DISCUSSION
Epilepsy is a common illness. Five per thousand population seems to be affected (College of General Practitioners, 1968). The overall prevalence rates per 1000 of the general population vary from 1.3 in Fermanagh (Lin, 1955) and 1.5 in Niigata, Japan (Kato, 1964) to 9.3 in Warsaw (Kaliszuk, 1974a) and as high as 19.3 in Bogota, Colombia (Gomez, Arancibia and Torres, 1970). In over half of the studies the rates lie between 4 and 10 per thousand. In most of the studies where rates were lower than 4 per thousand information was obtained solely from a review of medical records or from general practitioners. Considering prevalence rates of 9/1000 (Khalil, 1971) and accepting this figure for the whole country millions of epileptics are acceptable. The workload of investigating these patients is a difficult task especially in India where neurological centers with specialized facilities are few. Most of the cases of epilepsy remained undiagnosed for long time as the disease is still not accepted as organic illness by a large number of people in our society. Disease is thought to be caused by devil so many people seek faith in healing by itself. There has been considerable progress in the epileptology over the past two to three decades.
with the help of the sophisticated EEG related
techniques, the diagnostic part of the disease is
improved. Considering the problem of epilepsy and new
developments especially in diagnostic field we had
concluded a clinical and EEG study of epilepsy.

GENERAL DATA ANALYSIS

AGE

Age specific prevalence rates in several
studies (Rusie et al., 1964; Joel-Jansen, 1976 and
Kasuar et al., 1985) have been found to be lowest in the
first decade and rising gradually upto the fourth
decade. In this study majority of the cases had first
attack at second decade, then there was a gradual
decline, while in other studies, majority of the cases
had first attack in first decade.

SEX

In this study slightly more than one fourth
of the patients were females. This finding is exactly
similar to the study done by Binit et al (1989). Females
were seen said to suffer from epilepsy slightly more
frequently than males. In Iranian study of 1000 cases
the ratio of female to male was 12:18. However the sex
incidence is in changing pattern. In one study male/
female ratio was 1.5 : 1 (Dhollander, 1977). Similar
observations were found by Vimsali and Janney, 1964;
In the present study male dominance might be because of Indian society especially in rural population gives more importance to males because they are the earning members of the family.

**Clinical Features**

It is important to know the prevalence of various seizure types in epileptic population. There had been many studies on clinical classification. In the present study, the seizures have been classified on the basis of the classification given by Narasim and Reynolds (1982). Seizures were classified as generalised, partial secondary generalised and unclassifiable. Content et al (1975) studied 6000 epileptics and they worked out their different classifiable groups and their relative frequency in children and adults. A similar study (Joshi et al., 1977) has been carried out in India. Both these studies were based on classification almost similar to that used in the present study. Primary generalised seizures dominated our series (63%) in comparison to 36% in the series of Content et al. (1975), 38% in the series of Joshi et al., 1977 and 31.7% in the study of Smit et al., 1980. In the above studies of Content et al., 1975; Joshi et al., 1977 and Smit, 1980, the number of cases of absence seizures was 36%, 26% and 25% respectively. We had seen across a case of Lennox Gastaut syndrome, which is a petit mal variant. This could be because of
a smaller sample of the study. Cases of secondarily generalized were frequently found in our study (21%) as compared to the above study of Cantaut et al (1973) (13%) and Joshi et al. 1977 (19%). The study conducted last year in this institution by Jhit J. S. (1988) has shown 34.2% cases of secondarily generalized which is approximately similar to this study. In our study the percentage of simple partial seizure was low in comparison to those observed by Joshi et al, 1977 (20%). On the other hand frequency of complex partial epilepsy was almost equal (9.3%) in this study and (7%) in that of Joshi et al, 1977.

FEATURES OF PRIMARY GENERALIZED SEIZURES

This was the commonest type of seizure. The patients included in this study having generalized seizures and unconsciousness without any focal onset or presence of aura. It included idiopathic and symptomatic epilepsy both. In some patients frequency of seizure was high, 43% of cases had seizures several times a day, biweekly, weekly or monthly. Earlier to this seizure frequency of seizure was reported by Sharvon (1987) where one third of the cases had seizures several times a month. Figures of our study is higher than the figure in the study conducted by Sharvon. This is possibly because in our community people seek medical advice when the illness goes advanced and disabling.
Out of 124 cases of primary generalized seizures some etiological factors were found in 20 (16.1%) cases. In the study of Shevlin (1967) some cause or other could be detected in about one third of the cases of all epilepsy. The figure was or less nearer to the present study. In the present study etiological factors were in the form of head injury in 28 (22.6%) cases, birth asphyxia in 6 (4.8%) cases, inflammatory brain disease in 4 (3.2%) cases. Most of them were intracranial space occupying lesions, fever, migraine, rheumatic heart disease and whereas sclerosis. We had 14 (11.2%) cases who was the oldest child of the family. This is possibly because of increased liability of the first born to head injury during birth. In the study of Masser et al (1986) it was shown that the head injury (22.6%) was the commonest cause of epilepsy and the least common cause was the birth injury (3.2%) while intracranial infections caused epilepsy in 10.9% cases.

Our figures in respect to head injury are less than the above mentioned study. This may be because of the majority of the cases of primary generalized epilepsy having head injury were in the pediatric age group. Children often cannot head injury from their parents secondary healing of vessel is better in childhood. Most of the children do not remember about the injuries which was to occur during playing. As compared to the study of Masser et al (1986), the incidence of birth injury was
slightly higher, possibly because of lack of sophisticated obstetric services especially in rural population of India.

In this study migraine, rheumatic heart disease and tuberculosis sclerosis were also seen as an aetiological factor. Though loss of consciousness at the height of headache is usually syncopeal there is slightly increased incidence of epilepsy in migraine sufferers, even in those who have no evidence of cerebral lesion. A possible role of tyramine in the physiological mechanism of the two disorders was postulated by Scott, Goldstuck and Booth (1978). In present study, 1 case was of rheumatic heart disease having mitral stenosis along with mitral regurgitation but no evidence of embolism was seen. Epilepsy associated with rheumatic heart disease were often than can be explained by chance. Mitral valve disease small cerebral emboli may cause epilepsy as may a small asymptomatic infarct due to intracranial atheroma (Judge, Richardson and Victor, 1964). In this present study one case had tuberculosis sclerosis having aseptic aseptic convulsions. Alveolar patch and normal intelligence and no evidence of generalized seizures. Tuberculosis sclerosis (Spielman) is manifested by a clinical triad of convulsive seizure, mental deficiency and aseptic aseptic encephalitis. Pathological dissection of tuberculosis sclerosis is given by Irish (1976). Our patients had convulsive
seizures and seizures aseures but the intelligence was normal. This is possible because new some partial forms of tuberculous sclerosis is increasingly recognized. The three cases reported in detail by Devilew and Vines (1961) were of superior intelligence. Although all the cases had radiological evidence of cerebral involvement as well as lesion of tuberculous sclerosis elsewhere, Loges and Owen (1967) reviewed the records of 71 patients with tuberculous sclerosis studied at the eye clinic. Of the 69 patients on whom there were records of intellectual capacity and normal intelligence, 10 of these 69 had seizures.

Reservoirlike features were present in 7 (5.1%) cases. They were in the form of headache, vertigo, disinterest in environment and an abnormal feeling.

Focal convulsive features were seen in 61 (54.5%) cases in the form of headache in 30 (26.8%) cases, sleep in 13 (11.6%) cases, headache and sleep in 15 (13.1%) cases, weakness in 6 (5.4%) cases and phlebitis in 2 (1.8%) cases. Each of the features were nausea, dizziness, running nose and there, sweating and palpitation. These features were found more in children. According to Infield and Richardson (1963) children to not go through postdental phase and if these are present then they usually disappear completely within a minute.
On doing neurological examination, 6 cases were mentally retarded, 3 cases had behavioural abnormality, 2 cases had achimaphonia and one case had third nerve palsy.

In present study 6(4.6%) cases were of mental retardation. In the series of 1500 cases of all types of epilepsy including 2000 of generalised epilepsy, Sharvon (1957) found neurological deficits in 9.6% cases, mental retardation in 6% and behavioural abnormalities in 56% cases. These were higher number of cases of mental abnormality in the present study which is probably due to birth as a cause of most of the deliveries were conducted in the rural area and most of the time history of birth injury or as a cause was not available.

In a study by From et al (1974) it has been shown that out of 94 patients having birth as a cause 28 cases had neurological deficits and 40 had convulsions.

In other investigations except EEG, CT scan and CER examination showed abnormality. WBC, blood sugar, serum calcium and X-ray skull showed no abnormality.

CT scan could be done only in 17 cases out of which 16 of these cases were normal. 1 had petechial into gums and 1 had corneal pterygium ampoule tumour, 1 patient had secondary metastatic deposits and 1 had calcified patch in frontal area.
In CT scan, other studies were conducted by Constant (1976) who observed 30.2% abnormal cases in series of 1702 cases. Young et al. (1976) assessed 296 children out of which 38% abnormalities were seen. In the present study, 1 patient had only 3 seizures at a one-month gap, where CT scan showed a gyralism. Young et al. (1989) showed that even a solitary focal seizure is likely to result a structural abnormality.

NEUROLOGICAL AND CLINICAL CORRELATION

NEC abnormalities were present in 50 (47.8%) cases of generalized epilepsy. This figure is higher as compared to other studies i.e., 30-66% (Mish et al., 1988). This could be explained as account of higher number of children, higher frequency of seizures and many NEC were done within twenty-four hours of the last attack. Out of 15 patients having seizures several times a day NEC findings were normal only in 3 patients. NEC findings were generalized in 33 patients, hypersynchrony, asynchrony and Lennox-Gastaut syndrome in 1 patient each.

We had some seizure, 3 patients of mental abnormality out of which 3 patients had shown generalized brain damage in the NEC. Generalized convulsions were a common feature of brain damage.

One NEC showed hypersynchrony. Patient was 3 years old, who had episodic one-year lump, had generalized convulsions. He was mentally abnormal. His
EDS showed spike and polyspike discharges on continuously abnormal background of diffuse high voltage arrhythmic slow activity. In a series of children Frickern and VanPatter (1971) showed hypersynhythmic EDSs during the first year of life. There was a mortality of 20% cases. The majority of them died before the age of 3 years. One case of systemic epilepsy has shown the typical features of systemic epilepsy. EDS showed high voltage spikes and slow waves which were bilaterally synchronous. The spikes were frequently multiple occurring in groups of two to six. This finding was similar to that of Constant (1950a) who called these sequences as 'polyspikes and waves'. One case showed the EDS findings of Lennox-Constant syndrome, clinically having tonic seizures and most of the time the frequency of spikes and wave pattern was two and a half Hz. This finding was more or less similar to the finding of Mossell (1963), who described the syndrome clinically by listedasting, systemic and tonic seizures and electrically by absent news 2 Hz spike wave activity. The frequency may even be faster (3 Hz) spike wave patterns. Family history was negative.

MEASURES OF SECONDARY GENERALIZED EPILEPSY

In the present study out of 200 cases, 44 (22%) cases were of this type of epilepsy. In this study clinically 17 cases were found to have focal features with secondary generalization, another 27 cases who were
clinically thought to be the cases of primary generalized seizures, were found to have the evidence of focal onset in ESC. This might be possible because of rapid spread of focal discharge.

Majority of the cases (10, 40.9%) had seizures several times in a month. This figure is similar to that of generalized epilepsy.

Aetiological factors were present in 11 (33%) cases in the form of head injury - 5 cases, inflammatory brain disease - 2 cases, intracranial space occupying lesion - 1 case. This figure is slightly less than that of primary generalized seizure (38.8%). In a series by Joshi et al (1977) aetiological factors were present in 66% cases. The lesser incidence of aetiological factors was because we could perform CT scan only in 5 cases, which is now the essential investigation in the seizures of focal onset. According to Cortes et and Cortes (1976) CT scan detects 20% more cerebral lesions than the combination of long established techniques like skull X-ray, EEG and angiography.

Precipitating factors were present in 6 cases (19.3%) in the form of sleep - 4 cases, fatigue - 1 case, anesthesia - 1 case and eating dinner - 1 case.

Respiratory symptoms were present in 2 cases in the form of headaches and dizziness.
CLINICAL SEIZURE PATTERN

Out of 44 cases, 15 cases had focal features in the form of tonic spasms, twitching at the angle of the mouth or in the fingers or clonic movements in the one upper limb and in the lower limb on the same side. Two cases had tingling numbness in lower limbs and one case had abnormal sensation in lower extremities. Autonomic features were present in two cases in the form of epigastric sensation. 27 cases had generalized convulsions.

Associated neurological features were found in 3 cases. These were having mental retardation — 1 case, asepsisphrenics — 1 case and tubercular meningitis with papilloedema and third nerve palsy in one case. EEG of this patient showed focal epilepsy of left side with secondary generalization. Of cases had shown parietal lobe seizures in left side. Clinically he was having focal onset on the right side of the limbs.

EEG FINDINGS AND CLINICAL CORRELATION

In 44 cases, 10 cases had an normal EEG. 17 cases had shown a focus getting secondary generalized and 17 cases had shown a focus in EEG but clinically generalization was seen.

There were 3 such cases who have generalized discharge in EEG but clinically only focal features were seen. Among these cases 4 cases had a central focus.
In 2 cases bilateral focus was seen. This is probably because of mirror image (Kiloh et al, 1968) due to commissural fibres in the brain.

**FEATURES OF SIMPLE PARTIAL SEIZURES**

In our study out of 100 cases 17 (8.0%) cases were of simple partial seizures. The percentage was more or less similar to that of complex partial seizures. Percentage of this series is more (10.6%) than the study conducted last year in this institution. Other studies reported 8% simple partial seizure (Sheren (1967) whereas 5% and 6% cases of simple partial seizure were reported by Constant et al (1975) and Joshi et al (1977) respectively. Age ranged from 8-40 years. None of them had status epilepticus. In this series also frequency of seizures was high. Out of 17 cases 5 had seizures several times in a week. Preceding factors were found in 5 (29%) cases out of which 3 (17.6%) cases had head injury and 2 (11.7%) cases had birth asphyxia. All the 3 cases of head injury were 2-5 months old. Joshi et al (1977) had found head injury in 13% cases. They found some antecedent factors in 26% cases. Neurological deficit was found in one case in the form of anaplegia. A lady of 12 years of age had focal clonic movements in her left leg after which she had anaplegia in the same leg associated with vomiting. Her 67 cases
revealed large intracerebral haemorrhage. She died after two days of the epileptic fit. In the simple partial seizure associated neurological deficit was found only in one case as compared to focal with secondary generalization where neurological deficit was seen in 3 cases.

**CLINICAL SEIZURE PATERN**

Out of 17 cases, 14 had focal clonic movements and 3 had sensory symptoms in the form of tingling numbness and burning in feet. In all the 9 cases seizure started from finger or thumb except in one case. Out of 17 cases 8 had right sided symptoms and 9 had left sided symptoms. Start of seizure from thumb or finger may be due to representation of hand in brain in under prominent part of skull and is more prone to injuries as compared to nose and angle of the mouth. Post convulsive features were found in 7 cases in the form of weakness, tack's palsy, headache and sleep.

**2.2. FINDINGS IN SIMPLE PARTIAL SEIZURE**

Out of 17 cases, EEG abnormalities were found in 9 (53%) cases. Out of these 9 cases, all the cases showed focal abnormality. Out of which 5 cases had right sided focus. One case had left sided focus and 3 cases had a combined focus.
In above findings 2 cases were having right sided focus and convulsions were occurring in right side. No explanation could be given to this finding. The same finding was observed by Dutt, 1969.

CT scan could be performed in 4 cases. One showed large intracerebral haemorrhage. EEG of this patient was normal. In study by Yang et al (1988) approximately half of the patients with simple partial seizures had positive scan. In this study only one CT scan had finding. This may be because we were not able to perform CT scan easily because of its cost factor and non availability in this city.

FEATURES OF COMPLEX PARTIAL SEIZURES

Psychomotor epilepsy is a clinical finding while temporal lobe epilepsy is a EEG finding. Not all the cases of psychomotor epilepsy have a temporal lobe focus and not all the patients with temporal lobe focus in EEG exhibit psychomotor seizures (Severus, 1966). Out of 289 cases, 154(53%) cases turned out to be the case of complex partial seizures.

All the patients were below 30 years of age. Seven were females and ten were males.

Shaila (1975) found that majority of the cases had the onset of seizures below the age of 20 years. Most of them had their first fit before the age of 10 years. This observation was against the earlier belief
that temporal lobe epilepsy was a late form of convulsive disorder. Gibbs et al (1966) found that only 9.2% of cases of epilepsy below the age of 20 had temporal lobe epilepsy. Stevens (1966) found that temporal lobe epilepsy was the disease of adults. Currie et al (1971) reported maximum incidence of onset of seizures in third and fourth decade of life in their study of 665 cases of temporal lobe epilepsy. However, Misi et al (1957) reported that 42% cases had their first attack in the first decade and over 78% in the first two decades of life. Leonard and Souto (1959) and Rocky (1971) drew the similar conclusion. This apparent contradiction may be explained by improvement in the methods of diagnosis and by the fact that in children the initial attacks are not of the classical psychomotor type and are easily missed (Valavanis and Tazler, 1970). Most of the patients had onset of seizures from 3 months to 2 years. In the series of Rocky (1971) mean age was 4.43 years. Agathocle et al (1970) in a series of epilepsy in general, found the mean duration to be 7.8 years. In both these studies patients were either taking irregular treatment or no treatment was taken at all. In this present study out of 28 patients, 9 were taking regular treatment, 7 cases started taking treatment after being daily investigated and some were taking treatment regularly. Explanation for irregular treatment in these cases is because the illness in these patients was distressing.
and making them unable to perform their professional work. Out of which most distressing was transient loss of memory in 6 cases, and 6 cases the frequency of seizures was high i.e., daily or biweekly. In the series of Sathia et al. (1979) about two thirds of patients had seizures daily or weekly which is more or less comparable with this series. Lesser frequency was reported by Currie et al. (1971) where two thirds of the patients had fits twice a month. Out of 15 cases, only 2 (13.3%) cases had an etiological factor in the form of head injury. In the study conducted last year in this institution (Mishra, 1989) out of 9 cases only 1 case had etiological factor in the form of cerebrovascular accident which he had for months prior to the onset of the seizures. This is more or less similar to our study. In the literature workers could not get etiological factors in 22.9% -65% of cases of their series (Buscomer et al., 1984; Hird et al., 1997; Bhardwaj, 1971 and others, 1998).

Lesser percentage of etiological factors in this present study may be probably because of the smaller sample and mostly people were not able to go for CT scan (because it is an expensive investigation), which detects 95% more cerebral lesions than the combination of less established techniques (Small x-ray, EEG and angiography etc.).
Two (13.3%) cases had a positive family history while family history was positive in 11.7% cases of Mint (1989) and 14.3% cases of Makhia et al (1979).

CLINICAL MANIFESTATION

Out of 15 cases, 13 had features of psychomotor epilepsy and 2 cases had features of grand mal epilepsy but EEG had shown a focus in temporal lobes. Aura occurred in 9 (60%) patients out of 15 cases. It was in the form of visual hallucinations in 3 cases, voices heard in the ears in 1, hypoaesthesia in 2, fear in 1, wandering in 1, sounds seems in 1 and dizziness in 1. Currie et al (1971) reported visual aura in 18%, auditory in 16% and olfactory in 12%. Aura in the form of laughing and crying can occur in the same patient (Owen et al, 1972 and Sethi and Sanyal, 1974).

Aura has been found in 60% of cases (Makhia et al, 1979). The commonest was visual hallucinations (as in this present study) followed by vertigo and epileptic sensation. Olfactory and gustatory aura are said to be diagnostic of temporal lobe seizures are in that case (De Jorj, 1957 and Busch et al, 1986). In our study out of 15 cases, behavioral abnormality was found in 1 case. A significant greater number of temporal lobe epilepsy do have emotional disturbances in childhood and psychiatric abnormalities in later part of 12th, in comparison to patients with grand mal epilepsy (Makhia et al, 1979).
Out of 15 patients of temporal lobe epilepsy one patient became hypersual during the attack.

Abnormal sex behaviour associated with temporal lobe epilepsy has frequently been described in man (Constant and Colado, 1964; Nasbini and Sinisi, 1967 and Hirose and Goodwin, 1966) and in animals (Khervir and Zucy, 1939). Occurrence of hypersuality in association with temporal lobe epilepsy is rather rare (Tayler, 1962b). In this study of 100 patients only one was hypersual. A large number of temporal lobe epilepsies were found to be hypersual (Dahlin et al., 1970).

Motor phenomena was present in 2 (13.3%) cases in the form of lateral deviation of head, eye and hypostasis. In study of Nasl (1964), 10% of psychomotor epilepsies had motor symptoms. In the present study automatism was present in 7 patients in the form of smacking of lips, running, locking up, wandering and walking in a circle. Motor phenomena and automatism have been described under the case heading of automatism (Khevir, 1937). Combination of motor phenomena and automatism is a essential feature of complex partial seizures as majority of the cases had these features.

Out of 15 patients, 3 had generalised tonic-clonic seizures and 2 had focal tonic seizures. Several authors include these psychomotor manifestations as a clinical feature of psychomotor seizures (Nasl et al.,
1984). Lennox (1969) described psychomotor seizures as characterized by 'automatic' subjective and tonic focal signs.

**EPC FINDINGS**

The investigation which showed positive findings was the EPC in all cases and CT scan in 1 case. EPC showed finding in 10 (66.67%) cases out of 15 cases. In the present series 3 cases had normal EPC. Out of 10 abnormal EPC, all showed a temporal lobe focus. Among these 10 cases of temporal lobe focus 5 cases had very frequent discharges that too got enhanced in sleep recording. Five cases had right temporal focus and 4 had left temporal focus and 1 had bilateral temporal focus.

Only 4 patients could afford CT scan, granuloma in temporal lobe was observed in one case. EPC of this case showed a mirror image.