

Assessment of seizure attack and associated factors among epileptic patients on follow up at Jimma University medical center outpatient.



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Jimma, Ethiopia

Assessment of seizure attack and associated factors among epileptic patients on follow up at Jimma University medical center outpatient

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Abstract

Back ground: Epilepsy is one of the common chronic neurologic disorders characterized by recurrent seizure that is a brief period of uncontrolled involuntary movement. In 2008, globally there were 50 million patients with epilepsy from which 80% are in developing world. In Ethiopia, the reported prevalence of epilepsy was 5.2 per 1000 people in the country. It has been reported that the annual incidence of epilepsy was 64 in 100,000 inhabitants at risk, 72 for males, and 57 for females in Ethiopia. Patients with epilepsy may continue to experience any types of seizure while getting antiepileptic drugs (AEDs) treatment.

Objective: To assess the magnitude of seizure attack and associated factors among patients with epilepsy on follow up at JUMC OPD.

Method: A facility-based cross-sectional study was conducted. A total of 401 epileptic patients on follow up were enrolled through systematic sampling method. Data were collected by trained nurses using semi-structured interviewers administered questioners and reviewing secondary data. Before entering in to a computer, the data were cleaned and coded using Epidata 3.1 and analyzed using SPSS version 23. A descriptive statistics was used to present the data. Odds ratio were computed to assess the presence and degree of association between dependent and independent variables. Logistic regression analysis was carried out to see independent effect of each variable on the outcome

Result: Total of 401 respondents were interviewed. Overall, 42.6% (n=171) of respondents were experienced seizure attacks. Patients with longer duration of epilepsy were less likely to have seizure episode compared to those patients with shorter duration of epilepsy (more than 10 years vs less than one year) [AOR=0.21, 95%CI: 0.049-0.770, p=0.032]. The odds of seizure episode was 3.5 times higher among patients with multiple therapy as compared to patients with monotherapy modality [AOR=3.5, 95%CI: 1.31-9.40, p=0.012].

Conclusion and Recommendation: More than one-third of respondents experienced seizure attacks while in the course of AED treatment and follow up. Duration of treatment and the number of drug used were factors independently associated with seizure attacks. Strengthen treatment modality is crucial. Further, longitudinal prospective studies are also needed to fully understand the nature of these factors in seizure attacks.

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LIST OF ABBREVIATIONS

ACSH-Ayder College Specialized Hospital

AED-anti-epileptic drug

DR-doctor

JU -Jimma University

JUMC- Jimma University medical center

JUSH -Jimma University Specialized Hospital

KM-kilometer

MD- medical doctor

OPD-outpatient department

SPSS-

TASH-Tikur Anbessa Specialized Hospital

CHAPTER ONE

Introduction

1.1 Background

Epilepsy is one of common serious chronic neurologic disorder characterized by recurrent seizure that is a brief period of uncontrolled involuntary jerky movement. About 10% of the entire world populations expect to experience at least one epileptic seizure during life span.

There are about five million people diagnosed with epilepsy worldwide annually. There were 50 million people around world with epilepsy in 2008 of whom nearly 80 % are in low- and middle-income countries(1–3). About three quarter of people with epilepsy in Africa do not receive appropriate treatment for their problem despite the fact that highly cost-effective treatments are available(4,5).

In Ethiopia, the prevalence of epilepsy was found to be 5.2 per 1000 people in the country(3) and the annual incidence of epilepsy was 64 in 100,000 inhabitants at risk, 72 for males and 57 for females(3,6).

The whole purpose of managing epileptic patient is to make them seizure-free state but in spite of anti-epileptic treatment, some patients may continue to experience seizure. Antiepileptic drugs (AEDs) are the standard for treatment of epilepsy, but only around 70% of patients may achieve seizure remissions(7–9). Patients with epilepsy may continue to experience any types of seizure, despite getting antiepileptic drugs (AEDs) treatment in 30% of cases(10).

It is known that epileptic patients usually have poor health including psychological distress, depression, anxiety, and employment restriction(7,8). People with epilepsy are at higher risk of having physical problems related to seizure(11). Epileptic seizure usually causes negative social effects which subsequently result in poor quality of life(12,13).

Depression and perceived stigma is proportional to number of seizure frequency which further impact the social life of patients and deteriorate patients' quality of life(14,15).

The risk of early death attributed to epilepsy is two to three times higher than the general population. It can even reach as high as 4–7 times in people with uncontrolled seizure and its

effect is worse in developing countries with the highest rates of premature mortality found in low- and middle-income countries and in rural areas(3,8).

1.2 Statement of the Problem

Magnitude of seizure attack among epileptic patient on medication found to be more than 50% in hospital based study in Gondar University(8). An institution-based cross-sectional study was carried out on 291 patients with epilepsy attending the neurology clinic of TASH showed (191, 65.6%) of the study participants had uncontrolled seizure. Another study in Jima specialized hospital found out that from 290 epileptic patients, 165 (56.7%) patients were seizure free and 125 (43.3%) were not seizure free during the 3 years follow-up.

Recurrent seizure episode is found to significantly affect patient social, psychological, economical and even physical injuries in life. Some of the factors attributed to increased frequency of seizure episode include no adherence to antiepileptic drugs(16,17).

Recurrent seizure attack is big burden, but a little is known about frequency of seizure episode among epileptic patient and associated factors. It was therefore important to determine the incidence of seizure episodes and the possible precipitating modifiable factors among patients with epilepsy in jimma hospital because understanding cause of seizure recurrence can assist clinicians to focus on monitoring treatment for susceptible patients.

Hence ,this study aimed at determining the frequency and modifiable precipitating factors of episode of seizures attack among known epileptic patients on anti-epileptic medications so that subsequent intervention and improving quality of life our patients in this hospital

CHAPTER TWO

2.1 Literature Review

Epilepsy accounts for 0.6% of all diseases globally, as a result of years of life lost due to early mortality and time lived with a disability. It has a significant economic effect in terms of health care costs and diminished productivity due to absenteeism(1).

There was a comprehensive survey done in UK from May-October in 1998 by means of a postal questionnaire distributed to people with epilepsy receiving AEDs. Out of 3455 unselected patients who were questioned by postal questionnaire, 1652 returned completed replies.

Accordingly, more than half of patients did not experience any seizure episode one year duration, 7.9% of them had one seizure episode and the remaining had two and more seizure attack in the same duration(13).

Hence, the result from this study showed seizure remain poorly controlled in up to half of people with epilepsy in UK with significant impact on work, family and social life and it was also found that there was clear differences in the clinical characteristics of epilepsy in older people and it appears that seizure tends to decrease with advancing age(13).

In the cross sectional study conducted in Mulago hospital in Kampala, Uganda from December to August 2009 among 256 patients found that 73.5% of patients had breakthrough seizure while they were taking anti-epileptic drugs. The identified provoking factors for seizure as to this study includes infections, menstruation, drug non-compliance and sleep deprivation(14).

According to this study there was no association of breakthrough seizure observed with alcohol consumption, level of education and smoking(14).

In Nigeria prospective interventional study was conducted among 234 naive epileptic patients from October 2008 to May 2011 to assess epileptic seizure outcome after 2 subsequent years of follow up on AED with monotherapy(10). Finally after 2 years of follow up on AED, 147 (63%) of patients were completely seizure free and factors that had significant prognostic effect were female sex, older age greater than 20 years, secondary and tertiary educational backgrounds, employment, family support, regular follow up and drug adherence(10).

Thus, in regard to this study older age epileptic patients, those who were employed, highly educated, well supported by their family to purchase drugs and who had regular follow up were more likely to be free of any seizure episodes(10).

A study was done at Gondar University Referral Hospital to assess the frequency of seizure attack and associated factors among patients with epilepsy from March to May in 2017. In this institution based cross-sectional study 408 patients participated found out that the number of seizure attack in the 2 months was reported by 166(40.7%) of the participants with seizure attacks ranging from 1-17 attacks(8).

According to the study, factors that were found to increase the incidence of seizure attacks were exposure to noise and flickering light, having history of head injury and lack of sleep. On other hand drug compliance and better wealth index (middle and rich) minimize the frequency of seizure attacks(8).

Another hospital-based cross-sectional study which was conducted by patient interview and chart review from March 10 to April 10, 2018 at a Mizan-Tepi University Teaching Hospital, to assess epilepsy treatment outcome and its predictors among outpatients with epilepsy. From a total of 143 studied patients with epilepsy participated found out that 60.8% had uncontrolled seizures(15). After two years of follow up it is found that around 39% of patients with epilepsy were seizure-free (15).

The finding of this study showed that drug adherence, history of head injury before seizure occurrence and number of seizure episodes before AEDs initiation were found to influence epilepsy treatment outcome. On other hand less drug compliance was an independent predictor of uncontrolled seizures(15).

Based on this study, more than half of patients with epilepsy had poorly controlled seizures. Lack of adherence to AEDs, number of seizure attacks before AEDs initiation, and head injury before seizure occurrence were predictors of uncontrolled seizure. AEDs adherence should be increased by an access to antiepileptic drugs without charge and attention should be given to patients with history of head injury and high number of seizure attacks before AEDs initiation(15).

There was another hospital based cross-sectional study conducted from March 2017 to May 2017 at the neurologic clinic of Ayder comprehensive specialized hospital (ACSH) to assess treatment

outcome and associated factors among epileptic patients on follow up at ACSH. Data were collected through patients interview and review of medical records from 270 study participants(3). Out of the total, 46.6% participants had controlled seizure. The remaining had seizure attack ranging from one to ten and only 5.9% had experienced seizure attack greater than ten times(3).

This study revealed that alcohol consumption was a risk factor for developing seizure and it increased the risk of seizure in epileptic patients. The finding reported that low medication adherence was significantly associated with uncontrolled seizure and patients with bad medication belief were less likely to have seizure free period compared to those with good medication belief. Epileptic patients with comorbidity tends to have more seizure incidences as compared to those without comorbidities(3).

According to this study more than half of the epileptic patients had uncontrolled seizure. Attention should be given to potentially modifiable risk factors. Educational programs about the importance of their medication, adherence, and precipitating factors such as alcohol should be given(3).

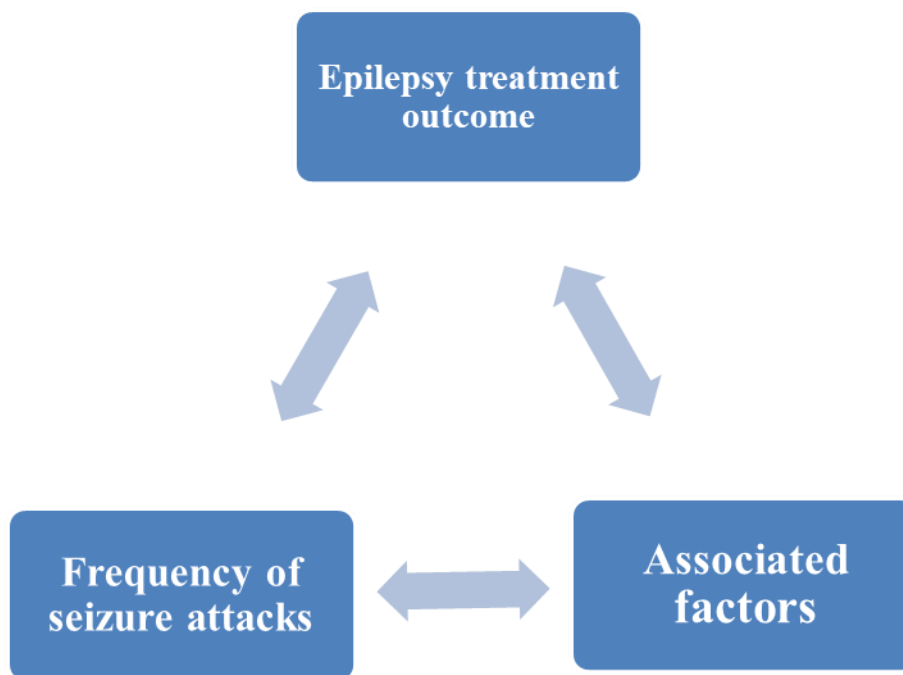
Hospital based cross-sectional study was conducted on 265 patients using patients self-report and pharmacy refill record in jimma university hospital from January 31st to march 14,2013 found out 58.5% fully adherent to medications. Among those who had missed their medication, their most common reasons for missing were forgetfulness 31.8% followed by being busy 20.9%(16).\\

2.2 Significance of Study

Epilepsy is a problem of the developing world accounting for nearly 80% of world cases. Ethiopia has a prevalence of 5.2/1000 with almost more than 50% poor adherence and seizure episode.

This results in a large economic fallout and enormous social problem, but little is known about the frequency of this seizure attack. The aim of this study is to determine the frequency of seizure as well as identifying important seizure provoking factors.

This research is essential in understanding the cause of recurrent seizure episodes and in developing evidence-based interventions that will make a difference in mitigating seizure attacks in epileptic patients on AEDs and hence improve their quality of life and subsequent follow-up. Results of this study may help us understand the magnitude of the frequency of seizure episodes and associated factors.



Conceptual framework for frequency of seizure episodes and associated factors

CHAPTER THREE

3.1 Objective

3.1.1 General objective

- To assess the magnitude of seizure attack and associated factors among patients with epilepsy on follow up at JUMC neurologic OPD

3.1.2 Specific objectives

- To assess magnitude of seizure attack among epileptic patients
- To assess the factors associated with recurrent seizure attacks

CHAPTER FOUR

4.1 Method and Materials

4.1.1 Study area and study period

The study was conducted in the neurologic clinic of JUMC which is located in Jimma zone. Jimma zone comprises Jimma town and its nearby woredas. It is located in Oromia regional state, South West of Ethiopia with an estimated population of 2, 486, 1 55. The town is located 346 KM from the capital, Addis Ababa.

Jimma medical center is the only teaching and referral hospital for the southwest population in the country. The hospital gives health services at the inpatient and outpatient levels as a referral hospital for 15 million populations in the South West of the country.

Under the Department of Internal medicine, it has general medical wards, sub-specialty units with a total of 120 beds and chronic follow-up clinics. The neurology clinics provide services for 1500 epileptic patients and in average around 200 patients are seen every month both from Jimma town and surroundings. Patients are being followed by internists and internal medicine residents. The study was conducted from October 1, 2021 to December 30, 2021.

4.2 Study design

Three months prospective cross-sectional study was used to evaluate seizure attack among epileptic patients on follow up at neurology clinic of Jimma University Medical Center from October 1, 2021 to December 30, 2021.

4.3 Population

4.3.1 Source population

All epileptic patients on follow up at neurology clinic of JUMC OPD.

4.3.2 Study population

All epileptic patients on follow up at neurology clinic of JUMC from October 1, 2021 to December 30, 2021 until required sample size was achieved.

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

All epileptic patients on follow up at neurology clinic of JUMC during October 1, 2021 to December 30, 2021.

4.4.2 Exclusion criteria

All patients who deny verbal consent to the interview were excluded. Epileptic patients who were less than 15 years of age are excluded. Epileptic patients who were newly diagnosed (months) were excluded.

4.5 Sample size determination and sampling technique

4.5.1 Sample size determination

The sample size was calculated based on information about the proportion on seizure episode not exist, we assume $p=0.5$, absolute precision of 5% and at 95% level of confidence were entered in to a single proportion formula with a non-response rate of 5 %, 403 subjects were estimated as shown below.

$$n = \frac{Z_{\alpha}^2 (1-p)p}{d^2}$$

Where $N = \text{sample}$ $z_{\alpha} = 1.96$

$p = \text{prevalence of epilepsy (50\%)}$

$d = \text{marginalized error which is 0.05 (5\%)}$

Confidence interval= 95%

$$n=384+5\%NR= 403$$

4.5.2 Sampling technique

Systematic random sampling technique was used to select the study participants. The sampling frame was obtained from Jimma specialized hospital's chronic follow up registration book, every second clients was selected till the sample size was reached

4.6 Measurements and study variables

4.6.1 Instruments

Questionnaire were used for data collection with the following contents: age, sex, chart number, marital status, level of education, monthly income, area of residence, duration of epilepsy, history of seizure attack and administered AED medications.

4.6 Study variables

4.6.1 Dependent variables

Seizure attack among epileptic patients on AEDs.

4.6.2 Independent variables

Age

Sex

Duration of epilepsy

Monthly income

Sleep duration

Place of residence

level of education and occupation

history of episode of seizure

marital status

Co-administered medications

History of trauma

4.8. Data collection procedure

Data was collected manually using a questionnaire. The data was collected by trained nurses. The patients were interviewed to get the data not found in the charts. Additionally, the charts of the study population were reviewed after cross-checking chart number on the chart with that on the registration book. Then the data was filled by the data collectors in to the questionnaire. Standard and infection based infection prevention protocols was applied in order to prevent Covid- 1 9 transmission.

4.9 Data quality management

All data were collected using a uniform data collection format. All data collectors were trained on the standardized study protocol and data collection format before initiation of the study. To ensure data quality, a pre-test was conducted on 5% of the sample. Training was given to data collectors

and supervisors on the data collection process. The collected data were checked for completeness and consistency on each day of collection. The principal investigator led the overall activities during the data collection period. Questionnaires were prepared in English and back-translated into Afaan Oromo/Amharic and translated back into English to check its consistency. The Afaan Oromo /Amharic versions was used for data collection after pretesting on 5% of the actual sample size before the data collection.

4.10 Data processing and analysis

Data were entered, coded, and cleaned in EpiData version 3.1 software applications. Then it was exported to Statistical Package for Social Sciences (SPSS) software (version 25, USA) for analysis.

Summary findings presented by tables. The potential predictor variables tested in bivariate analyses (Chi-square or the Fisher exact test, as appropriate) separately for the associated factor.

The variables which were significant in the bivariate analysis at a cut point of P-value of < 0.25 were a candidate for multiple logistic regression analysis. Finally, a p-value < 0.05 was used as a cut-off point for the presence of statistical significance.

4.11 Dissemination of result

The findings of the study will disseminated to all relevant stakeholders like Jimma University, Clinicians, researchers, and others through presentation Seminars and publications. Copies of the research will be given to Jimma University, Faculty of public health postgraduate program and the Department of Internal Medicine. Publications in peer-reviewed, national or international journals will also be considered.

4.12 Ethical issues

Ethical clearance was obtained from the Ethical Review Committee of Jimma University. Permission was obtained from the hospital. Patient confidentiality was ensured during the study period. There were no risky procedures that were applied to patients.

5. Results

5.1. Response Rate and Sample size

The data were collected from 401 respondents through face-to-face interviews making the response rate of 99%.

5.2. Socio-demographic characteristics of respondents

According to this study, the majority of the respondents 208(51.9%) were between 15 and 30 years of age and the mean age is 27 years. About 215(53.6%) of the respondents were male and 228 (56.9%) of them were from rural residence. Regarding marital status of the respondents about 202 (50.4%) of them were single. Only 24(6%) of respondents have higher education of college and university. About 186 (46.4%) of study participants attended primary education. With regard to occupation 119(29.7%) of the respondents were unemployed. About 244 (60.8%) of study participants had an average family monthly income below 2000 Ethiopian birr.

Table1. Socio-demographic factors of study participants of seizure episode among patient with epilepsy in Jimma.

Variables with category		Frequency	Percent
Age	15-30	208	51.9
	30-45	146	36.4
	45-60	37	9.2
	>60	10	2.5
Sex	Male	215	53.6
	Female	186	46.4
Residence	Rural	228	56.9
	urban	173	43.1
Marital status	married	176	43.9
	single	202	50.4
	divorced	18	4.5
	widowed	5	1.2
Educational status	no formal school	127	31.7
	primary school	186	46.4
	high school	64	16
	higher education	24	6
Occupation	Government employee	26	6.5
	student	90	22.4
	farmer	88	21.9
	merchant	17	4.2
	daily laborer	40	10
	housewife	21	5.2
	unemployed	119	29.7
Monthly income	<1500	244	60.8
	1500-3000	110	27.4
	3000-5000	38	9.5
	>5000	9	2.2

5.3. Treatment and disease related characteristics of study participants of seizure episode

Treatment characteristics of study participants is shown in Table 2, concerning the duration of treatment of epilepsy, majority of respondents 220(54.9%) have taken AED for more than 10 years. Three fourth (73.1%) of the respondents reported that they had history of GTCS.

Regarding the drugs the common anti-epileptic drug used to treat epilepsy is Phenobarbital reported by 153 respondents which accounts for 38.2% of current treatment and mono treatment modality reported by 235 of respondents that for accounts around 58.6% and both phenytoin and phenobarbitone were 117(29.2%). Four (1 %) respondents had history of head injury. Related to drug around 107 (26.7%) of the respondents have missed to take their drug. About 21(5.2%) of the respondents had experienced lack of sleep whereas 55 (13.7%) of study participants reported that they experienced emotional stress previously.

Table 2. Treatment related characteristics of study participants of seizure episode and associated factors among patient with epilepsy in Jimma.

Variables with category		Frequency	Percent
duration of epilepsy treatment	<1 year	11	2.7
	1-5 years	91	22.7
	5-10years	79	19.7
	>10 years	220	54.9
type of seizure	GTCS	293	73.1
	FOCAL SEIZURE	105	26.2
	Unclassified	3	.7
no of drug used	One	235	58.6
	Two	117	36.7
	Three	19	4.7
Type of drug	Phenytoin	79	19.7
	Phenobarbitone	153	38.2
	Carbamazepine	3	.7
	Valproate	1	.2
	phenytoin and phenobarbitone	117	29.2
	phenytoin and Carbamazepine	21	5.2
	phenytoin and valproate	8	2
	phenytoin , phenobarb and carba	16	4
	phenytoin , phenobarb &valproate	3	.7
head injury	No	397	99
	Yes	4	1
missed doses	No	294	73.3
	Yes	107	26.7
lack of sleep	No	380	94.8
	Yes	21	5.2
emotional stress	No	346	86.3
	Yes	55	13.7

Overall about 42.6% (n=171) of respondents had experienced seizure attacks in the last 3 months.

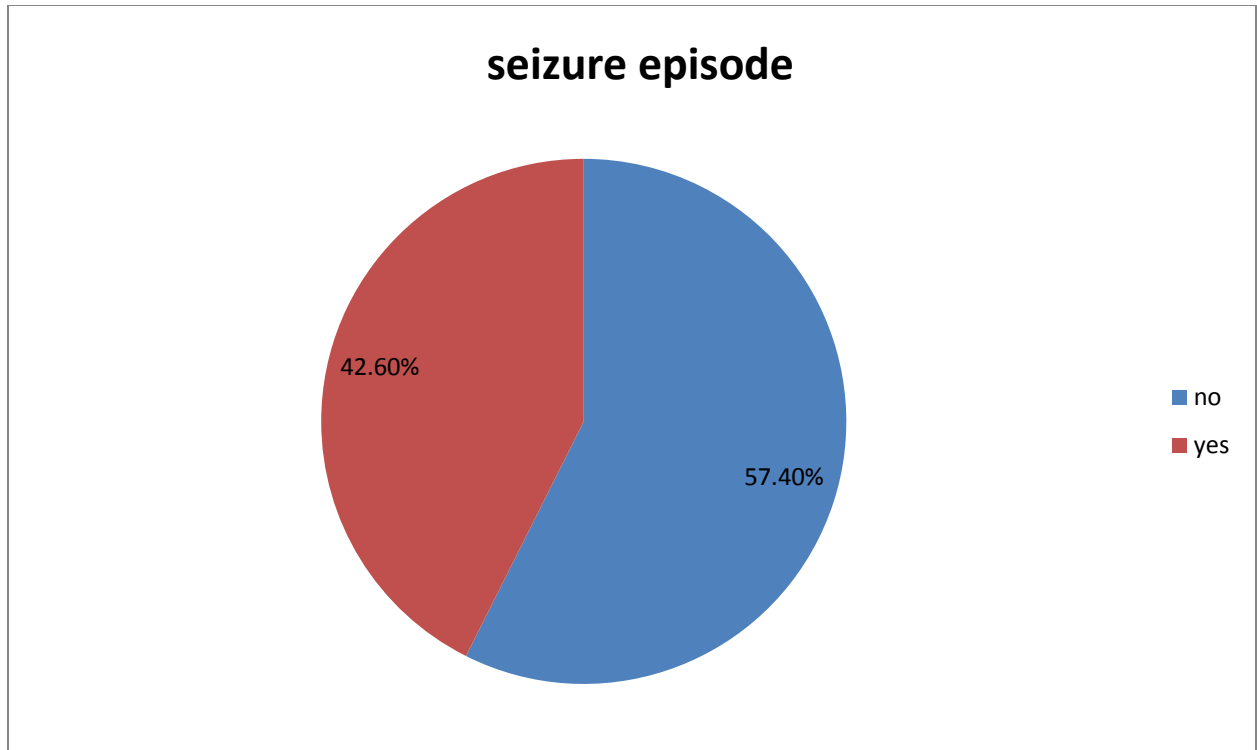


Figure 1:- seizure episode among patient with epilepsy in Jimma.

As indicated in figure 2, the smallest and highest numbers of seizure attacks in the last 3 months were 1 and greater than 10 respectively. 229 (57.1%) of the respondents had not experienced seizure attack and 13 respondents reported greater than 10 seizure attacks. About 1-2 seizure episode 26.9 % (n=108) were the most frequently seizure attack experienced by study participants , 3-5 were the second seizure attack experienced by study participants which were 10.2% (n=41).

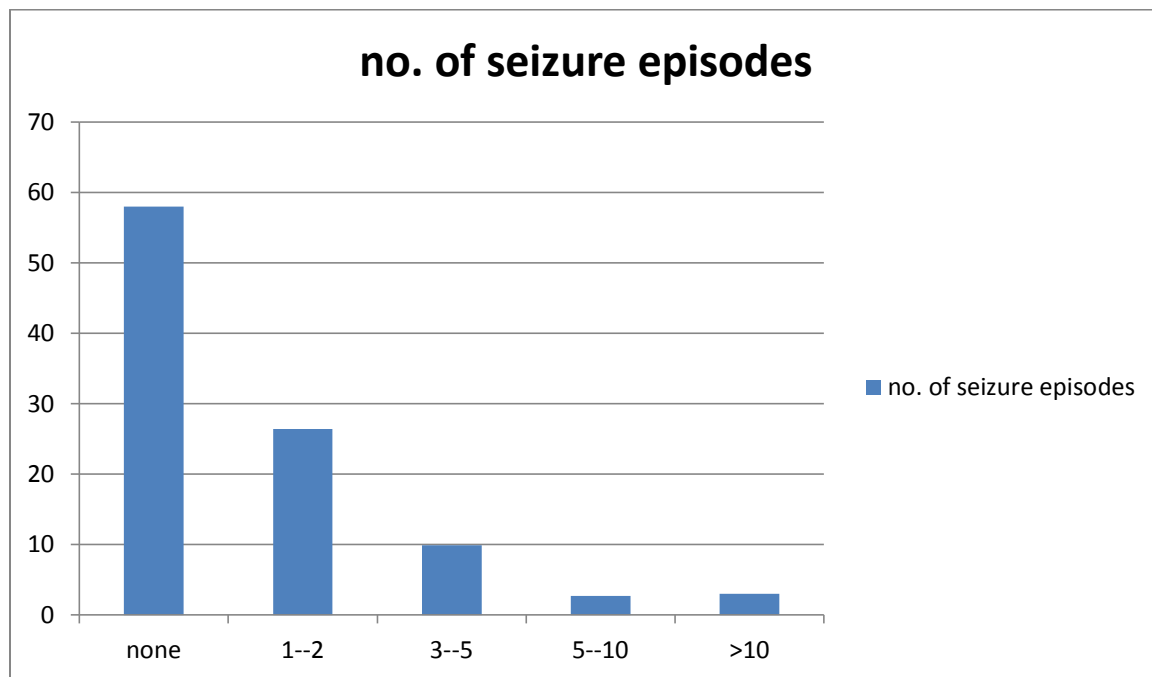


Figure 2:-The number of seizure episode among patient with epilepsy in Jimma

5.4. Factors Associated with seizure episode

In order to identify factors associated with seizure episode logistic regression with backward method was used. The predictor variables which have been wanted to consider were age, duration of epilepsy treatment. Number of drug used, head injury, lack of sleep. The final model indicates that there is a significant predictive power for the variables duration of treatment for epilepsy and number of drug used. It has been seen that the Hosmer Lemeshow chi-square test for the final seizure episode model yields a p-value of 0.986, thus suggesting a model that fits the data.

As shown in table 3, In multiple logistic regression, Patients with longer duration of epilepsy were less likely to have seizure episode compared to those patients with shorter duration of epilepsy (more than 10 years vs less than one year) [AOR=0.21, 95%CI: 0.049-0.770, p=0.032] .

The odds of seizure episode was 3.5 times higher among patients with multiple therapy as compared to patients with monotherapy modality [AOR=3.5, 95%CI: 1.31-9.40, p=0.012]

Table3. Factors associated with seizure episode among patient with epilepsy in Jimma.

Characteristics	Category	Seizure. E		COR	AOR	PV
		Yes	No			
Duration of epilepsy treatment	<1 year	8	3	1	1	
	1-5 years	36	55	0.25(0.06-0.99)	0.19(0.047-0.769)	.020
	5-10years	25	54	0.17(0.04-0.71)	0.11(0.27-0.471)	.003
	>10 years	102	118	0.32(0.08-1.25)	0.21(0.049-.770)	.032
Age	15-30	95	113	1	1	
	30-45	59	87	7.57(0.94-60.80)	0.81(0.52-1.27)	.351
	45-60	16	21	6.10(0.75-49.46)	0.84(0.41-1.76)	.650
	>60	1	9	6.86(0.79-59.81)	0.15(0.02-1.23)	.078
no of drug used	One	79	156	1	1	
	Two	80	67	2.36(1.54-3.60)	2.6(1.66-4.01)	.001
	Three	12	7	3.39(1.28-8.94)	3.5(1.31-9.40)	.012

6. Discussion

This study aimed to assess seizure attack and associated factors among epileptic patients on follow up at Jimma University medical center outpatient. According to this study 42.6% patients had history of seizure attack with the minimum and maximum numbers of seizure attacks in the last 3 months were 1 and greater than 10 respectively.

The finding of this study is comparable to study conducted in Gonder University hospital and Jimma university((8,16), but lower to this study done in Ayder specialized hospital(3,15).

The study revealed that the most common type of seizure was GTCS (73.1%).

The majority of the patients were on monotherapy and the most commonly used AEDs is phenobarbitone(38.2%) followed by phenytoin (19.7%) and commonly used polytherapy were the combination of phenobarbitone with phenytoin(29.2%)followed by the combination of the phenobarbitone and carbamazepine (5.2%). This is similar to studies done in Mizan Tepi University hospital and black lion specialized hospital that either phenobarbitone or phenytoin or was the most prescribed AED as monotherapy(7,15).

Although optimum AED therapy eliminates seizure by 70%, approximately one-third of patients continue to experience seizures despite appropriate treatment(7-9). But, our finding was contrary to these reports, only 58.1% of patients with epilepsy were seizure-free during the last three months. This figure is higher as compared with the study done in different parts of the country(3,8). The reason could be the difference in the duration of the outcome measurement report, which was short in the previous study.

Our findings indicated that history of a head injury before seizure occurrence were not found to be associated factors for seizure attack which is in contrary to couples of study that showed head injury is determinant factors(8,15). This could be because of few patients (1%) reported history of head injury.

Those patients with duration of treatment for epilepsy more than 10 years have less incidence of seizure episode compared to those patient having duration of treatment less than one year [AOR=0.21, 95%CI: 0.049-0.770, p=0.032].

The odds of seizure episode was 3.5 times higher among clients who had three drugs as compared to clients with mono treatment modality [AOR=3.5, 95%CI: 1.31-9.40, p=0.012]

7. Conclusion and recommendation

More than one-third of respondents were experienced seizure attacks while in the course of AED treatment and follow up. Duration of treatment and the number of drug used were factors independently associated with seizure attacks. Strengthen treatment modality is crucial. Further, longitudinal prospective studies are also needed to fully understand the nature of these factors in seizure attacks.

8. Limitation of the study

This is hospital based cross-sectional nature of the study and difficult to generalize the findings of this study to patients with epilepsy outside the study area are the limitations of this study. This problem can be addressed by further multi- centered prospective study.

Abbreviation

AOR: Adjusted odds ratio

AEDs: Antiepileptic drugs

GTCS: Generalized tonic-clonic seizure

SPSS: Statistical Package for Social Science

Consent

Written informed consent for participation in the study was obtained from the patients or attendants. The confidentiality of all the patients was maintained.

Acknowledgments

The authors would like to thank advisors, the data collectors and study participants.

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Questionnaires

Questionnaires on assessment of frequency of seizure attack and associated factors among epileptic patient on follow up at Jimma University medical center OPD.

Medical registration number:-

I) Socio-demographic characteristics

- 01) Age: - a) 15-30 b) 30-45 c) 45-60 d) >60
- 02) Sex: - a) male b) female
- 03) Area of residence a) Urban b) Rural
- 04) Marital status a) married b) single c) divorced d) widow
- 05) Level of education: - a) no formal school b) Primary school c) High school d) higher
- 06) What is your occupation? a) Government employee b) student
c) Farmer d) merchant
e) Daily laborer g) other specify

II) Questionnaires on epilepsy and its treatment

07) Duration of epilepsy treatment? a) <1year b) 1-5 years c) 5-10years d) > 10years

08) What is type of seizure? A) GTCS b) Focal seizure c) Unclassified seizure

09) Numbers of drugs are you taking? a) One b) two c) three

10) Mention type drug you are currently taking? a) Phenytoin b) phenobarbital c) carbamazepine d) valproate e) combination

11.1) did you have seizure episode? a) Yes b) no

11.2) If yes how often do you have seizure episode in a month?

a) None b) 1-2 c) 3-5 d) > 5

12) If your answer to above question is b, c and d what are provoking factors?

a) Sustained head injury b) missed doses c) Lack of sleep d) emotional stress d) menses e) other specify.....

13) If you have missed doses of AED, how many doses? a) 1-3 b) 3-5 d)>5

14) How long have you been seizure free?

a) one year b) two years c) >2years d) <1year

III) Questionnaires on screening risk factors

15) What is your monthly income? a) <1500 birr b) 1500-3000 birr c) 3000-5000 d) >5000 birr

16) Are you currently smoking? a) Yes b) no

17) Are you currently drinking? a) Yes b) no

18) Do you chew chat? A) Yes b) no

16) Do have any comorbidity? a) DM b) HTN c) Cardiac d) Other specify

20) Did you ever have EEG during your follow up? A) Yes b) no

21) Did you have any of the following side effects?

a) headache b) depressed mood c) epigastria pain d) Gingival hyperplasia e) Hypersomnia f) Forgetfulness g) Weight gain i) Skin rash j) other specify