



ASSESSMENT OF COGNITION BETWEEN EPILEPSY PATIENTS WITH NORMAL HEALTHY VOLUNTEERS – A COMPARATIVE STUDY

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ABSTRACT

Background: The objective of the proposed study was an Assessment of adverse effects of anti epileptic drugs through the patient medication interview and Assessment of Cognitive impairment. **Materials and Methods:** The total number of epileptic patients (ambulatory patients) were interviewed in the study site during the study period were found to be 114. **Results:** According to MMSE, Epilepsy patient found to have significant ($p < 0.001$) cognitive impairment while compared with the normal healthy volunteers. **Conclusion:** Patients with epilepsy and/or anti-epileptic therapy affect cognition. So the pharmacist can play a pivotal role in the management of epilepsy by monitoring the adverse effects, cognitive level by providing the guidelines to educate and motivate the patients regularly.

KEYWORDS: Epilepsy, Cognition, Patients, Adverse effects.

INTRODUCTION

The epilepsies are the common and frequently devastating disorders, WHO estimates that eight people per 1000 worldwide have this disease. The prevalence of epilepsy in developing countries is usually higher than in developed countries it affecting approximately 2.5 million in USA alone. Over half of the 50 million people with epilepsy worldwide are estimated to live in Asia.^[1] It is estimated that there are 55, 00,000 persons with epilepsy in India.^[2]

Epilepsy has a prevalence of approximately 500,000 cases per 50 million persons worldwide. In the United States, the prevalence of epilepsy is 6.42 cases per 1000 people. The onset of seizure is greatest during the first year of life; this probability decreases each decade after the first year until age 60. Approximately, 1 of 50 children and 1 of 100 adults are affected. Approximately, 70% of epileptic have only one seizure type; the remainder has two or more seizure types. The incidence has been estimated at between 20 to 70 cases per 100000 persons and cumulative incidence at 2-5%. The incidence is higher in the first two decades of life but fall over next few decades only to increase again in last life.^[3]

Adverse effects of antiepileptic drugs are considered by patients to be at least as important as repetitive seizures in terms of quality of life. AEDs (Anti epileptic drugs) toxicity is frequent and contributes to a high proportion of treatment failures. Despite its high prevalence and

clinical relevance, screening for adverse effects to antiepileptic drugs is not systematically induced in everyday clinical practice. Acute adverse events are probably, the most frequently recognized by patients and physician, since it occurs with almost every AEDs that are highly predictable and dose dependent. The most common adverse events include somnolence, dizziness, ataxia, diplopia, blurring of vision, fatigue, vertigo, and cognitive dysfunction.^[4]

Cognitive impairment is a frequently occurring secondary consequence of epilepsy. Cognitive function is higher-order behavior involving the capacity of the brain—specifically of the cortical structures—to program adaptive behavior, to solve problems, to memorize information, and to focus attention. The exact cause of cognitive impairment in epilepsy has not been explored fully, but three factors clearly are involved:

- Etiology of epilepsy
- seizure Activity
- Central nervous system side effects of drug treatment.^[5]

Cognitive impairment is inducing difficulties to the physician in the antiepileptic drug therapy in terms of selection of drugs. Cognitive level and quality of life in patients, who were receiving antiepileptic drug therapy, were studied in the above said references on various international populations. So this study was planned to make an attempt to investigate a cognitive level of

epileptic patients in antiepileptic drug for the effective management of cognitive impairment in epileptic patients.

METHODOLOGY

Study site

50 bedded Private Neuro hospital, Erode, Tamilnadu, India.

Patient selection

Inclusion criteria: All types of epileptic patients (ambulatory patients). For control group normal healthy volunteer with similar age and gender matches with the patient population has been included.

Exclusion criteria: Epileptic with any other co-morbid condition like head injury, stroke, trauma, congenital malfunctioning, mental sub normality, Children (below 13yrs) and tumor were excluded from the study.

Study design

Prospective study.

Design of data entry format

A separate data entry format for incorporating patient details was designed. The format contains the details such as name, age, sex, height, weight, outpatient number, past medical history includes onset of disease, duration of treatment, and any alternative therapy followed, past medication history, education, social, and family history, marital status, lab investigation, diagnosis, compliance or non compliance drug chart commonly for all prescribed drugs.

Design of patient consent format

The consent from the patient was obtained before included in the study.

Design of patient interview format

A patient interview form was designed in order to enter a dose related adverse effect reported by the patients. In each interview, the reported adverse effect will be transferred into the patient interview format.

Design of MMSE format

The mini mental status examination (MMSE) or Folstein test^[6] is a brief 30 point question that test is used to screen cognitive impairment the format contains the details such as a patient name, questions for assessing orientation, registration, attention and calculation, recall, Language includes naming repetition, 3-stage command, reading, writing, copying.

Data collection

A regular ward round participation was performed daily with a physician in the study site. Patient details and adverse effects of anti epileptic drugs were monitored through the patient medication interview. The control (healthy volunteers) and epileptic patients were planned

to compare in terms of memory status and cognitive level in MMSE.

Analysis of data

The data collected from all types of epileptic patients through the designed data entry format during the medication interview were thoroughly analyzed to assess the cognitive impairment. Graph pad In stat prism 4.0 software package was used in the statistical analysis.

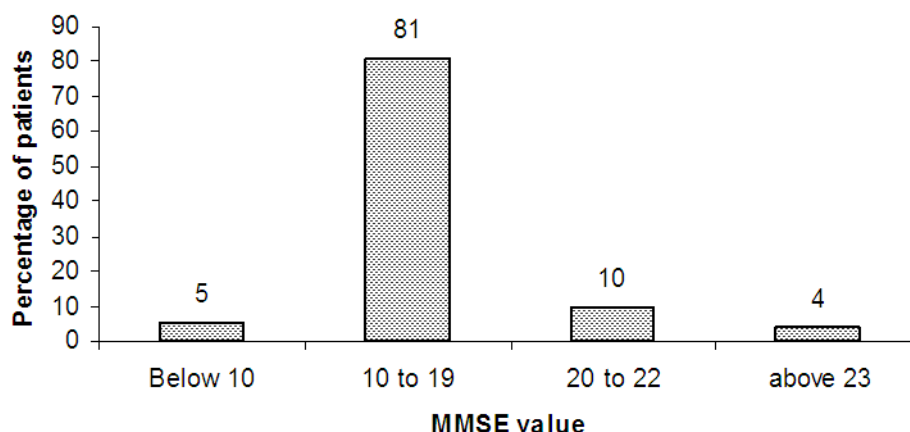
RESULTS

The study on cognitive impairment on epileptic patients was conducted as described in the methodology and following results were obtained. The total number of epileptic patients (ambulatory patients) were interviewed in the study site during the study period were found to be 114 and totally 50 healthy volunteer included in this study. The average age of the overall study population was found to be 26.74 ± 11.95 (13-65) years. An attempt to categorize the study population's age reveals that nearly half of the study population belongs to early adulthood (41%) followed by adolescents (30%), adulthood (22%) and late adult hood, etc. An attempt to categorize the study population's marital status was noted that the unmarried was predominant in study population. The physician of the hospital had performed a thorough clinical investigation and diagnosed the patient and such diagnosis was reported as types of epilepsy. The result shows that Patients with Complex partial seizure (24%) were extremely diagnosed at the study site followed by generalized tonic clonic seizure (18%), myoclonic seizure (14%) etc. Extremely prescribed antiepileptic drugs reveals Phenytoin (46%) is extremely prescribed antiepileptic drug followed by Sodium valproate (36%), Carbamazepine (32%), etc. Mini mental status of the patients was examined through the MMSE scale or FOLSTEIN test. The analysis revealed that 81% of the patients scored between 10-19 (moderate to severe cognitive impairment) followed by 10% scored 20-22 (mild cognitive impairment), 5% scored below 10 (severe cognitive impairment) and 4% scored above 23 (normal). The result was shown in **Fig. 1**. It statically correlates the level of cognitive impairment of epileptic patients using the mean, SD, paired test. P values <0.001 was accepted significance. MMSE data when compared to the control groups provides the highly significance reduction (p value <0.001) of MMSE. The report was given in **Table. 1**.

Table 1: Statistical Correlation for Cognitive level.

Parameter	Experiment	N	Mean	SD	t value	P value
MMSE	Control	50	24.50	2.573	17.753	<0.001*
	Test	50	15.70	2.517		

Paired 't' test; P<0.01 considered significant.

Fig. 1 MMSE (n =114)

Interpretation

- Any score over 27 (out of 30) is effectively normal
- Below this 23-26 indicates normal
- 20-22 indicates some cognitive impairments
- 10-19 moderate to severe cognitive impairment and

DISCUSSION

In this study cognitive level of a patient investigated by using the mini mental status exam and the report revealed that majority patients were scored below normal like 81% (10-19), followed by 17% (20-22). Similarly the investigation has been performed in healthy volunteers, and the results shows that everybody being with the normal cognitive level.

The results revealed that cognitive impairment might be due to after initiation of Anti epileptic drug treatment. The cognitive performance of the control group was better than the patients in the medication interview. The cognitive performance of the patients in this study was significantly poorer than the control group. P value <0.001 statically significance.

One study reported that the following factors have a predominant effect on cognitive function. The type of epilepsy influences the stable effects, which are those functions which require the accumulation of knowledge over long period of time. The type of epilepsy also influences mechanistic cognitive processes, memory or the effect caused by the alteration of the verbal memory, observed in patients affected by symptomatic focal epilepsy the concept of “subclinical epileptic activities”

or EEG discharges could be associated with “transient cognitive alterations”.^[7]

Despite the fact that the etiology of the epilepsy may cause cognitive disruption by itself, the contributory roles of various seizure variables need evaluation. This study showed an inconsistent pattern when effects of seizure frequency and epilepsy type on cognitive performance were assessed. The seizure frequency affected concentration ability but had no effect on mental speed, the lack of effect was noted when the simple reaction tasks were used to assess the (psychomotor) mental speed of the patients.^[8]

So, the patients should be monitored routinely in order to minimize the adverse effects and cognitive impairment and also to improve the quality of life. The guidelines provided in this study to the patients will be helpful in order to minimize cognitive impairment or improving memory status of epileptic patients.

CONCLUSION

This study recommends that a systematic and careful monitoring of adverse events should be performed in the management of epilepsy. So the pharmacist can play a pivotal role in the management of epilepsy by monitoring the adverse effects, cognitive level by providing the guidelines to educate and motivate the patients regularly.

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