REVIEW OF LITERATURE
Chapter-II

REVIEW OF LITERATURE

Description of emotional disorders in epilepsy appear as far back as the earliest medical literature including the works by Hippocrates. Over the years several authors have studied this correlation between two conditions, most agreeing to higher prevalence of mood and affective disorders in epilepsy, few denying any specific relationship. Depression appears to be the commonest presentation of mood disturbances, but other mood disorders are by no means absent in epileptic patients.

In keeping with the one of the classification of psychiatric disorders in epilepsy there are broadly two major types of affect and mood changes: Peri-ictal and Interictal. In addition to the variables of seizure the psychosocial aspects of epilepsy are also believed to play a role in the evolution of mood disturbances in epilepsy. Keeping this in view the available literature on affect and mood changes in epilepsy is reviewed:-

Ictal and Peri-Ictal Disturbances of Mood and Affect

Ictal and peri-ictal disturbances of mood and affect have been suspected for long but have not been as well documented in literature.
Reynolds (1861) was one of the first to describe the syndrome of perietal mood changes when he reported sudden lowering of spirits as part of an epileptic aura. Mulder and Daly in 1952 described the psychiatric symptoms of 100 non-institutionalized patients who had lesions of temporal lobe, and noted 15 with ictal mood changes of whom 10 were said to be dysphoric.

Williams (1956) in 2000 personally seen patients with epilepsy found 100 who felt emotion as part of the attack. Of these 61 had ictal fear, 21 ictal depression and 18 some other ictal emotion including elation in 3 patients and also emphasized the occurrence of short lived dense depression as an immediate sequel of a convulsion as particularly striking, emerging from the post-ictal confusion and ending quite quickly.

Standage and Fenton (1975) reported that patients with more complex or affectively intense auras are at increased risk for developing psychosis, a view shared by Jensen and Larsen (1979). Hermann et al. (1982) reported that patients who had fear as part of an aura had a higher MMPI score than those who did not. Presence of ictal fear was a more powerful predictor of psychopathology than seizure type.

Periods of laughing around the ictal period was probably recognized since the late 19th century. In 1957 Daily and Mulder proposed the name Gelastic epilepsy for epileptic or ictal laughter.

Currie et al. (1971) in a survey of 666 patients from the London Hospital between 1949-1967 found emotional disorders as a component of the attack in 19 per cent of the patients and usually were unpleasant in nature in 96 patients. It was also noted that half the patients with emotional components had a
history of psychiatric disorder; conversely in half of the 124 patients who had such a history there was an emotional component in the attack.

Silberman et al. (1994) in an attempt to assess the possible relation between aura phenomena and interictal psychopathology studied 21 patients receiving treatment at the Mid Atlantic Regional Epilepsy Centre, Pennsylvania. Aura characteristics were assessed with Silberman-Post Psychosensory Rating Scale, psychiatric disorders with SADS-L, psychopathology with MMPI and psychosocial functioning with Washington Psychosocial Seizure Inventory (WPSI). Paroxysmal affect as ictal experience was noted in 14 per cent of the patients. Psychosensory symptoms occurring in the absence of frank seizures, but not those occurring with seizure were related to increased psychopathology primarily mood and anxiety related.

Mendez (1994) after a review of literature reported that changes of emotional experience can be manifestations of epileptiform activity in the limbic system and when mood or affect changes arise in isolation as simple partial seizures they may be difficult to distinguish as epileptic phenomena. Disorders of ictal affect include gelastic (or laughing seizures), dacrystic (or crying seizures) and aggressive behaviour but are relatively rare. Mood and affect changes occur during the immediate post-ictal period and may not be accompanied by the altered sensorium. These changes can last 1-2 weeks. Mania is characterized by irritability (more than euphoria), agitation, paranoia and mood congruent delusions.

Mania and Hypomania in Epilepsy

Mania and hypomania are not frequently reported in literature and most
of the references are either case reports or an indirect assessment of the relationship between the two entities.

Flor-Henry in 1969 suggested when patient had a combination of TLE and psychosis, a non-dominant (usually right sided) was associated with a manic-depressive psychosis as compared to schizophreniform presentation in involvement of dominant (generally left sided) abnormality. Cohen (1980) has also documented cases of mania in association with right brain lesions.

Roberts et al. (1982) described a case of epilepsy with a manic depressive presentation. Toone et al. (1982) in a retrospective investigation reported three cases with evidence of bipolarity among 69 patients with a combined diagnosis of epilepsy and psychosis. Wolf also in 1982 carried out literature search, found nine case reports of mania (in the non-English language literature) in patients with epilepsy and also reported six cases of his own with mania and epilepsy.

Silberman et al. (1985) investigated the converse phenomenon - the occurrence of transient sensory, cognitive and affective changes resembling those described by epileptics, in affectively ill patients. Forty-four patients with affective illness (including 34 Bipolar disorder) 37 with CPS (complex partial seizures) and 30 hypertensive controls were interviewed to determine the lifetime occurrence of these phenomena. Such symptoms occurred frequently in association with episodes of affective illness and epilepsy but were rare in control group. These similarities between the two groups may be due to similarities in pathophysiology of their two disorders.

Ojemann et al. (1987) documented 3 cases of bipolar illness in a series of over 2000 patients with epilepsy. While Robertson et al. (1987) reported two
cases with a history of Bipolar illness in 66 patients with a combined diagnosis of depression and epilepsy who had qualified out of 80 consecutive adult, English speaking referrals to Department of Neuropsychiatry at the National Hospital over a two year period.

Barczak et al. (1988) reported three cases fulfilling DSM III and RDC criteria for mania. They were all very similar in that they were all middle aged men with right sided TLE who became hypomanic following increase in complex partial seizure and who displayed mood congruous delusions with a predominantly religious theme. Symptoms were short lived (1-2 weeks), occurred in clear consciousness and there was no EEG evidence of status. Once seizures were well controlled the patients tended to remain asymptomatic.

Kessler et al. (1989) reported 3 patients with affective disorders with psychotic features (2 with Bipolar affective disorder) who were refractory to various combinations of psychotropic agents (including antipsychotics). Closer scrutiny revealed a seizure history in 2 patients and unusual neuropsychiatric features in 3rd patient. Subsequent substitution of carbamazepine for the antipsychotic resulted in control of patients psychosis. This study also suggested a hypothesis that the psychopathology observed in these cases is related to kindling whereby subictal electrical activity in the limbic system possibly exacerbated by a lowering of seizure thresholds by antipsychotic medication provokes behavioural phenomena that resemble functional psychiatric disorders (e.g. Bipolar affective disorder).

Blumer and Zielinski (1988) studied 19 patients with epilepsy referred for treatment of their psychiatric illness and found that 5 patients with depression
had also experienced manic like episodes: one patient suffered from a persistent hypomanic state without any symptoms of depression.

Johnson and Campbell (1990) reported a patient with an abnormality in the right temporal lobe who presented with episodes of mania many years before the classical manifestation of both a simple partial and complex partial seizure.

Sarvard et al. (1991) described a typically manic post-ictal psychosis in a 39 year old patient who had CPS, which necessitated treatment with haloperidol. After a right temporal lobectomy, including resection of the amygdala, her post-operative course was complicated by hypomanic symptoms such as irritability, hyper-religiosity and suspiciousness but no frank psychosis. Taylor in 1991 also described 2 patients with epilepsy and mania and further 2 patients with epilepsy and manic-depressive illness.

Robertson in a review of the world's literature in 1992 found only 42 recorded cases of epileptic patients with mania.

Fiordelli et al. (1993) took one hundred patients with cryptogenic epilepsy and normal intelligence and 100 age and sex matched controls. Both groups were submitted to psychiatric interview using clinical interview schedule. Out of epileptic 4 patients showed elation and euphoria as compared to two in the control group. But none fulfilled the criteria of manic disorder on DSM-III-R and classification.

Mendez (1994) in a review of literature reported that mania and hypomania are not common in epilepsy and quoted prevalence of 4.3 per cent with Bipolar disorder (based on a study by Toone et al. in 1982) and frequency of 3 to 2 per cent of bipolar disease among selected depressed epilepsy patients to none among 72 psychiatrically hospitalized patients with epilepsy (Betts).
Silberman (1994) in a study of 21 patients with a variety of seizure types reported one case each of mania and hypomania based on DSM-III-R and lifetime diagnosis.

**Interictal Depression**

Depression is probably the most common psychiatric disorder among patients with epilepsy. The relationship between the two have been mentioned even in ancient medical literature.

Several authors have carried out studies to assess this relationship. Some have been clinical based and others have used standardized scales.

Standage and Fenton (1975) used the Present State Examination (PSE) in 27 patients of epilepsy in a comparison of the mental state of patients with epilepsy and matched controls with locomotor disorders and found that somatic symptoms of depression occurred in 60 per cent of the epileptic group and in only 30 per cent of control subjects. A depressed mood was the most common symptom in the patients with epilepsy, occurring in 75 per cent.

Bear and Fedio (1977) used their own rating scale of 18 trait taken from the literature which were supposed to characterize the personalities of patients with temporal lobe abnormalities. They reported more self-rated depression in patients with epilepsy compared with a control group with neuromuscular disorders and a normal adult sample.

Roy (1979) assessed a consecutive series of 42 patients with epilepsy admitted to the hospital for neurosurgical or neuropsychiatric investigations and treatment of epilepsy. Author employed Hamilton Depression Rating Scale
(HDRS) to assess the depression and reported that 23 (55.00%) patients had an HDRS score $\geq 9$.

Trimble and Perez (1980) used the Middlesex Hospital Questionnaire/Crown-Crisp Experiential Index (CCEI) to assess the phenomenology and frequency of psychopathology in a group of 281 non-psychiatrically selected patients with epilepsy admitted to an epileptic centre for evaluation of their seizures or for rehabilitation. The group as a whole was found to have higher anxiety and depression scores than a normal control population. The mean depression score being equivalent to that found in psychiatric populations. This study did not observe any significant relationship between type of epilepsy and depression.

Kogeorgos et al. (1982) examined a group of 66 patients with epilepsy attending a neurological outpatient clinic using the CCEI and the General Health Questionnaire (GHQ). The scores were compared with 50 controls from previously published reports. The psychiatric morbidity in the epileptic group was reported to be significantly elevated, with 45.5 per cent of the index sample emerging as probable cases on the GHQ compared with 28 per cent of neurological controls and 21.6 per cent of a random community sample. In the 'cases' depression was particularly frequent and the depression scores of the cases on CCEI were significantly higher than those of non-cases.

Whitman et al. (1984) conducted a literature search locating all published MMPI reports of patients with epilepsy. Those with other neurological disorders and those with non-neurological chronic physical disorders. Results suggested that those with epilepsy run a higher risk for psychopathology, than members of general population but did not find any significant difference
between epileptics and those with other chronic illness and individuals with neurological conditions were demonstrated to be at significantly greater risk for psychopathology as compared to epileptics and patients with chronic illnesses.

Edenh and Toone in 1985 studied 82 patients with epilepsy taken from general practices by using the Clinical Interview Schedule (CIS) and noted 24 per cent to suffer from an affective disorder. 19 patients were diagnosed as depressive neurosis and one as affective psychosis.

Some studies have specifically selected depressed patients with epilepsy to examine the nature of depressive psychopathology, e.g. Mendez et al. (1986) compared 20 depressed patients with epilepsy with 20 depressed patients without epilepsy. The HDRS, BPRS and a locally designed questionnaire showed patients with epilepsy to have significantly fewer neurotic traits and significantly more psychotic feature and also reported that they were less likely to have family history of depression.

Robertson et al. (1987) recruited a series of 66 patients with epilepsy referred to Department of Neuropsychiatry at National Hospital over two years who fulfilled Research Diagnostic Criteria (RDC) for depression. The HDRS and 2 self rating questionnaires BDI and LPD (Levine-Pilowsky Depression Questionnaire) showed them to be moderately depressed (mean BDI score being 24.85 and mean HDRS being 21.88). The majority (60%) were classified as non-endogenous on the NDI (Newcastle Depression Inventory) and LPD. The predominant clinical features of the depression were reported as high state anxiety, high neuroticism and high hostility, especially evident on the intropunitive scores of self-criticism and guilt.
Vicetroff et al. (1990) studied 47 patients of Complex Partial Seizures diagnosed on basis of Video/Sphenoidal EEG telemetry demonstration of ictal epileptiform discharge from a specialist unit and used DSM III-R to classify their psychopathology and reported interictal depressive spectrum disorder in 62 per cent and 38 per cent met the diagnostic criteria of major depressive disorder. Altshuler et al. (1990) reported depression in 35 per cent patients in the sample of 75 patients with epilepsy by using Beck’s Depression Inventory and STAI (Spielberger State-Trait Anxiety Inventory).

Strauss et al. (1992) used Beck’s Depression Inventory in a sample of 84 patients of Temporal lobe epilepsy taken from a specialist unit and reported depression in 40 per cent of the patients.

Robertson et al. (1994) carried out a controlled study. Sample consisted of 18 patients of temporal lobe epilepsy (out of 102 patients who were consistent with a probable diagnosis of TLE from screening of 2500 patients over 5 years). Two comparison groups were also selected. A sample of 18 depressed subjects meeting criteria of DSM III-R and 18 normal control subjects. Assessment was carried out using HDRS, BDI, NDI, LPD, STAI, SRRQ (Social Readjustment Questionnaire), WPSI (Washington Psychosocial Seizure Inventory). Results showed that both HDRS and BDI scores were higher in depressed patients than in TLE patients who scored higher than the normal controls. Out of the 18 TLE patients 4 (22%) met DSM III R criteria for MDD and it was concluded that depressive symptomatology is significantly higher in TLE group than in a normal control sample and are thus in keeping with the notion that depressive symptoms are more common in patients with epilepsy than
in general population. And in this study most of the patients were classified as nonendogenous depression.

In a large community based study in UK, Jacoby et al. (1996) retrospectively examined the clinical course of epilepsy in an unselected population of people who had recent history of seizures or were receiving anti-epileptic drugs. Clinical information was collected from medical records and information about psychosocial functioning was obtained by means of postal questionnaire (Hospital Anxiety and Depression Scale, Impact of Epilepsy Scale, Life Fulfilment Scale, Stigma and Epilepsy Scale) sent to identified subjects. Overall 25 per cent of the patients were classified as anxious and 9 per cent as depressed. But the patients with frequent seizures had a diagnosis of anxiety disorder in 44 per cent and depression in 21 per cent.

**Laterality and Other Epilepsy Variables and Mood Disorders**

Ever since the relationship between mood disorders and epilepsy became more or less accepted. There has been various attempts by different authors to elucidate a link between emotional change and variables of seizures or epilepsy. Complex partial seizures have been believed to be associated with more psychopathology as compared to Generalized seizures probably a reflection of the role of temporal lobes. There has been a long standing controversy over the issue of laterality with some authors establishing more affective disorders with a certain hemisphere and others disagreeing to such phenomena. In the last few years there has been an increased interest in the role of frontal lobe in the emotional changes of epileptic patients. In addition to these some studies have also linked emotional changes to other variables of epilepsy like age of onset,
duration, frequency of seizure, control over seizure disorders, e.g. some of studies to be quoted here noted a decrease in seizure frequency prior to the onset of lowered mood (Flor-Henry, 1969; Betts, 1974; Standage Fenton, 1975; Dongier, 1959/60), whereas others found that depression was associated with an increase in seizures (Dodrill et al., 1986; Fenton, 1986).

Interpretation of the studies on the laterality issue may be more complex as suggested by recent EEG and neuroimaging findings e.g. Wylies et al. (1989) have demonstrated that interictal scalp recordings (which were used in many of the studies quoted) are only accurate in 31 per cent of cases, ictal subdural recordings being accurate in 100 per cent ictal scalp recordings accurate in 44 per cent.

Flor-Henry (1969) was probably the first author to report difference in psychopathology based on laterality of the focus. It was suggested that dominant side pathology (usually left sided) was more likely to be related to a schizophreniform presentation while a non-dominant (usually right sided) was associated with a manic-depressive psychosis.

Trimble and Perez (1980) using Middlesex Hospital Questionnaire/Crown Crisp Experiential Index in a study on 287 epilepsy patients did not observe any relationship between depression and epilepsy types.

Barraclough (1981) in a review of literature reported the risk of suicide in epilepsy on about 5 times the risk of general population but also observed that some of studies pertaining to TLE had risk as high as 25 times that of general population.

Perini and Mendius (1984) in order to evaluate the effect of lateralization of epileptogenic lesions on mood changes and anxiety assessed
twenty patients with complex partial seizures and 19 controls with depression scales (Beck, Columbia M-D) and the state and Trait Anxiety Inventory. Nine patients had left temporal foci, eight had right foci as assessed by the side of seizure onset during closed circuit television-EEG telemetry recording. Left patients scored significantly higher than both right and control groups on depression and trait anxiety (BDI: $X = 12.75$ in left group; 4.87 in the right group; 3.83 in the control group) suggesting that patients with left sided involvement seem more prone to experience dysphoric changes and depressive symptoms than those with right involvement.

Victoroff et al. (1990) studied 47 patients with medically intractable seizure (CPS). 38 per cent met DSM III-R criteria for major depressive disorder. There were no reported differences in depressive frequency by age, sex, or age at seizure onset. Anticonvulsant medication were a possible etiological factor in 6 depressions (21%). 60 per cent patients had lateralized EEG out of the 39 patients who underwent PET scanning 24 had lateralized temporal lobe hypometabolism. A higher proportion of patients with temporal lobe foci had a history of depression: 80 per cent (left) versus 50 per cent (right) based on ictal telemetry; 78 per cent (left) versus 47 per cent (right) based on PET suggesting that those with left temporal lobe foci may have greater vulnerability to depression.

Altshuler et al. (1990) studied the association between anxiety, depression and lateralization of an epileptogenic focus in 18 adult patients with a left temporal lobe focus, 21 with a right focus, 20 with bilateral temporal foci and 16 individuals with absence seizures. No significant difference in the level of anxiety was found among the groups, however, patients with a left sided
temporal lobe epilepsy scored significantly higher than other group on self ratings for depression and this could not be accounted for by other epilepsy variables.

Bromfield et al. (1990) performed a PET investigation on depressed and non-depressed patients with CPS. Five depressed patients with left temporal epileptogenic lesions were compared with five non-depressed with similar left temporal epileptogenic lesions with respect to temporal, frontal and subcortical metabolism. Analysis revealed a significant mood by region interaction, while mood by region-side interaction was non-significant, implying a non-lateralised regional difference. ANOVA for each of nine regions showed a significant difference between depressed and non-depressed patients in the inferofrontal cortex. Further analysis showed a highly significant inferofrontal hypometabolism for all depressed patients with epilepsy as compared with all non-depressed patients and age matched controls it was concluded that depression in patients with CPS appeared to be associated with a bilateral reduction in infero-frontal metabolism even in patients with well localised left temporal foci.

Hermann et al. (1991) examined the relationship between self reported depression and laterality of temporal lobe epilepsy and to determine the contribution of associated frontal lobe dysfunction in predisposing patients to depression. 64 patients with complex partial seizures of left (n = 26) or right (n = 38) temporal lobe origin were administered several self-report measures of mood state (Beck Depression Inventory, Centre for Epidemiological Studies Depression Scale, Beck Anxiety Inventory) and a test for frontal lobe function, Wisconsin Card Sorting Test (WCST). There were no overall differences
between the left (Mean BDI 8.1) and right (mean BDI 9.5) of temporal lobe groups on the measures of depression and anxiety. However, the left temporal lobe group exhibited a significant relationship between the degree of associated frontal lobe dysfunction and dysphoric mood state. These results: (1) implicated a relationship between depression and left temporal lobe dysfunction, (2) suggested that previous conflicting reports of depression and left temporal lobe epilepsy relationship are due in part to variation in the intactness of frontal lobe function, and (3) suggested that the presence of associated frontal lobe dysfunction may be a consideration in understanding interictal psychopathology in epilepsy.

Fiordelli et al. (1993)’s study on 100 patients with cryptogenic epilepsy and normal intelligence and 100 age and sex matched controls using clinical interview schedule (CIS) revealed that the psychiatric disturbances were associated with higher number of seizure types and polytherapy.

Septien et al. (1993) found depressive symptoms in 65 per cent of patients with left sided epileptic foci as compared to 45 per cent of those with right sided foci (P<0.01) and also noted that duration of epilepsy correlated with the development of depression.

Mendez et al. (1994) studied the issue of laterality and depressive disorder in secondary epilepsy. Among 1611 outpatients with epilepsy 272 patients were identified whose seizures originated from a structural brain lesion other than mesial temporal sclerosis. Sustained depressive disorders had occurred in 25 (9%) of these patients with secondary epilepsy. The depressed patients were compared with the remaining patients without depression with regard to location of lesion laterality and seizure variables. The only group
difference was unilateral left hemisphere lesions in 58 per cent of the patients with depression compared with only 21 per cent of the non-depressed patients \( (X^2 = 10.4, P = 0.0060) \) and hence suggested a relation of depression with epileptogenic lesions in the left hemisphere.

Perini et al. (1996) assessed psychiatric disorders by self-rating scales (BDI and State and Trait Anxiety Scales STAIX-1 and STAIX-2) and a structured interview (SADS) 20 patients with temporal lobe epilepsy, 18 patients with juvenile myoclonic epilepsy, 20 matched type 1 diabetic patients and 20 matched normal controls. Results showed that 11 (55.00%) patients with temporal lobe epilepsy had depression as compared with 3 patients with juvenile myoclonic epilepsy and 2 diabetic patients \( (p<0.001) \). Study concluded that patients with temporal lobe epilepsy have a higher incidence of Affective and personality disorders, often in comorbidity than patients with JME and diabetes suggesting that these psychiatric disorders are not an adjustment reaction to a chronic disease but rather reflect a limbic dysfunction.

Jacoby et al. (1996) in large community based study in U.K. observed that depression and anxiety scores are dependent on the frequency of seizures. Only 13 and 4 per cent were classified as anxious or depressed respectively among individuals who were seizure free as compared to the group having frequent seizures (1 or more/m) where 44 and 21 per cent respectively were classified as anxious or depressed.

Schmitz et al. (1997) with the aim to assess the relationship between psychopathology and specific distribution of cerebral perfusion investigated 40 consecutive patients referred for management of the focal epilepsies. The laterality was established on the basis of EEG (including ictal EEG in about half
the patients) and MRI findings. All forty patients had SPECT performed with Tc-HMPAD in addition to patients received a psychiatric evaluation with the following questionnaires BDI, Leyton Obsessionality Inventory, the Bear-Fedio Questionnaire and the social stress and support interview. Nine were excluded from study because of unilateraled epilepsy (n = 4), left or ambidextrous handedness (n = 4) and poor quality scans (n = 1). Results showed that there are no overall differences between left and right epilepsy groups on measures of psychopathology (mean BDI : Right sided epilepsy 12.6; Left epilepsy 8.3 P value 0.38). Specifically for patients with left sided epilepsy, higher scores on BDI were associated with lower contralateral temporal and bilateral frontal perfusion, and higher occipital perfusion. These results supported the view that certain psychopathological symptom patterns are related to specific regional dysfunction depending on the laterality of a hemispheric lesion rather than lateralised epileptogenic lesions as such.

Suicide/Attempted Suicide in Epilepsy

"Suicide although not a certainty is often a probable indication of a morbid family tendency and some weight must be given to it as an indication of a disposition to disease of which epilepsy may be a result even when it has an immediate exciting cause" - W.Gowers (1901).

Risk of suicide and attempted suicide can be assessed by some reports on these topics over the years.

Prudhomme (1941) conducted a postal survey of institutions and private physicians in the USA with the aim to find the suicide rate in epilepsy. Though most of the private physicians reported no suicide on their
questionnaires, a reply that the author was sceptical of; 22 institutions reported suicide. Based on this study author concluded suicide rate for in-patients as 46 per 100,000, five times higher than general population rate of 9.7.

Dalby (1969) followed up for a period of 4 to 16 years, the patients with paroxysms of two to five per second spike wave or polyspike wave activity investigated at Aarhus Hospital, Denmark between 1949 and 1959. They were exceptionally young, only 111 were 15 years and over. At follow up, 10 people had died, two from suicide giving a rate much higher than the expected value of 0.2.

Stepien et al. (1969) carried out a follow up study of the 77 patients treated for temporal lobe epilepsy in Warsaw between 1960-1968, for between 1 to 9 years. In this group excluding the post-operative deaths and those from malignancy, there were three deaths, of which one was from epilepsy and two from suicides.

Henriksen et al. (1970) compared the mortality of patients with epilepsy with the mortality of 1st class lives insured with Danish Life Insurance companies. The sample comprised all patients discharged from Neurological Clinics between 1950 and 1964 with the diagnosis of epilepsy. Patients with intracranial tumours and handicaps were excluded. The sample comprised 2763 patients who had been exposed to the risk of death for more than 25 years. There were 104 deaths. 21 were from suicide, three times the seven expected, the expected value was calculated from the mortality experience of insured lives.

Currie et al. (1971) reported 54 deaths in a sample of 666 patients diagnosed as having temporal lobe epilepsy at the London Hospital between 1946-67. Of these 54 deaths, 42 were epilepsy related. Of the remaining twelve
three or 25 per cent were suicides, while the expected value was approx. 0.3.

Zielinski (1974) studied 6710 epileptics in Warsaw. These were followed up for approximately two years during which time there were 218 deaths, of which 16 were from suicide as against an expected value of 2 calculated from the mortality of Warsaw.

Taylor (1977) in a follow up study of the people with temporal lobe epilepsy treated by surgery between 1952 and 1971, discovered 37 deaths. Nine were suicides, and two in circumstances suspicious of suicide. Suicide was the largest single cause of death and victims were young, aged between 30 and 40. Three of the nine were under 20. Interestingly, five patients had no fits post-operatively.

In a convincing study White et al. (1979) reported an enquiry into the mortality of patients treated at Chalfont Centre for Epilepsy. 1980 patients were followed for between 6 and 27 years and their mortality compared with expected values derived from English life tables. Of 425 deaths, 21 were from suicide; the expected value was 3.9.

Mackay (1979) in a study of 3733 self poisoning patients who presented on 4121 occasions at Glasgow Western Infirmary as medical emergencies from 1972 to 1976, observed 130 epileptics (3.5% of total) who had presented on 171 times. Taking the incidence of epilepsy in general population as 0.5 per cent, self poisoning occurred 7 times more commonly than expected. Repetition of self-poisoning was commoner in epileptics (18.5%) as compared to non-epileptics (7.0%). In this study, 67 per cent of epileptic patients poisoned themselves with their current antiepileptic drugs and 15 per cent administered a cocktail of antiepileptic and other drugs.
Barraclough (1981) reported risk of suicide in people with epilepsy 4 to 5 times greater than general population, while those with Temporal lobe epilepsy may have an increased risk of approximately 25 times that expected.

Brent (1986) reported people with epilepsy make more attempts (15.8 times more frequently), make medically more serious attempts, show more premeditation and have higher suicidal intent than do non-epileptic attempters.

**Epilepsy and Psychosocial Factors**

It has been suggested that psychosocial factors related to epilepsy may have a role to play in the mood disturbances in the patients. Epilepsy is still a disease which arouses complex attitudes among parents, peers, teachers. Although public attitude has been changing favourably and general knowledge about epilepsy among people has been increasing, it is not easy for an epileptic person to see that this is so. The diagnosis of epilepsy produces an emotional trauma which requires an adjustment and many frequently report of stigma and social prejudice.

Danesi *et al.* (1981) interviewed adult/adolescent epileptic patients attending a neurological clinic about their social problems and observed that substantial number had school problems, lost income, friends or spouses and a few had withdrawn from social activities. It was concluded that most problems arose from poor seizure control, due to poor compliance with anticonvulsant medication. Danesi (1984) subsequently found that approximately one-third of patients, despite having seizure were unable to accept a diagnosis of epilepsy and of those who were prepared to accept the diagnosis 2/3rd were not willing to disclose the fact to others.
Beran and Read (1981) reported how patients with epilepsy attending a neurological clinic saw their condition, their role in society and society’s expectations of them. The majority thought that people with epilepsy had more emotional problems and mood swings compared with those without, and there was a trend for people with epilepsy to consider themselves less well endowed with many positive attributes.

Dodrill and colleagues (1984) evaluated psychosocial problems among adults with epilepsy in a national study using the self-rating Washington Psychosocial Seizure Inventory (WPSI) and documented that emotional, interpersonal, vocational and financial concerns were commonly found as well as problems coping with epileptic attacks.

Arnston et al. (1986) investigated psychosocial consequences of having epilepsy and found that the epilepsy sample differed from controls. The stigma scale was significantly and positively related to perceived helplessness, depression, anxiety and somatic symptoms and significantly negatively related to self-esteem and life satisfaction.

Scambler and Hopkins (1986) described the difference between real and perceived stigma in social constraints. The difference between a patient’s self-perception with epilepsy and without epilepsy was found to be an excellent predictor of overall health related quality of life. This discrepancy is related to the degree of stigma felt by the patient and misconceptions about epilepsy which are more frequent at the onset of this chronic disorder. A group of patients with epilepsy scored significantly worse on scales of self-esteem, life fulfilment, social difficulty, physical symptoms, worries, and affect balance than a control.
group did. Seizure frequency was not the most important indicator of social distress, although better seizure control was correlated with well being.

Betts (1992) reported that although epilepsy may take place in the brain, it may profoundly influence the morale, well being, self image and lifestyle of its sufferers. Substantial number of patients report that the frequency of their seizure increases if they are exposed to stress. Epilepsy itself is stressful and many patients become afraid of their seizures, so that a vicious circle of fear begetting seizures and seizures begetting fear is set up.

Olsson and Campenhausen (1993) performed a long term follow up of 58 young adults aged 18-27 years with persisting absence epilepsies (AE) since childhood or early adolescence, to assess the psychosocial outcome. Results showed that more adolescents in the epilepsy group had interrupted their studies. Most of the epileptic persons held jobs requiring short training and about 62 per cent were over qualified for their jobs and they were significantly more socially isolated (e.g. of AE group 34.5% had no close friend as compared with 7.9% in the reference group). 74 per cent patients believed that their epilepsy had had or still exerted an impact on their lives in one or more of the following six respects: schooling, occupation, routines of daily life, leisure time activities, relation to friends and housing.

Cramer (1994) reported that data compiled by the Epilepsy Foundation of America show that people with epilepsy have higher rates of discrimination complaints filed with the Federal Equal Employment Opportunity Commission than do people with asthma, cancer, HIV and other neurologic disorders. Level of employment is far lower than qualifications and aspirations for many people...
with epilepsy as evidenced by a reduced level of vocational function in terms of both salary and status.

Kokkonen et al. (1997) evaluated social maturation and psychiatric morbidity in young adults treated for epilepsy during their childhood. Eighty one such cases were studied and compared with 211 randomly selected controls. Results showed that compared with controls the patients had more often not succeeded in passing the normal comprehensive school (20% vs 2%) or had left school at the secondary level (53% vs 46%) and remained without any vocational education (27% vs 11%). There was no significant difference in the employment status. The patients were significantly more often labelled with poor social maturation and dependent life style factors such as living with their parents. However, risk analysis showed that neither the disease itself nor the antileptic medication were significant predisposing factors for poor social adjustment but low or borderline mental capacity or learning disabilities relating to epilepsy were.

Review of Indian Literature

Chakraborty (1966) commented that attacks of epilepsy may be broken by explosion of affect either in the form of panic or aggressiveness or psychiatric symptoms such as depression and mounting state of irritability may occur as prodromal symptom of fits. Inter-ictal disturbances are common in epilepsy and epileptics are liable to sudden changes of mood by way of irritability, depression or elation and also emphasized the importance of psychosocial factors by reporting that adjustment problems and maladjustment exhibited by many epileptic children and adults are probably produced less by the ravages of the
disease itself, than by derogatory attitude of parents, siblings, playmates, neighbours and the ill advised and misdirected treatment or maltreatment to which many epileptics may be subjected by their associates and caretakers because of lack of understanding or prejudice.

Sikdar and Kar (1972) examined randomly selected 100 epileptics of 10 years and above in age, having grandmal type of seizure and compared with a matched group of equal number of non-epileptic persons. In the epilepsy groups 43 per cent were emotionally unstable as compared to 12 per cent in non-epileptic groups but psychiatric diagnosis was made in 4 patients; 3 as neurotic and 1 psychotic. Neurotic group was dominated by obsessional manifestation and anxiety.

Bagadia et al. (1973) examined 180 patients of epilepsy in a psychosocial study over a period of one year. There was a preponderance of males (67%) in this study group (88.4% had grand mal epilepsy, 4.4% had grand mal with petit mal epilepsy, 2.7% had psychomotor, 1.8% had petitmal). Results showed that 44.2 per cent of the patients had below average educational performance and of the 67.8 per cent of the patients who had incomplete studies, 1/3rd terminated their studies due to epilepsy. 33.8 per cent of the patients were students, 26.6 per cent were unemployed of the employed 91.1 per cent had occupational stress. Of the 100 patients who had an aura 46 per cent were of psychic type. Emotions acted as an precipitating factor in 20.5 per cent of patients. 40 per cent of the patients had psychiatric disturbance. Neurotic depression was the commonest psychiatric disorder (15.6%). Anxiety state was recorded in 9 per cent, conversion disorder and endogenous depression each in 1.1 per cent and phobic reactions were noted in 0.5 per cent.
Shukla et al. (1979) studied psychiatric disorders in 62 patients with temporal lobe (study group) and 70 patients with grandmal epilepsy (control group), both diagnosed on the basis of EEG and found that neurosis occurred more in study group as compared to control group (37% vs. 16%), psychosis (19% vs 10%) and behaviour disorders (n = 11 vs n = 5) were also more common in temporal lobe epilepsy whereas epileptic personality occurred more frequently in grand mal epilepsy (n = 9) as compared to temporal epilepsy (n = 2).

Shukla et al. (1979) also reported that significant number of temporal lobe epileptics were hyposexual, 41.2 per cent of males and 37.5 per cent of females and also reported one case in the temporal group as hypersexual as compared to none in the other group.

Gupta and Yadav (1980) conducted a study on 116 epileptic patients aged 16 and above registered at OPD of the Agra Mental Hospital over a period of 3 years to assess the social adjustment. Results showed moderate impairment in 22.4 per cent and severe impairment in 23.3 per cent of the patients. More females (41.3%) had good social adjustment than male patients (30%) further results showed that social adjustment was impaired more in patients with mental subnormality and episodes of psychotic illness.

Shukla and Katiyar (1980) analysed the relationship between the psychiatric diagnosis and side of temporal EEG focus in 62 temporal lobe epileptics. Results showed that neurotics had right-sided temporal foci significantly more often (P<0.005) than left-sided. Whereas there was no observed relationship between laterality and diagnosis of normality, psychosis or behaviour disorder.
Shukla and Katiyar (1981) studied seventy cases each of temporal lobe epilepsy and grandmal epilepsy, both diagnosed electroencephalographically for incidence and phenomenology of neurotic disturbances. 37.1 per cent cases with temporal lobe epilepsy as compared to only 15.7 per cent in the control group manifested neurotic disturbances the difference being statistically significant. The most common syndrome in both the groups was neuroasthenic neurosis (30.8% of TLE and 36.4% of grandmal neurotics) characterized by symptoms like weakness, anergia, lassitude and persistent fatigue. The next most frequent neurotic syndrome was depressive neurosis (26.9% of TLE and 18.18% grandmal neurotics). Characterized by sadness, lack of interest in people and work, psychomotor retardation and sleep disturbances. The other neurotic syndromes were anxiety neurosis, hypochondrical neurosis and hysterical neurosis in that order.

Satyanarayana Swamy et al. (1986) studied one hundred and fifty patients with epilepsy who developed psychosis during the course of disease and registered over a period of 5 years at NIMHANS. The epileptic psychosis formed 4.4 per cent of all the epileptics. The psychosis was classified as mania in 6 per cent and depressive in 1.3 per cent. Premorbid personality was reported to be normal in 84.7 per cent of patients and family history of psychosis and epilepsy was present in 4 and 0.7 per cent patients, respectively.

Nizamie et al. (1995) carried out 16 channel EEG of all the consecutive manic patients presenting over a 2 year period at CIP, Ranchi and assessed them for significant EEG abnormalities. Results showed that of the 271 manic patients who had their EEG’s recorded during this period 35 were found to have definite EEG abnormalities mostly in the form of epileptiform discharges
and since transient sensory, cognitive and affective changes resembling those described in patients with complex partial seizures have been found in affective illness a relationship between the two was suggested.

Jagawat et al. (1998) with the aim to find out the prevalence and nature of psychiatric co-morbidity in epileptic patients (N = 84) and to compare it with matched bronchial asthma patients (N = 46), used GHQ-12 along with data regarding socio-demographic and seizure profile. Results showed that 71.42 per cent of epileptic patients had some psychiatric diagnosis (according to ICD-10) as compared to only 28.57 per cent from asthma group.

Moily et al. (1998) explored the prevalence and pattern of non-psychotic psychiatric morbidity in 130 epileptic patients attending follow up care at Neuropsychiatric extension Camps, NIMHANS, Bangalore. The study used a specially designed proforma and GHQ-28. In this group 88 per cent patients suffered from generalized seizures and rest had partial seizures. 33 per cent had significant psychosocial stressors and 8.5 per cent suffered from associated chronic physical illness. Results revealed that significant proportion of patients had severe depression (20.8%), anxiety (13.1%) and ill defined somatic symptoms (18.5%). There was a significant correlation between GHQ score and duration of illness, age of onset, diagnosis, associated stress and disability.