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A Study on Psychotropic Changes in Epilepsy. Evaluation and Regulation of Mood, Quality Of Life In Epileptic Patients

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ABSTRACT:
Background: The connection among psychiatry and epilepsy stays one of the points that have been persistently standing out in clinical writing since the time of Hippocrates. As of late, a few reports were distributed with respect to conceivable antagonistic mental impacts of antiepileptic medications.
This paper planned to audit mental introductions in people with epilepsy and the antagonistic mental impacts of antiepileptic prescriptions. The paper additionally momentarily talks about accessible treatment choices with regards of better psychotropic treatment choices.
Objectives:
To study the psychotropic changes in patients with Epilepsy and in patients taking Antiepileptic drugs, to evaluate and regulate the mood changes in Epileptic patients and to evaluate the QoL of epileptic patients in comparison to healthy persons.
Methodology: This is a prospective, open level, observational study carried out in the department of neurology of a multispecialty hospital. Patients between age group of 18 years and 70 years of either gender from in-patient and out-patient departments are included in the study. Demographic data, lab parameters and treatment details were collected from the patient case files. The QOLIE-31 questionnaire was collected to evaluate and assess the quality of life and patient counselling was done for mood regulation.
Results: This is a prospective, open level, observational study carried out in the department of neurology of a multispecialty hospital. Patients between age group of 18 years and 70 years of either gender from in-patient and out-patient departments are included in the study. Demographic data, lab parameters and treatment details were collected from the patient case files. The QOLIE-31 questionnaire was collected to evaluate and assess the quality of life and patient counselling was done for mood regulation.
Conclusion: Psychotropic results within the epileptic population are not the same and difficult to predict. A record of cerebral infection may be a threat for negative psychotropic results. Therefore, positive psychotropic consequences of Anti-Epileptic Drugs may be much less applicable to epileptic patients. Use of sedating doses and mixtures of AEDs which could cause impairment of cognitive and behavioural feature must be prevented.
KEY WORDS: Antiepileptic drugs, psychotropic changes, mood regulation, quality of life.

I. INTRODUCTION

Epilepsy is characterized by the occurrence of at least two unprovoked seizures with or without convulsions (i.e., aggressive, involuntary contraction[s] of voluntary muscles) separated by at least 24 hours, often with neurobiological, cognitive, psychological and social implications. A seizure results from excessive cortical neuronal discharge and is characterized by changes in electric activity. It is a category of brain disorders distinguished by repeated epileptic seizures.[1]Seizures are episodes which range from small to lengthy periods of intense shaking.[2] This can cause physical damage such as occasional bone fracture. In this disorder, seizures continue to occur and typically do not show underlying cause.[3] Individual seizures triggered by a particular cause such as toxicity are not known to reflect epilepsy.[4]

Epilepsy has a concentrated root in the brain; signs rely on the target location, locations where the discharges are distributed and postictal agitation in certain regions.
Epilepsy was categorized differently; main forms are listed below:

I. Generalized Common Epilepsy (Grand Mal Epilepsy):

A seizure takes place when the neural impulses of the firing cycle of the brain are suddenly very anomalous and highly aggressive, either within an isolated region of the brain or around the brain.[5]

(i) Generalised tonic-clonic seizures :

It is also known as GTCS, major epilepsy, grand mal seizures. Generalized tonic-clonic seizure includes disturbances in whole body. It is known as grandmal seizure. The terms seizure, convulsion, or epilepsy are all used for the GTCS together and in a frequent manner.

(ii) Absence seizures:

It is also known as minor epilepsy, petit mal. EEG displays typical pulse and wave pattern 3 cycles per second. Absence hallucinations include short, sudden lapses in consciousness. They're more popular in kids than in adults.[7]

(iii) Atonic seizures (Akinetic epilepsy):

It is characterized by unconsciousness which is triggered by unnecessary inhibitory discharges and relaxing of certain muscles. Patient may collapse. Atonic seizure is a form of generalized seizure that causes rapid muscle tone failure culminating in limping and collapsing to the ground.[8]

(iv) Myoclonic seizures:

Myoclonic seizures are distinguished by short, jerking muscle or community spasms. Sometimes they occur with atonic seizures and trigger sudden limpness of the muscle. A person feels a rapid rise in residual muscle tension. It is alike myoclonic jerk, in which there is sudden spasm while sleeping.[9]

II. Partial seizures

(i) Easy partial epileptic seizures (SPS):

Lasts for half minute to one minute. In certain instances, first convulsions are limited to a collection of muscles or specific sensation disruption, with no lack of control, based on the region of cortex participating in the seizure**.**

(ii) Severe incomplete hallucinations (CPS, temporal lobe epilepsy, psychomotor):

Abnormal and disturbed physical actions and purposeless gestures, mental shifts lasting 1–2 minutes coupled with awareness loss. The focal point of the epilepsy lies in the temporal lobe.

(iii) Simple partial or complex partial seizures secondarily generalized secondarily:

They are followed by loss of consciousness which evolves into generalized tonic-clonic seizures.

Etiology:

Both genetic and acquired causes may lead to Epilepsy. Established acquired causes involve severe trauma to the brain, stroke, tumors or any previous infection. The cause is unknown in about 60 percent of cases.

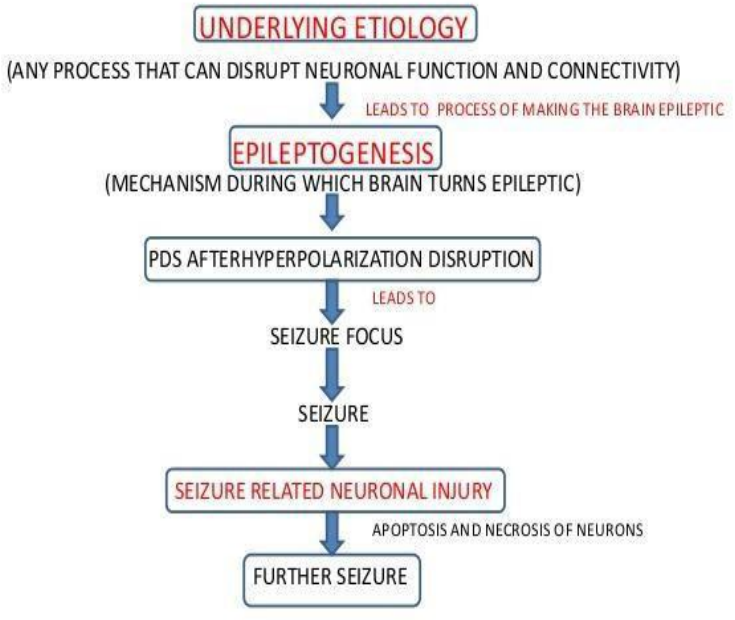

Fig. 1.1 Etiology Flowchart[10]

Pathophysiology:

Seizures are caused by excessive excitation or by disordered neuron inhibition. At first, a small number of neurons shoot off abnormally. Instead natural membrane conductivity and synaptic inhibitory currents break down, and excitability spreads locally (focal seizure) or more generally (generalized seizure).

A seizure occurs when normal equilibrium between excitatory neurons and inhibitory neurons is distorted. This Excitation and Inhibition imbalance may result from altered brain function.

Mechanisms which may lead to hyper excitability include:

1. Ion channel changes in neuronal membranes.
2. Biochemical receptor modifications.
3. Modulation of second messaging systems, and expression of genes.
4. Increases in concentrations of the extracellular ions.
5. In glial cells, changes in the production of neurotransmitters and metabolism.
6. Modification in the inhibitory circuit ratio and function, and
7. Regional imbalances between the major neurotransmitters (e.g., acetylcholine, serotonin and norepinephrine).[11]

Epilepsy:

The exact mechanism of epilepsy is unclear but its cellular and network functions are little understood. Nevertheless, it is unclear under what conditions the brain moves with its excessive synchronisation into the activity of a seizure.

One epileptic mechanism may be the up-regulation of excitatory circuits or downregulation of inhibitory circuits following a brain injury. Such secondary epilepsy happens by mechanisms known as epileptogenesis

Seizures:

During epileptic seizures a group of neurons start firing abnormally, rapidly, and synchronously. This results in a depolarization wave known as a depolarizing paroxysmal shift. Focal seizures originate in one hemisphere of the brain. Generalized seizures occur in both hemispheres. Gliosis, neuronal loss, and atrophy in specific brain areas are associated with epilepsy .It is unknown whether or not epilepsy induces such changes, or whether these changes contribute to epilepsy.[12]

Diagnosis:

Signs and symptoms, medical history, multiple diagnostic tests of epilepsy are used to determine the seizures cause. The evaluation may include the following:

• **A neurological examination**: Behaviour, motor skills, mental function and other areas to determine which form of epilepsy may be present.

• **Blood testing**: blood sample is used to test for signs of infection, genetic conditions or other seizure-related conditions.[13]

Treatment:

Choice of pharmaceutical drugs depends on epilepsy occurrence , medication-specific adverse effects and patient needs

• Monotherapy is introduced. Approximately 65% of patients may be held and managed on one AED, but they are not necessarily free from seizures.

• Up to 60% of epilepsy patients are incompatible; it's the most common cause of failure of treatment.

• Drug therapy may not be suggested in people who have had one or the least effects on their life. AEDs should usually be started for patients with two or more seizures.

• A seizure-free period 2 to 4 years, complete seizure control within 1 year of commencement, seizure on age 2 years and age 35, and a normal EEG and neurologic examination are all factors favouring successful withdrawal of AED. Weak prognostic factors include high-frequency convulsion history, recurrent status epilepticus, combination of convulsion sort and irregular mental function growth.[11]

Table 1.1 First-line Treatment of Epilepsy in Patients ≥ 13 Years[14]

Seizure Type	Adjunctive Options	Third Line
Focal	Carbamazepine, Gabapentin,Lamotrigin Levetiracetam, Oxcarbazepine,	Eslicarbazepine, Lacosamide, Perampanel, Phenobarbital, Phenytoin, Pregabalin,
Generalized tonic-clonic	Clobazam, Lamotrigine,	

	Levetiracetam, Topiramate, Valproate	
Absence	Lamotrigine	Clobazam, Clonazepam, Levetiracetam, Topiramate, Zonisamide
Myoclonic (including Juvenile myoclonic epilepsy)	Lamotrigine, Levetiracetam, Valproate, Topiramate	Clobazam, Clonazepam, Zonisamide

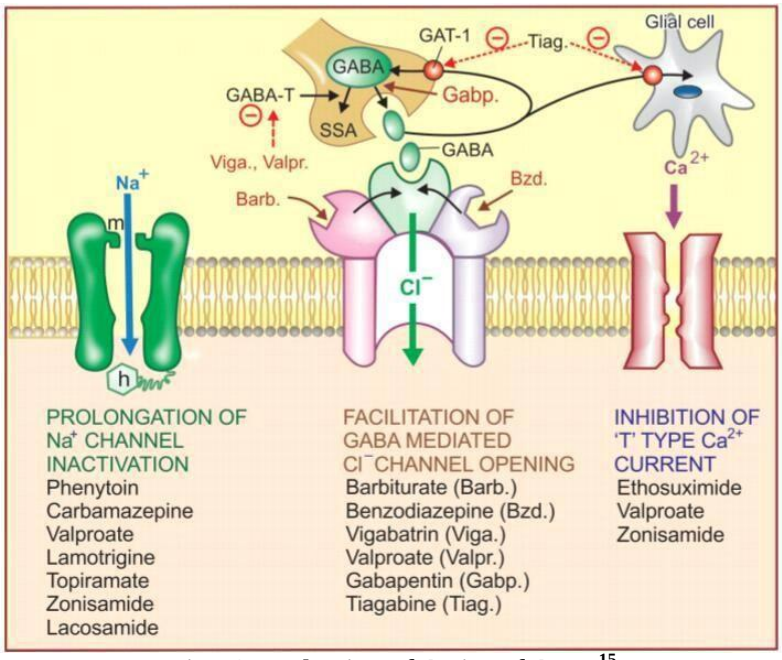

Fig.1.2 Mechanism of Action of AEDs[15]

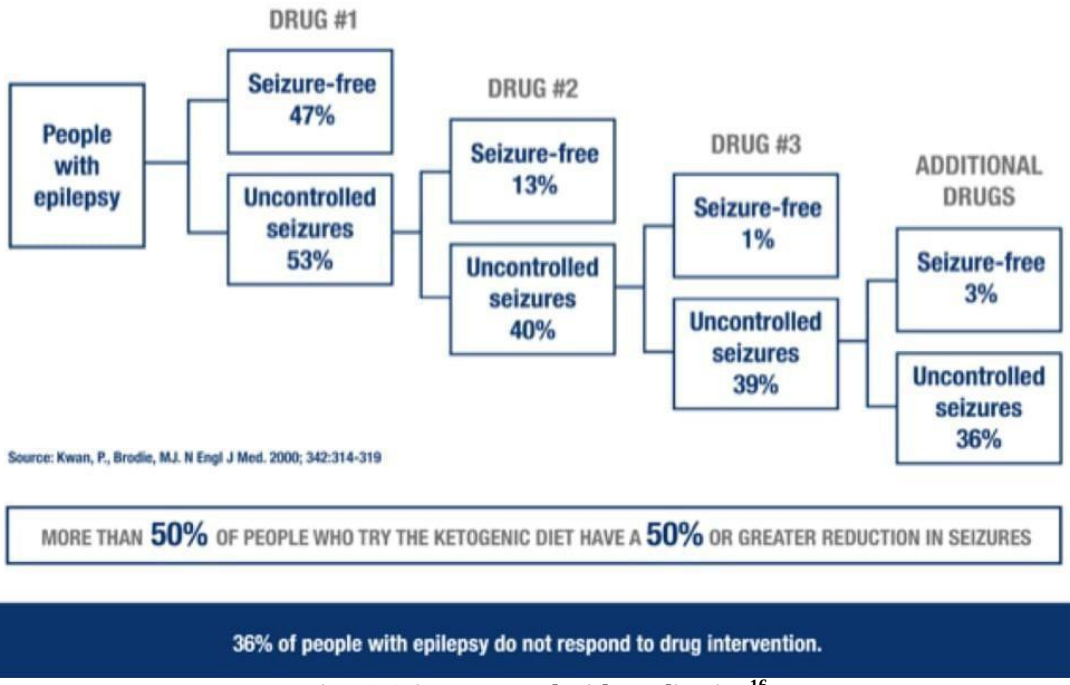

Fig 1.3 Seizure control with medication[16]

Table 1.2 Potential Psychotropic Effects of Antiepileptic Drugs [17]

Antiepileptic Drug	Positive Effects	Negative Effects
Barbiturates	Anxiety, mood stabilization, sleep	Aggression, impaired cognition and attention, Depression, irritability, sexual function and desire
Carbamazepine	Aggression, mania, mood stabilization	Irritability, impaired attention, aggression, confusion, depression, insomnia
Gabapentin	Anxiety,insomnia, socialphobia, mood stabilization	Irritability/agitation (usually in children with disabilities)
Lamotrigine	Depression, mood stabilization, mania	Insomnia/irritability (usually in children with disabilities)
Levetiracetam	Data not available	Anxiety, depression, irritability

II.OBJECTIVES

The objectives of this study are :
• To study the psychotropic changes in patients with Epilepsy and in patients taking Antiepileptic drugs.
• To evaluate and regulate the mood changes in Epileptic patients
• To evaluate the QoL of epileptic patients in comparison to healthy persons.
• Increased awareness among patients regarding the psychotropic changes due to epilepsy and due to antiepileptic drugs.
• To establish better patient understanding of anti epileptic drugs and to promote patient safety and well being

III.METHODOLOGY

Study design: This is a prospective, open level, observational study carried out in the department of Neurology of a multispecialty hospital(300 bedded hospital).

Source of data: Data from the patients admitted in the Department of Neurology was collected using patient data collection form designed to screen the patients who are presented with a complaint of abnormal sensory and motor behaviour..

Study procedure:

- Enrolling of patients for study after taking consent form
- Patients will be grouped according to the inclusion and exclusion criteria.
- Demographic details and other details will be recorded by using patient data collection form
- Patient will be interviewed specifically for fulfilment of the purpose of the objectives of this study
- Analysis will be done after the collection of statistical data
- Results will be interpreted after analysis of data
- Finally result will be concluded and impression will be highlighted

Duration of the study*:* The study was conducted for a period of 6 months.
Place of study*:* The study was conducted at MEDICOVER HOSPITAL.

Inclusion criteria:
• Patients of either gender with final diagnosis of epilepsy.
• Patients between the age group of 18 and 70 years.
• Patients with epilepsy of idiopathic origin.
• Patients with history of mild trauma

Exclusion criteria:
• Patients with tumor.
• Patients with bleeds or any such organic cause.
• Patients with electrolyte disturbances
• Patients who are alcoholic
• Patients of age less than 18 years and more than 70 years

IV. RESULTS

1. Gender-wise distribution of cases:

In this analysis there was a predominance of male patients although there was no statistically significant association between seizure and the frequency of male patients.

Table 4.1 Gender-wise distribution of cases.

Gender	No.of cases
Male	**47 (58.75%)**
Female	**33 (41.25%)**

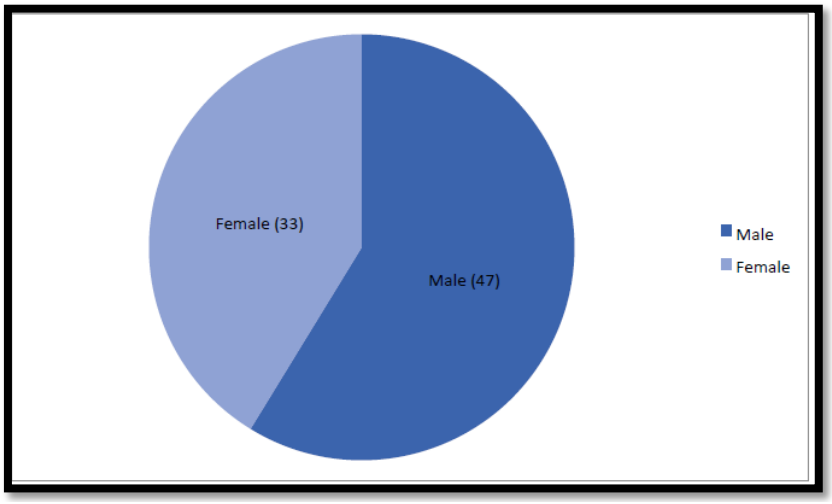

Fig 4.1 Distribution of study population based on gender

2. Age-wise distribution of cases

In the study group, the average age was 40.5 and no association was found between occurrence of seizure and increasing age group.

Table 4.2 Age-wise distribution of cases.

Age	Percentage of patients
18-30	14 (17.5%)
31-50	38 (47.5%)
51-70	28(35%)

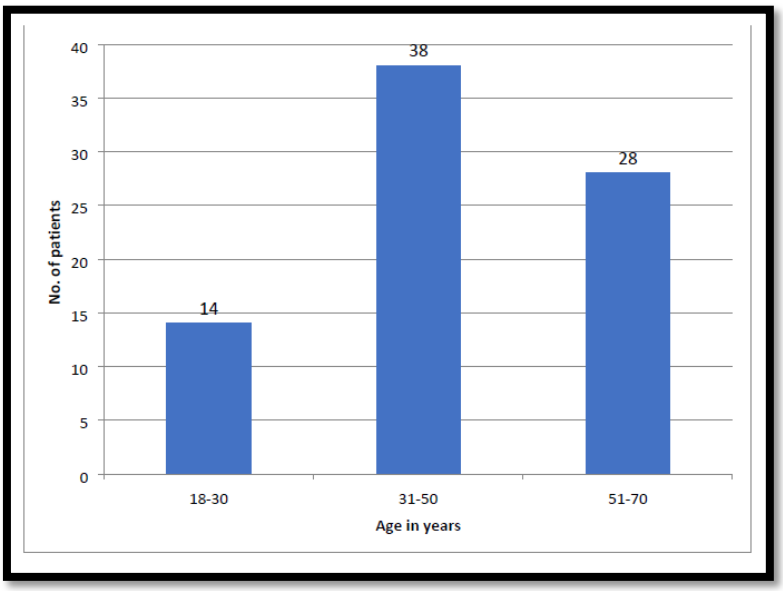

Fig 4.2 Distribution of study population based on age

3. *Seizure type wise distribution of cases*

Table 4.3 Seizure type wise distribution of cases

Types of seizures	No. of cases
Focal seizures	**18 (22.5%)**
GTCS seizures	**26 (32.5%)**
Absence seizures	**10 (12.5%)**
Atonic seizures	**14 (17.5%)**
Myiclonic seizures	**7 (8.75%)**
Status Epilepticus	**2 (2.5%)**
Pseudoseizures	**3 (3.75%)**

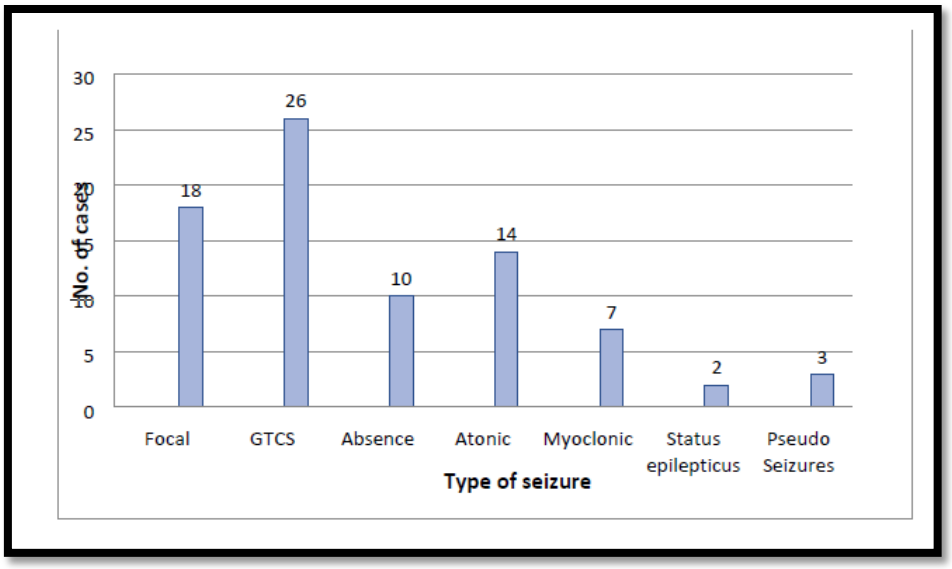

Fig.4.3 Distribution of study population based on type of seizure

4.Evaluation of parameters

Table 4.4 Evaluated parameters among the study population

Evaluated parameters	No.of cases
Psychotropic changes	58
Physical changes (worn out)	23
Social limitations	15

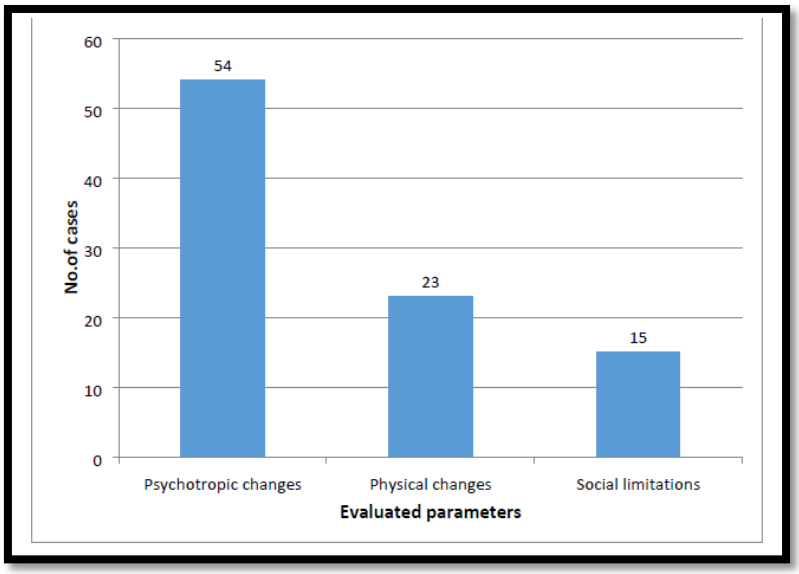

Fig.4.4 Graphical representation of incidence of evaluated parameters in the study population

5. Psychotropic changes

Table 4.5 Psychotropic changes evaluated in the study population

Psychotropic changes	No.of cases
Aggression	18
Mental disturbances	11
Depression	15
Drowsiness and headache	25
Confusion	22

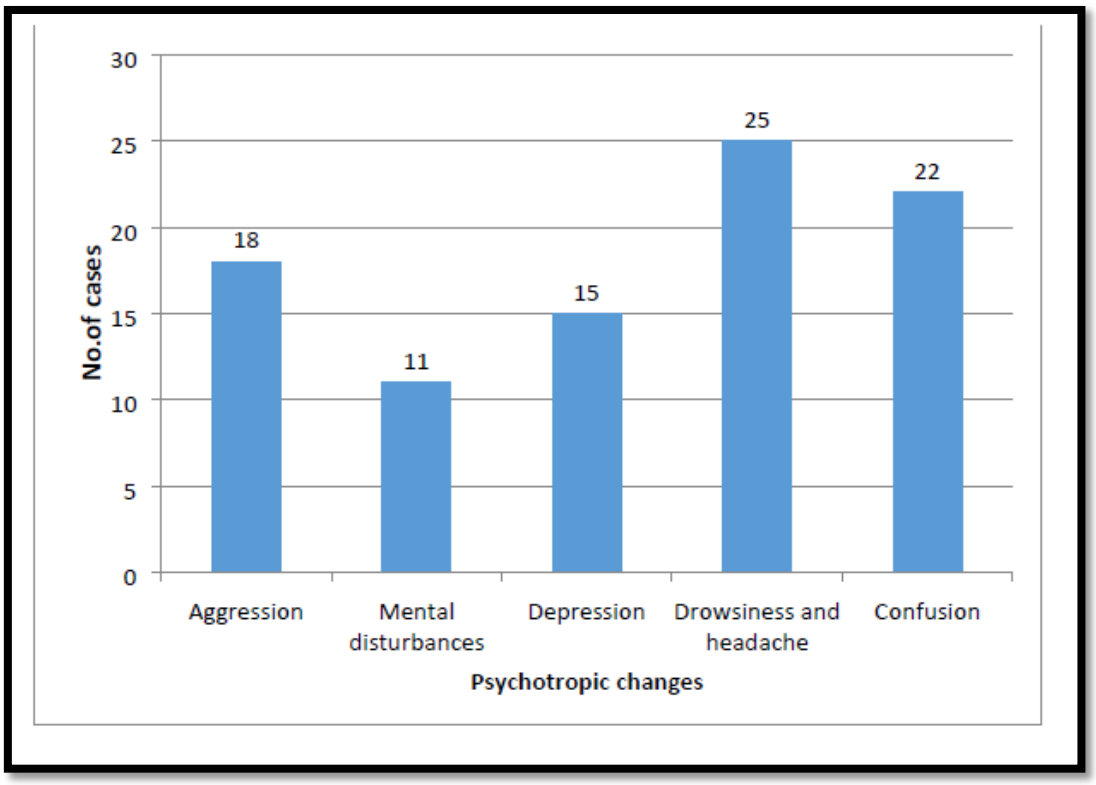

Fig 4.5 Graphical representation of no. of cases with psychotropic changes

6. *Quality of life:*

Table 4.6 Changes observed in the quality of life of epileptic patients

Quality of life	**No.of cases**
Improved	**51 (63.75%)**
Remained same	**29 (36.25%)**
Total	**80**

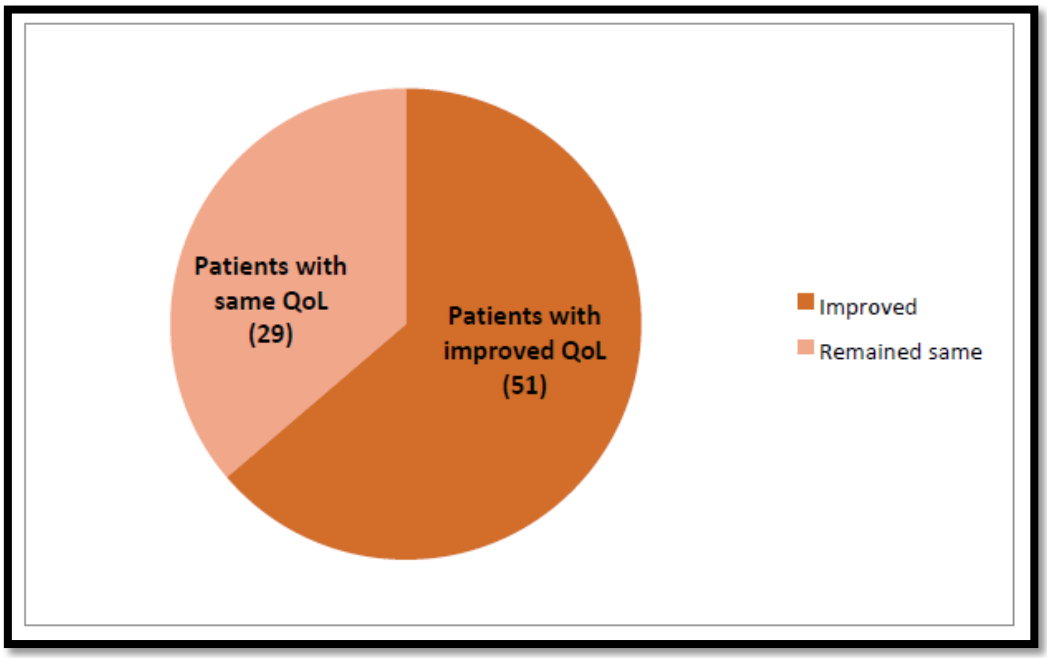

Fig 4.6 Changes in the Quality of Life of patients under the study population

V. DISCUSSION

- In our study, from a total of 80 cases collected,14 patients were of age group between 18 and 30 years;38 patients between 31 and 50 years and 28 patients between 51 and 70 years. There was no association found between occurrence of seizures and increasing age.

Another study reported the prevalence and incidence of epilepsy are highest in later life with around 25% of new cases occurring in the elderly people many of whom have cerebrovascular, neurodegenerative or neoplastic disease.[18]

- Our study showed a predominance of male patients. A total of 80 cases were collected out of which,33 were female patients and 47 were male patients. Gender can be a factor in how epilepsy will affect a particular person. In many ways, the occurrence of epilepsy is different for a woman than a man. Various published studies indicate that females have a marginally lower incidence of epilepsy and unprovoked seizures than males.[19]

- In this study,the distribution of seizure type was done .22.5% patients had partial seizures,32.5% had generalised seizures and 17.5% had absence seizures.In an epidemiological survey, the distribution of seizure type was investigated in 1,220 patients.56% of patients presented with partial seizures and 26.5% with generalized seizures. [20]

- Psychiatric comorbidities are common among patients with epilepsy. In our study, drowsiness was found to be the most common psychiatric effect -31.25% followed by confusion - 27.5%,aggression - 22.5%,depression-18.75% and mental disturbance 13.75%.A recent study including 319 patients suggested that depression was found to be the most likely seen diagnosis observed in 32.6 % of patients.[21]

VI. CONCLUSION

Out of the total cases assessed, 47 were male patients and 32 were female patients. Male predominance was evident in the study although there was no statistically significant association between presence of seizure and gender. The most common age group that had been admitted was found to be between 31-50 years. In this study group, the average age was 40.5 and no association was found between presence of epilepsy and increasing age group.

The effects of antiepileptic drugs were categorized into:

• Psychotropic changes - observed in 54 cases
• Physical Changes - observed in 23 cases
• Social Limitations – observed in 15 cases.

Among all the psychotropic changes it was found that there were increased number of cases with drowsiness and headache [25], followed by cases of confusion [22], aggression [18], depression [15] and mental disturbance [11].

The change in the Quality of Life in patients taking antiepileptics was evaluated using QOLIE-31 Questionnaire. It was concluded that 63.7% of the patients showed improved Quality of Life and 36.25% showed no change in their Quality of Life .

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