

Original Article



Barriers of Drug Adherence among Patients with Epilepsy: in Tertiary Care Hospital, South India

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ABSTRACT

Introduction: Epilepsy is a treatable and curable brain disorder. However major proportion of individuals with this disease in developing countries receives no treatment because of misunderstandings of the public. Other than that, poor adherence to ordered medication is considered the primary cause of drug therapy failure in epilepsy. This study conducted to assess the adherence pattern to antiepileptic regimen, among patients with epilepsy and to identify the clinical and patient-related factors contributing as barriers.

Methods: A cross sectional survey design was used in 100 epilepsy patients in an Outpatient unit of tertiary care center. A Convenient sampling technique was used to enroll the patients who met inclusion criteria. Structured interview with pre-tested questionnaire and eight item Morisky Medication Adherence Scale was used to collect the data. Descriptive and inferential statistics were used for analysis of data. Descriptive statistics (mean, standard deviation, frequency and percentages) were used to describe the clinical and demographic variables of study participants. The determinants of medication adherence were analyzed using Chi-Square test and independent student t- test. The analysis was done with SPSS 20th version.

Results: Majority (71%) of patients were not adherent to antiepileptic treatment. Severity of seizure (indicated by the presence of seizure last year), medication frequency and complexity of treatment were found to have significant association with the Anti-Epileptic Drugs (AED) adherence status. Status of adherence is significantly associated with frequency of seizure/year and positive life style.

Conclusion: As Medication adherence was observed to be low, services for adherence counseling and health educational interventions in the epilepsy clinics is recommended.

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Introduction

Epilepsy is one of the common neurological disorders which is featured by abnormal movement; may occur with or without loss of consciousness. Globally, nearly 70 million people have epilepsy. However, epilepsy is a hidden disorder like an iceberg, and many cases go un conveyed.¹ There may be more than 40 billion epileptics. In India, the prevalence rate of epilepsy is 5-10 per 1000 population. It's with two major types; generalized or partial.² All over the world, misconceptions, fright and negative public attitudes toward this most prevalent neurological disorder results in discrimination, isolation and widespread social rejection of epileptic patients.³ This common disease can be prevented and treated at a bearable cost effectively. Adherence to medication is a central pillar to effectiveness of antiepileptic therapy. Poor adherence to ordered medication is considered the primary cause of drug therapy failure in epilepsy. There is a rise in the number as well as the severity of seizures among non-adherent patients and this result in an increased number of hospitalizations. Non-adherence, therefore,

results directly in a rise in health care costs, and compromised quality of life.⁴ Adherence can be described as the extent to which a person's character and daily activities correspond with physician's advice.

Antiepileptic therapy is an essential intervention aimed at improving the quality of life of patients who suffer from a disease which is known for its stigmatization with many cultural misconceptions.⁴ Poor adherence to long-term therapies like epilepsy deeply alter the efficiency of treatment making this a crucial issue in public health from all the perspectives of life.^{5,6}

Materials and methods

Cross sectional survey design was adopted to assess the adherence pattern to antiepileptic regimen, among patients with epilepsy. This study was conducted among 100 epilepsy patients with age ranges from 18 years to 65 years, in epilepsy clinic of a tertiary care hospital, South India during August 2014 to February 2015. Sample size was estimated with an expected percentage of patients with adherence as 50% (which

gives the maximum sample size) at 5% level of significance and 20% relative precision which was calculated in open Epi website. An inclusion criterion was, the patients diagnosed with epilepsy, willing to participate and taking antiepileptic medications for at least one year. The patients who are below 18 years of age, patients who have mental retardation and severe physical impairments, and who were less than one year of anti-epileptic treatment were excluded from the study.

A consecutive sampling technique was used. 12-15 subjects per day were recruited for the study and the recruitment was done according to the inclusion criteria. Structured interview from a pre-tested questionnaire and medical records review was done to collect the data.

Eight Item Morisky Medication Adherence Scale (MMAS) was used to assess the adherence pattern to antiepileptic regimen. The MMAS is a standardized 8-item questionnaire with seven Yes/No questions and all yes response scored as 1; No response as Zero and one question answered on a 5-point Likert scale (A: Never/Rarely, B: Once in a while, C: Sometimes, D: Usually, E: All the time) and all B-E response were scored as 1(one), A (Never/Rarely) response scored as zero as per tool. According to the scoring system for the MMAS, 0 = high adherence, 1 to 2 = medium adherence, and more than 2 = low adherence. In many studies, Patients who had a score of 0 to 2 were considered adherent and more than 2, as nonadherent in many studies.⁷ Present study adopted the same scoring system. Assessment of the Patient related factors such as lifestyle, social support and patient-prescriber relationship was done with the help of Rating Scale. Assessment of the Behavioural factors such as knowledge, belief and attitude was assessed by using self-prepared questionnaire consisting of 30 questions.

Morisky et al.⁷ reported Cronbach's α of 0.83 in the MMAS-8. For test-retest reliability, the MMAS-8 showed an excellent ICC (Intra-class Correlation Coefficient) of 0.79. The study was approved by Institute Scientific Advisory Committee (PGMRC/MSN/2014) and Ethics Committee (No. Jip/IEC/SC/2014/4/567). Informed written consent was obtained from all subjects under study. Confidentiality of the data, right to withdraw from the study at any period of time and anonymity of the subjects were explained prior. The subject data sheet having structured components including socio demographic and clinical factors, Knowledge, attitude and belief assessment questionnaire and Rating scale used to assess the relationship between lifestyle, social support and patient prescriber relationship were content validated with subject experts, reliability established by test-retest method ($r=0.8$) and pre tested before data collection with 10% of sample size.

Both descriptive and inferential statistics were used for analysis of data. Descriptive statistics (mean, standard deviation, frequency and percentages) were used to describe the clinical and demographic variables

of study participants. The determinants of medication adherence were analyzed using Chi-Square test and Independent Student t-test. Data analysis was done with IBM SPSS 20th version.

Results

About 52% of the patients were females and 69% were below the poverty line. Regarding the education status, majority 65% of the subjects had no formal education, 31% of them had education up to primary or secondary. Pertaining to occupation, 63% of the patients were employed. Majority (68%) of the patients was married and 90% were from the rural area. (Table1)

Table 1. Demographic Characteristics N=100

Variable	N (%)
Age (years)	
<35	47 (47)
35-50	46(46)
>50	7(7)
Age* (years)	35.17 (9.72)
Sex	
Male	48(48)
Female	52(52)
Education	
No formal education	65(65)
Primary and Secondary	31(31)
Diploma, Graduate, PG	4(4)
Occupation	
Employed	63(63)
Unemployed	37(37)
Marital Status	
Single	30(30)
Married	68(68)
Widow/Widower	2(2)
Divorced	0(0)
Income	
≤2500 (BPL)	69(69)
>2500 (APL)	31(31)
Religion	
Hindu	95(95)
Muslim	4(4)
Christian	1(1)
Domicile	
Rural	90(90)
Urban	10(10)
Type of family	
Nuclear	84(84)
Joint	16(16)
Source of information regarding epilepsy	
TV/Radio	22(22)
Newspaper/Magazine	11(11)
Family and friends	38(38)
Health professional	29(29)

*Mean (SD)

The mean duration of epilepsy was 6.16 years, the mean age of onset was 17.13 years and 52% of patients had partial type of epilepsy. Majority (94%) had at least one seizure episode last year and the mean frequency of seizure per year was 7.25. Majority (91%) had no comorbidities like hypertension or diabetes mellitus. Regarding the complexity of treatment, 51% were on polytherapy and the remaining on monotherapy. Majority (67%) were taking medications three times a

day. Side effects were reported by 41% of the study participants. Among the 100 patients, 26 had the family history of epilepsy. (Table 2)

Table 2. Distribution of epilepsy patients in relation to different clinical factors (N=100)

Variable	N (%)
Type of epilepsy	
Partial	52 (52)
Generalized	48(48)
Duration of epilepsy	
>5 years	58(58)
5-10 years	26(26)
11-20 years	12(12)
20 years	4(4)
Mean age of onset*(years)	17.13 (3)
Mean duration of epilepsy* (years)	6.16(1)
Presence of at least one seizure episodes last year	
Yes	94(94)
Frequency of seizure/year	
No seizure	6(6)
<12	83(83)
>12	11(11)
Mean frequency of seizures*/year	7.25(2)
Co-morbidity	
Yes	9(9)
Complexity of treatment	
Monotherapy	49(49)
Polytherapy	51(51)
Medication frequency	
Twice daily	27(27)
Thrice daily	67(67)
At bed time	6(6)
Side effects	
Yes	41(41)
Family history	
Yes	26(26)

*Mean (SD)

Majority (71%) of patients were not adherent to antiepileptic treatment (Morisky value higher than 2). (Figure 1) the status of adherence to antiepileptic regimen

Among the clinical factors, severity of seizure (indicated by the presence of seizure last year; p=0.007), medication frequency (P=0.001) and complexity of treatment (P=0.003) were found to have significant association with the AED adherence status. The non-adherent group had more number of seizures last year comparing to the adherent group mean as mean frequency (SD) in adherent and non-adherent group was 8.79 (5.17) Vs 3.48 (3.53).

Those who were on monotherapy were more adherent than those who were on polytherapy which shows that as the number of drugs increases, adherence decreases. Majority of the non-adherent group were taking medications thrice a day comparing to the adherent group, most of whom were taking drugs twice a day.

Other factors like type of epilepsy, duration of epilepsy, side effects, family history and co-morbidity were not associated with the status of adherence in the study. (Table 3) Status of adherence is significantly associated with frequency of seizure/year (P=0.0001). Those who

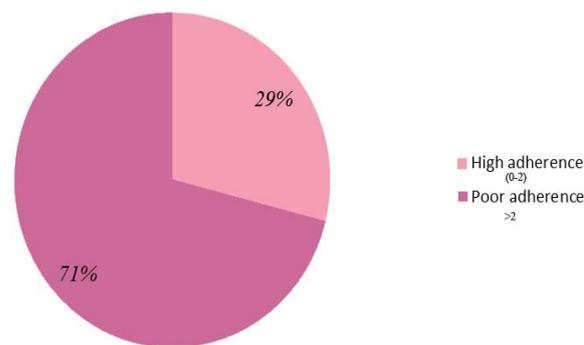


Figure 1. Distribution of epilepsy patients in relation to adherence

Table 3. Association of status of adherence with clinical variables N=100

Variable	Status of adherence		P [§]
	High drug adherence (n=29) N (%)	Poor drug adherence (n=71) N (%)	
Type of epilepsy			
Partial	15(51.7)	37(52.1)	0.57
Generalized	14(48.3)	34(47.9)	
Presence of seizure last year			
Yes	24(82.8)	70(98.6)	0.007*
No	5(17.2)	1(1.4)	
Co-morbidity			
Yes	2(6.9)	7(9.9)	0.28
No	27(93.1%)	64(90.1)	
Complexity of treatment			
Monotherapy	21(72.4)	28(39.4)	0.003*
Polytherapy	8(27.6)	43(60.6)	
Medication frequency			
Twice daily	18(62.1)	9(12.7)	0.001*
Thrice daily	7(24.1)	60(84.5)	
At bed time	4(13.8)	2(2.8)	
Side effects			
Yes	9(31.0)	32(45.1)	0.07
No	20(69.0)	39(54.9)	
Family history			
Yes	9(31.0)	17(23.9)	0.15
No	20(69)	54(76.1)	

§Chi-square,*significance at p<0.05

were poorly adherent had more number of seizure episodes per year and with Lifestyle (P=0.0001). Those who had positive lifestyle were highly adherent to antiepileptic regimen. Social support and patient prescriber relationship were not associated with adherence status; however social support and patient-prescriber relationship was reported to be good irrespective of the patients' adherence level to antiepileptic regime. (Table 4) Further, Participants with increased knowledge about the disease and its management had better adherence to treatment regime which was significant at P< 0.0001. (Table 5)

Discussion

This cross-sectional study included 100 adult epilepsy patients with a mean age of 35.17 years (SD 9.72). The

Table 4 Comparison of status of adherence in relation to the behavioral factors N=10

Variable	Status of adherence		Statistical indicators [§]
	High drug adherence (n=29)	Poor drug adherence (n=71)	
	Mean (SD)	Mean (SD)	
Lifestyle	30.03 (3.94)	25.85 (3.92)	0.0001*
Social support	8.21 (1.37)	8.01 (1.27)	0.5
Patient prescriber relationship	13.28 (1.9)	13.30 (1.39)	0.95

[§]Independent student t- test, *significance at p<0.05

Table 5. Comparison of status of adherence in relation to the patient related factors N=100

Variable	Status of adherence		p [§]
	High drug adherence (n=29)	Poor drug adherence (n=71)	
	Mean (SD)	Mean (SD)	
Knowledge	13.07 (4.32)	8.39 (3.70)	0.0001*
Belief	3.79 (1.82)	3.46 (1.39)	0.33
Attitude	2.76 (1.40)	2.70 (1.16)	0.84

[§]Independent student t test, *significance at p<0.05

gender distribution was almost equal (52% females and 48% males) and the mean duration of epilepsy was 6.16 years (6.03). Only 9% had co-morbidities like diabetes and hypertension and majority (94%) had at least one seizure episode last year. In a similar study conducted in Palestine by Sweileh et al.,⁸ somewhat comparable demographic and clinical variables were observed. Mean age in this sample was 38.6 (12.3) years and among the 75 patients, 60% were male and 40% female. Mean duration of epilepsy was 22.1 (12.1) years. Eighteen patients (13.7%) had other chronic diseases and less than half of the patients (44.7%) had at least one seizure episode during the last three months.

Most of the studies on adherence reveal higher education profile. Approximately 31% in our study had education up to primary or secondary which was similar to an African study done by Ogundele and Dawodu⁹ where 65.8% of the respondents completed at least secondary education.

A similar study done by Hovinga et al.,¹⁰ observed very high level of education that most of the respondents (88%) completed at least primary or secondary education. In the present study, majority (68%) of the patients were married, the mean age of onset was found to be 17.13 years and 48% were having generalized type of epilepsy.

In a similar study by Hovinga et al.,¹⁰ among 408 patients, more than half (52%) were married, the mean age of onset was 20 years and about 57% were reported with generalized epilepsy. There was huge discordance in the presence of side-effects reported in both studies. Present study reported that 59% were having side-effects while this American study reported side-effects of about 9%. Poly therapy and type of drugs prescribed may be the reason for increasing side effect in our study. Approximately half of patients (51%) in this study were on polytherapy. Similar proportions were found in other studies also.¹¹⁻¹⁴

In this study patients were evaluated for their adherence status to the antiepileptic medications and they were classified into two groups: high adherence and poor adherence. Patients who had a score of 0 to 2 were considered adherent and >2, non-adherent in many studies. In the present study, among the 100 patients, majority (71%) of patients were not adherent to their anti-epileptic drugs. studies adopted the MMAS to assess adherence in epilepsy patients revealed that more than 50% of the people were adherent to treatment regimen¹⁵⁻¹⁸ Similarly, a study carried out in the United States¹⁵ reported that 29% of the patients were nonadherent which is exactly contrary to the present study since it reported only 29% adherence. These results suggest that patients in this study had higher rates of non-adherence compared with patients in other studies carried out using the same methodology for assessment of adherence which could be due to poor educational background, inadequate family support and incomplete knowledge on the disease management.

In another study conducted by Ogundele et al.,⁹ good adherence was recorded in 70% of participants and the high adherence rate among patients in the study was explained by the fact that 65.8% of the respondents completed at least secondary education, but in the present study shows 71% non-adherence due to poor literacy rate among the participants.

In a similar study conducted by Sweileh et al.,⁹ to assess the medication adherence to epilepsy, out of the 75 participants, majority (64%) were non-adherent based on Morisky Medication Adherence Scale. Increasing age and longer duration of illness were observed as the reason for good adherence in the study. The findings of the present study also revealed a high rate of non-adherence (71%) but age or duration of illness were not found significant as determining factors in contrast to the above study which may be attributed to poor literacy, inadequate family support and need of counseling services in hospitals. Some studies revealed high rate of non-adherence similar to the present study. A study conducted by Nakhutina et al.,¹⁹ reported 63% of non-adherence. Similarly a study conducted by Ahmed et al.,¹³ observed a 79.8% of non-adherence. In this study the complexity of the treatment i.e the patients on multiple drugs and increased drug frequency had low adherence compared to patients on monotherapy. Similar results were noted in other studies also.^{20,21}

Conclusion

As the major proportion of the patient with epilepsy are non-adherent to treatment regime, necessary supportive education to patients with epilepsy regarding the disease condition and importance of being adherent to therapy as well as regular follow-up is important. Systematically and orderly planned health information will be very much beneficial for patients with epilepsy. This will help the patients to follow proper treatment regimen and also help to prevent

recurrence of seizure attacks. This study adopted convenient Sampling, hence the study results may not be generalized in larger extent. Also the results were based on patient's recall of facts which sometime biased.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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