 ml/kg body wt.

Specification of CT scanner:

Mode	-	Sequence
Slice	-	5-8 mm (thinner sections in areas of interest)
Feed	-	5-8 mm
Pitch	-	1
Reconstruction	-	5-8 mm
Scan Orientation	-	Caudo-carnial
Scan delay	-	3-5 seconds
KV, mA	-	110-130kv, 160-240mA
Field of vision	-	200-250 mm

Window setting		**bone**
Width/centre	80/35	1500/450

Post Processing: Multiplanar Sagittal /coronal reconstruction to obtain three dimensional concept of the lesion.

III. Results

This prospective observational study conducted for 110 patients suffering from Epilepsy, who were referred to the Radiology Department, Darbhanga medical college and hospital, Laheriasarai, Bihar for Computed Tomography Examination performed over a period of 2 years from October 2009 to September 2011.

TABLE - 1
Total Number of patients examined

	Number	Percentage
Males	68	61.8%
Females	42	38.2%
Total	110	100%

In this study among the total no. of 110 cases, male patients examined were 68 (61.8%) whereas female patients were 42 (38.2%).

TABLE - 2
Age distribution in 110 patients with onset of seizures.

Sl. No.	Age group (in years)	No. of patients	Percentage
1	0-15	19	17.27%
2	15-30	35	31.82%
3	30-45	39	35.45%
4	45-60	12	10.92%
5	60-75	5	4.54%
Total	0-75	110	100%

Table deals with the age distribution of patients at the onset of seizures. Among these 49.09% were below the age of 30 years. Age groups between 15-45 years constituted 67.27% of patients. Incidence declined considerably after this age group.

TABLE - 3
Results of computerized tomography

CT scan abnormalities	**Number**	**Percentage**
Normal	35	31.8
Neurocysticercosis	30	27.7
Non-specific enhancement	11	10.0
Post-ictal oedema	2	1.8
Tuberculoma	4	3.6
Atrophy	12	10.9
Focal	8	
Generalised	2	
Lacunar infarct	2	
Congenital	3	2.7
Sturge-Weber syndrome	1	
Arachnoid cyst	1	
Hydrocephalus	1	
Cavernous angioma	1	0.9
Chronic extradural hematoma	1	0.9
Infection	2	1.8
Abcess	1	
Chr. Extradural Empyema	1	
White matter degeneration	1	0.9
Neoplasm	8	7.2
Primary	7	
Metastatic	1	
Total	110	
Abnormal	75	68.2

Table summarizes the CT scan result. Among the one hundred and ten patients scanned, 68.2% demonstrated CT scan abnormalities. Thirty patients (27.7%) presented with neurocysticercosis. Eleven patients (10%) had non-specific enhancement. Two patients (1.8%) had post ictal oedema. Four patients (3.6%) presented with Tuberculoma. Twelve patients (10.9%) presented with different types of atrophy and infarcts. One patient (0.9%) had cavernous angioma& one patient (0.9%) had extradural hematoma. Two patients (1.8%) presented with infection. White matter degeneration was present in 1 patient (0.9%). Tumors were present in eight patients (7.2%), two patients had oligodendroglioma while one patient had lymphoma, two patients had glioblastoma multiforme, two patients had astrocytoma & one patient had metastasis.

TABLE - 4
Comparison of CT results with seizure pattern

Result of CT scan	Generalized	Focal	Focal to generalized	Petit mal	Total
Normal	18	5	6	6	35
Neurocysticercosis	10	6	14	-	30
Non-specific enhancement	6	3	2	-	11
Post-ictal oedema	1	1	-	-	2
Tuberculoma	4	-	-	-	4
Atrophy	3	2	6	1	12
Congenital	3	-	-	-	3
Cavernous angioma	-	-	1	-	1
Extradural hematoma	-	-	1	-	1
Infection	-	-	2	-	2
White matter degeneration	1	-	-	-	1
Neoplasm	2	-	6	-	8
Total	48	17	38	7	110

Type of seizure pattern as compared with CT results depicted in above table. The patients were divided into four groups based on clinical findings. Those with highest percentage of abnormal scans (68.2%) were patients with focal seizures secondarily generalized i.e. 32(42.6%), patients with generalized seizures and focal seizures had abnormal scan in 30(40%) and 12(16%) respectively, one patient (1.3%) had petit mal Epilepsy.

TABLE - 5
Comparison of CT results with age of the patients

Result of CT scan	<15 yrs	15-30 yrs	30-45 yrs	45-60 yrs	≥ 60 yrs
Normal	3	12	16	2	2
Neurocysticercosis	5	15	9	1	-
Non-specific enhancement	1	2	7	1	-
Post-ictal oedema	-	1	1	-	-
Tuberculoma	-	1	2	1	-
Atrophy	3	3	2	3	1
Congenital	1	1	-	-	1
Cavernous angioma	-	-	1	-	-
Extradural hematoma	1	-		-	-
Infection	2	-		-	-
White matter degeneration	1	-		-	-
Neoplasm	2	-	1	4	1
Total-110	19	35	39	12	5
%Abnormal	14.5%	20.9%	20.9%	9%	2.72%

Table presents relationship of CT scan results with age of the individual at the time of examination. 41.8% of those individuals between 15-45 years had positive scans. 16 patients (14.5%) had abnormal scan who were less than 15 years old. Between 45 to 60 years, 10 patients (9%) show positivity. In age group older than 60 years 3 patients (2.72%) had positive scan.

TABLE - 6
Comparison of CT results with duration of Epilepsy

Result of CT scan	<6months	6m-1yr	1-5yrs	≥ 5yrs
Normal	15	2	13	5
Neurocysticercosis	7	12	10	1
Non-specific enhancement	2	2	5	2
Post-ictal oedema	1	-	-	1
Tuberculoma	-	3	1	-
Atrophy	2	2	5	3
Congenital	2	-	1	-
Cavernous angioma	-	-	1	-
Extradural hematoma	1	-	-	-
Infection	1	-	1	-
White matter degeneration	1	-	1	-
Neoplasm	-	3	-	5
Total	32	24	37	17
%Abnormal	29.09	21.8	33.6	15.9

Table outlines the relationship between the duration of seizures at the time of examination and CT findings. 32 patients (29.09%) had acute onset of seizures, 37 patients (33.6%) had onset of one to five years duration, while

24 patients (21.8%) had 6 months to one year duration. 17 patients (15.5%) had more than 5 years duration of onset of seizures.

TABLE - 7
Comparison of CT results with patients history

Result of scan	Seizure	Headache	Limb paresis	Trauma	Localised pain	Unconsciousness
Neurocysticercosis	21	2	3	1	3	-
Non-specific enhancement	11	-	-	-	-	-
Post-ictal oedema	2	-	-	-	-	-
Tuberculoma	1	1	-	-	2	-
Atrophy	6	1	2	3	-	-
Congenital	-	-	-	-	3	-
Cavernous angioma	-	1	-	-	-	-
Extradural hematoma	-	1	-	-	-	1
Infection	-	-	-	1	-	1
White matter degeneration	1	-	-	-	-	-
Neoplasm	-	5	3	-	-	-

Table shows clinical presentations in patients with epilepsy. Seizure were present in all the cases. Table shows the chief presenting complaints of the patients.

TABLE - 8
Comparison of EEG abnormalities with CT scan abnormalities.

Types of seizure	EEG	CT
Left hand to generalized seizure	Left temporal slow wave focus with sec generalization	Atrophy in temporal region
Right hand to generalized seizure	Left frontal slow wave focus	Left frontal Oligodendroglioma
GME	Left parieto occipital focus	Left occipital Tuberculoma
Right focal to sec generalized	Right occipito parietal focus	Tuberculoma
GME	Right hemispheric damage	Right frontal Tuberculoma
GME	Borderline generalized discharge	Normal

Table summarizes the patients who had EEG abnormalities.

TABLE - 9
Image morphology of disc & ring enhancing lesion in patients of Tuberculoma, non specific enhancement, Neurocysticercosis & Metastasis.

CT lesion	With oedema	Without oedema
Solitary ring enhancing lesion	12	13
Multiple disc enhancing lesion	2	5
Multiple ring enhancing lesion	3	2
Single disc enhancing lesion	4	1

Solitary ring lesion was seen in 25 patients (22.7%) with or without oedema. Multiple disc enhancing lesions were seen in 7 (6.36%) patients and single disc enhancing lesions were seen in 5 (4.54%) patients. Multiple ring enhancing lesions were seen in 5 (4.54%) patients.

TABLE - 10
Morphology of hypoattenuated lesions (Atrophy, Post ictal oedema, Arachnoid cyst).

CT lesion	Number	Percentage
Round hypoattenuated lesions	4	3.6%
Irregular hypoattenuated lesions	10	9%

Table deals with hypo attenuated lesions. Round hypottenuated lesions were present in 4 (36%) patients. 10 patients (9%) had irregular hypoattenuated lesions.

TABLE - 11
Morphology of mixed attenuation lesions.

CT lesion	Mass effect	No mass effect
Mixed attenuated lesion	6	2
Percentage	5.4%	1.8%

Table deals with mixed attenuated lesion, along with mass effect. 6 (5.4%) patients showed mixed attenuated lesion with mass effect by compressing & displacing the ventricles. They had also shifted the mid line. Two patients (1.8%) with mixed attenuation lesion did not show any mass effect.
One patient (0.9%) who was found to have cavernous angioma also showed calcifications in left occipital region on CT scan.
One patient (0.9%) showed predominantly hypodense mixed attenuation lesion over left frontal area suggestive of extradural hematoma.

TABLE - 12

Result of CT scan	Generalized	Frontal	Parietal	Occipital	Temporal	Basal ganglia
Neurocysticercosis	5	8	11	5	1	-
Non-specific enhancement	-	5	2	2	2	-
Post-ictal oedema	-	1	1	-	-	-
Tuberculoma	-	1	2	-	-	1
Atrophy	2	2	2	2	2	2
Sturge-Weber Syndrome	-	-	-	1	-	-
Infection	1	-	-	-	-	-
Hydrocephalus	-	1	1	-	-	-
Extradural hematoma	1	-	-	-	-	-
Cavernous angioma	-	1	-	1		
Arachnoid cyst				1		

Table deals with location of CT lesions in the brain among the patients. In neurocysticercosis 11 (36.6%) patients had parietal location, 5 patients (16.6%) had occipital location, in 8 patients (26.6%) lesions presented in frontal lobe, one patient (3.3%) had lesions in temporal lobe and 5(16.6%) patients had generalized lesions.

Non specific enhancement showed commonest location in frontal lobe. Tuberculoma had involved parietal lobe in 2 cases and one in frontal & basal ganglia each. In the case of Sturge-Weber Syndrome intracranial calcification was present in parieto-occipital region and was predominantly occipital. One patient showed abcess involving right frontal region. One patient had chronic extradural empyma over left parietal lobe. Hydrocephalus due to aqueductal stenosis was found in one case while one patient showed left frontal chronic extradural hematoma.

TABLE - 13
CT localization of neoplasms

Result of CT scan	Frontal	Parietal	Thalamus	Whole cerebral
Oligodendroglioma	1	1	-	-
Lymphoma	1	-	-	-
Glioblastoma multiforme	1	1	-	-
Astrocytoma	1	1	-	-
Metastasis	-	-	-	1

Tumours were present most commonly in frontal lobe. Next common location was parietal.

Follow up of 10 cases

We could follow up 10 patients. Out of these, 8 patients suspected to had ncc lesions were reviewed after a course of antihelminthic and antiepileptic drugs within 6 months interval. At 3 months 5 patients showed ring and disc enhancing lesions but with marked decrease in size and diminution of perifocaloedema. One patient showed complete resolution of the lesion. 2 patients did not show any response to the therapy and anti-tubercular drugs were added to them. One patient each of post-ictal oedema and non-specific enhancement showed complete disappearance of the lesions.

IV. Discussion

This study has been carried out over the past 2 years in one hundred and ten cases with epileptic seizures. The following study evaluates the use of computed tomography in seizure disorders and compares the CT results to the individual neurological findings.

Computed axial tomography (CT scanning) is a safe and effective technique for the investigation of structural intracranial diseases such as expanding mass lesions and cerebrovascular diseases, tuberculoma, atrophy etc. However, the so called non invasiveness of the technique may encourage its indiscriminate us (Young A.C. et al. 1982).[10]

Mc Gahn John et al. (1979) stated that EEG was useful in detecting significant pathology, but was nonspecific in etiological classification.[11] This suggests the continued use of EEG as an ancillary screening tool.

This series also demonstrated usefulness of skull examinations in epileptic patients. Despite the theoretical possibility of missing tiny (less than 1 mm) intracranial calcifications, CT is still, over all much more sensitive than plain skull radiographs in detecting calcifications of average size (4-5 mm) and intracranial pathology. In our study we could find calcification in cavernous angioma, Sturge -Weber Syndrome and in patients of oligodendroglioma and astrocytoma.

Du Boulay and Marshal (1975) demonstrated the superiority of CT over radionuclide studies in the over all detection of intracranial pathology. This is specially true for atrophic and hydrocephalic changes.[12]

According to the study of 150 cases by Mc Gahn et al. (1979) 40% patients demonstrated abnormal scans.[15] In another study (Young A.C. et al. 1982) of 240 patients, abnormalities were found in 68% (Wadia RS et 1987).[13]

In the present study 68.2% of patients demonstrated abnormalities on CT scan. This disparity appears because we particularly studied patients with high risk epilepsy or intracranial pathology.

The patients age of onset of seizures average 29 years were representative of epilepsy in general population (Young AC et al. 1982).[14] In the present study maximum patients (67.2%) had onset of seizures at the age between 15-45 years, 17.2% patients had onset of seizures below the age of 15 years& 10.92% patients between 45-60 yrs. In older age group after 60 years 4.54% patients had onset of seizures.

Weitz R. et al. (1982) found marked unilateral brain oedema in a new born who had multiple focal seizures on the 3rd & 4th days of life.[14] Cerebral atrophy in the previously oedematous area developed by 8 months.

In the present study CT findings below the age of 15 years are neurocysticercosis (26.3%), nonspecific enhancement (5.2%), atrophy (15.8%), congenital hydrocephalus (5.2%), abscess (5.2%), and tumours (10.5%).

WadiaR.S et al. (1982) found in 150 consecutive cases, the commonest lesion noted was a hypodense lesion on unenhanced scan, with a ring or disc like enhancement on contract studies and surrounding hypodensity.[13] This lesion was seen in patients below the age 15 years and in those with shorter duration of fits (less than 6 months).

In this study commonest lesion was found to be neurocysticercosis (32.4%) in patients of 15-45 years' age. Other abnormalities at this range of age was nonspecific enhancement (12.2%), post-ictal oedema (2.7%), Tuberculoma (4.0%), atrophy (6.7%), congenital lesions, (1.3%), cavernous angioma (1.3%) and neoplasm (1.3%).

In another series of study by Mc Gahn et al. (1979) CT abnormalities at 10-45 years were atrophy, hydrocephalus, vascular abnormalities at 10-45 years were atrophy, hydrocephalus, vascular abnormalities, infarct and neoplasm.

Shorvon SD et al. (1984) studied series of 74 patients presented with late onset epilepsy.[15] The median age at onset of epilepsy with ischaemic lesion was 62 years and they showed an increased incidence of systemic vascular diseases and abnormal neurological signs. Ischemic lesions were in the form of infarction.

In the present study, clinically 48 (43.6%) patient had generalized tonic-clonic seizures. 17 patients (15.45%) presented with focal seizures. 38 (34.5%) patients had focal to generalized seizures and 7 (6.36%) patients had petit mal epilepsy.

Associated features along with seizures usually are headache, limb paresis, personality changes, trauma, any congenital anomaly, unconsciousness, fever, sedative abuse. In present series associated features are headache, unconsciousness, personality changes, limb paresis, trauma and localized pain.

Out of 30 patients with intracranial neurocysticercosis, solitary ring enhancing lesions were found in 18 patients, solitary disc enhancing lesion were present in 2 patients, multiple ring enhancing lesions were seen in 2 cases. According to Bhargava and Tandon (1980) and Wadia et al. 1989)[13] ring shaped enhancement with central nidus is very characteristic and is almost confirmatory to the diagnosis of a Neurocysticercosis.CT is the most sensitive technique for detecting tuberculoma, however CT alone cannot differentiate tuberculoma from abscess or other granulomatous process. On macroscopic examination a tuberculoma is a well circumscribed grayish white mass (composed of epitheloid cells, lymphocytes and giant cell) with central caseatingnecrosis.In the present study 4 patients having generalized seizures showed findings suggestive of tuberculoma on CT scan. Findings were single ring enhancing, multiple ring enhancing, multiple disc enhancing and single disc enhancing lesions in one patient each.

Bangash IM (1987)[16] postulated that hyperdensity on enhanced CT was due to transitory increase of regional cerebral blood flow. We found such type of hyperdensity in 10% cases which were termed as non-specific enhancement which were of different patterns. In this study hypodense lesions suggestive of post-ictal oedema was present in 2 cases.

In the present study one patient presenting with seizure and headache had chronic biconvex extradural hematoma in left frontal lobe. No significant history of trauma was present. Another one patient with history of trauma and seizures showed chronic extradural empyema on CT.McGahn (1979)[11] found 6 cases of vascular malformation. In the present study one case of cavernous malformation presented with seizures &

unconsciousness and showed CT evidence of calcifications within a mixed density heterogenous mass on unenhanced scans.

CT scans can occasionally be helpful in determining the presence or absence of fine calcifications, but generally adds little to diagnostic accuracy.

Mc Gahn (1979)[11] found 6 cases of neoplasm of low grade astrocytoma, lipoma of corpus callosum, lymphoma and metastasis. D.F. Smith found that patients of primary intracerebral tumours presenting with epilepsy showed non enhancing, low density lesion on CT scan and a low grade tumour. In the present study 8 cases of neoplasms were present. Neoplasms were Oligodendroglioma, Astrocytoma, Glioblastoma multiforme, Lymphoma and one had metastatic lesions.In the present study one case with seizure had Sturge-Weber Syndrome. Lt. parieto-occipital serpiginous intracranial calcification was seen in CT scan.In present study one patient of White matter degeneration also presented with seizure. In this study we could follow up 10 patients. Out of these, 8 patients suspected to hadNCC lesions were reviewed after a course of anti-helminthic and antiepileptic drugs within 6 months' interval. At 3 months 5 patients showed ring and disc enhancing lesions but with marked decrease in size and diminution of peri-focaloedema. One patient showed complete resolution of the lesion. 2 patients did not show any response to the therapy and anti-tubercular drugs were added to them. One patient each of post-ictal oedema and non-specific enhancement showed complete disappearance of the lesions.

Disappearing lesions have almost exclusively been reported from India because of this an infection or infestation has been a prime suspect. 1/3 patients showed evidence of antibodies against cysticercus in serum.In our study, most common CT finding in NCC, that's why initial drug regimen consists chiefly of antihelminthics and anticonvulsants. After this, if patients did not improve then antitubercular drug was added. This regimen is followed in indeterminate cases. Initial treatment is also given according to ELISA results, if suggestive of any particular etiology.A combination of neurological findings and historical data (other than seizure) produce a high yield of abnormal CT scan. CT is till overall more sensitive than plain skull radiography in detecting calcification. It is also a safe and effective technique for detecting structural intracranial diseases.

In our study, also Neurocysticercosis is the most common etiology of seizure (27.27%) in organic epilepsy. However, 31.82% patients with seizures had normal CT scan and overall this is the most common finding in the present study.

V. Conclusion

110 patients of Epileptic seizures who attended Radiology Department, Darbhanga Medical College & Hospital for CT head scanning over a period of 2 years, were included in the present study. Clinical evaluation of patients were done on a preplanned proforma and CT scan lesions were evaluated. Follow up scans were done within 6 months interval from the last. The following conclusions were drawn :-->

Out of 110 patients, 49.09% patients were below 30 years of age. 67.27% of the patients were between 15-45 years of age. Incidence declined considerably after 45 years of age.Male: Female ratio was 1.6:1. Initially, CT scans were done in all patients. Follow up scans could be possible only in 10 patients.CT findings in patients with intracranial Neurocysticercosis were Solitary ring enhancing lesion (18), Solitary disc enhancing lesion (2), Multiple calcified lesions (8)and Multiple ring enhancing lesions (2).

Neoplasm has shown mixed attenuation lesions enhancing irregularly with or without mass effect in most of the 8 patients.The response of to antihelminthic and antiepileptic treatment in patients suspected to have NCC lesions were Decrease in size of the lesions and diminution of perilesional focal edema in 5 patients, one patient showed complete resolution of the lesion and two patients showed no response. ATT was added to them.

one patient each of post-ictal edema and non-enhancement revealed complete disappearance of the lesion on follow up scan.In present study it seems that neurocysticercosis is the leading organic cause of seizure disorder, but it may be due to decline in cases of tuberculoma.

During this short duration of observation, we have experienced that computerized tomography of the brain is a safe and effective technique for the investigation of structural intracranial disease such as expanding mass lesions, cerebrovascular diseases, tuberculoma, atrophy.

Acknowledgement-

I thank all my study participants for participation in the study.

References

[1]. World Health Organisation.
[2]. Harrison's – Principles of Internal Medicine 17th edition.
[3]. Epilepsia-2009 March; 50 supplement 3: 39-49.
[4]. Guberman A. and Z.F.G. Jawprslopseudohypothyroidism and epilepsy : diagnostic value of computerized cranial tomography, 1979 epilepsia vol. 20:541-553.

[5]. Wilden JN, Kelly PJ : CT computerized stereotactic bipsy for low density CT lesions presenting with epilepsy. J. Neurol. Neuros Psychi 1987 Oct., 50(10), 1302-5.
[6]. Gastaut H, Gastuat JL, Computerized transverse axial tomography in epilepsy. Epilepsia1976 ; 17 : 325-336.
[7]. Barrow Quarterly (Volume 24, No.2, 2008).
[8]. Barrow Quarterly (Volume 17, No.3, 2001).
[9]. Devous MD Sr. SPECT in neurotherapeutics. Neuro Rx 2005;2:237-249.
[10]. Annual of Indian Academy of Neurology Year 2011, Volume 14, Issue-2, page 78-80.
[11]. Juhasz C, Chugini DC, Muziko et al. AMT PET detects epileptogenic cortex in children with intractable epilepsy. Neurology 2001;57:1629-30.
[12]. Young A.C. Constanzi Borg J. Mohar P.D. Forbes DT Clair W. Is routine computerized axial tomography in epilepsy worth while?
[13]. Gahn Mc John P., Md, Arthur B. Dublin, M.D. Richard P. Hill : The evaluation of seizure disorders by computerized tomography. J. Neurour 50:328-332.
[14]. Boulay Du, G.H., Marshall J.: Comparison of EMI radioisotopic imaging in Neurological Disease Lancet 2:1294-1297 (1975).
[15]. Wadia RS: Focal epilepsy in India with special reference to lesions showing ring disc like enhancement on contrast CT. J. of Neurol, Neursur and Psychiatry 56: 1298-1301 (1987).
[16]. Weitz R.S. Matx, P. Merlos and S.H. Reinser : Brain oedema in neonatal seizures. The value of computerized tomography in the early diagnosis and follow up. Acta R Paediatr Scan 71:873-876(1982).
[17]. Luciano AL, Shorvon SD: Results of treatment changes in patients with apparently drug – resistant chronic epilepsy, Ann Neurol 62:375, 2007.

Dr. Nisha Rai. "Computed Tomographic Evaluation of Patients with Seizure Disorder." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(12), 2020, pp. 35-43.