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Original Research Article

Adherence to the anti-epileptic drugs among children with epilepsy- a cross sectional study in a tertiary care hospital

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ABSTRACT

Background: Epilepsy is the commonest chronic and highly stigmatized neurological problem that affects many children. It is defined by two or more unprovoked seizures. The main stay of the epilepsy management is the anti-epileptic drugs and strict adherence to anti-epileptic drugs is the key to successful treatment. The 70% of children will become seizure free with appropriate anti-epileptic drug (AED) treatment. The goal of treatment of epilepsy includes minimizing the risk of recurrent seizures and side effects, and maintaining normal psychosocial and educational/vocational adjustment. Our study will assess the level of adherence to AEDs in children and factor associated with non-adherence.
Methods: A cross-sectional prospective descriptive design study, conducted in Government medical college and Rajindra hospital, Patiala, Punjab from December 2021 to May 2021. 60 patients were included in this study who gave written consent and had been taking at least one AEDs for at least 6 months. Only those patients with normal neurological and cognitive development and no other severe comorbidities were included in this study. Patients and their parents were individually administered a structured questionnaire consisting of personal and demographic Information, self-prepared questionnaire to check compliance and validated questionnaire called Morisky medication adherence scale (MMAS-8). Data was analysed by using statistical package for social science software and $p<0.05$ considered as significant to see the association between factors and non-adherence.
Results: The most common reason for non-compliance was problem in remembering that was seen in 41.8% of the patients. 21.8% of the patients had problems in sticking themselves and 18.6% had problems with buying the drugs. 60% patients are male.
Conclusions: Poor adherence was seen in 50% of our study participants. In our study, patients were not stick to their therapy, buy the drugs or had problem to remember to take their medication.

Keywords: Epilepsy, AEDs, Non-adherence, Children

INTRODUCTION

Epilepsy is the commonest chronic and highly stigmatized neurological problem that affects many children. It is defined by two or more unprovoked seizures.[1] The main stay of the epilepsy management is the AEDs and strict adherence to AEDs is the key to successful treatment. 70% of children will become seizure free with appropriate AED treatment.[2] Epilepsy can restrain activities, decrease quality of life, occupational ability, professional goals and social integration of patients, increases hospital admissions and mortality.[3] The goal of treatment of epilepsy includes minimizing the risk of recurrent seizures and AED side effects, and maintaining normal psychosocial and educational/vocational adjustment.[4]

Adherence to medication is defined as the extent to which a person's behavior in taking medication corresponds

with the agreed recommendation from a health care provider.[5]

The prevalence of non-adherence to AEDs in patients with epilepsy ranges from 20% to 80% depending on the populations studied, definition used for non-adherence, and research methods.[6]

According to the world health organization, non adherence can be grouped into the following five dimensions: socioeconomic-related factors, health care team/health system-related factors, condition-related factors, treatment-related factors, and patient-related factors.[7] Non-adherence to AEDs leads to seizure recurrence, increases morbidity, mortality, decreases quality of life and can predispose injury to oneself or to others.[8,9]

There are direct and indirect methods for measuring the adherence to the drugs. None of these methods are consider as gold standard.[10]. Direct methods include directly observed therapy, measurement of drugs or its metabolites in blood or urine etc. Plasma AED level monitoring does not accurately reflect adherence because of variability in dosage regimens and individual pharmacokinetics.[11]These methods are objective and accurate. Direct approaches are expensive and can be distorted by the patient, burden-some to the health care provider, and susceptible to distortion by the patient. However, for some drugs, measuring these levels. Indirect methods include asking the patient about how they take medicines, assessing clinical response, questioning the patients using questionnaires etc. but questioning the patients can be susceptible to misrepresentation and led to overestimate the patient's adherence. Indirect methods are simple, objective and easy to perform.[10]

Adherence to AEDs is utmost important but due to poor resources in government setup like frequent drug shortages, poor patients not able to afford drugs as prescribed as ours, it is difficult to maintain adherence to AEDs. Our study will assess the level of adherence to AEDs in children and factor associated with non-adherence.

METHODS

A cross-sectional prospective descriptive design study that was conducted in government medical college and Rajindra hospital, Patiala, Punjab, from December 2021 to May 2021. 60 patients were included in this study who gave written consent and had been taking at least one AEDs for at least 6 months. Patients and their parents were individually administered a structured questionnaire consisting of personal and demographic information, self-prepared questionnaire to check compliance and validated questionnaire called Morisky medication adherence scale (MMAS-8) [12] MMAS-8 is composed of 8 items, out of which the items from 1 to 7 are yes/no questions (except item 5) where no answers receive a score of 1.0, and yes answers receive a score of 0. The score is reversed for item 5. Item 8 is measured based on a 1 to 5 Likert scale. The total scores range between 0 and 8, where 8 is considered as high adherence, 6-8 as moderate adherence, and <6 as poor adherences. Data was analysed by using statistical package for social science software and $p<0.05$ considered as significant to see the association between factors and non adherence.

Inclusion criteria

Patients with diagnosed with epilepsy for at least 6 month, administered at least one AEDs, with normal neurological and cognitive development, without other severe co-morbidities and consented to participate in the current study were included in the study.

Exclusion criteria

Patients with age <6 months and > 18 years, taking AEDs for the treatment other then epilepsy excluded from the study.

Ethical approval

Before the initiation of study, ethical approval was taken from ethics committee of government medical college and Rajindra hospital, Patiala.

Statistical analysis

The data was entered into Microsoft excel sheet. Data was analysed by using statistical package for social science software and $p<0.05$ considered as significant to see the association between factors and non-adherence.

RESULTS

The study was conducted in a tertiary care hospital in Punjab, India. 60 pediatric patients were enrolled in this study. The baseline characteristics of the study population and their correlation with adherence were mentioned in Table 1. High as well as poor adherence both were seen in age group of 11to 18 with $p=0.526$. High adherence was found in males (66.7% as compared to female (33.3%); however, the difference was not statistically significant ($p=0.394$). The adherence in urban population was found to be higher as compared to rural population with $p=0.039$. 46.7% of high adherence population belonged to upper lower class as compared to poor adherence population among which 57.8% belonged to lower class ($p=0.157$). Those patients who were on multiple AEDs had poor compliance as compared to those on only one AEDs but not statistically significant ($p=0.393$). The most common reason for non- compliance was problem in remembering that was seen in 41.8% of the patients (Table 2). 21.8% of the patients had problems in sticking themselves and 18.6% had problems with buying the drugs. 60% patients are male. 89.1% of the

study population belong to urban area. 54.5% of the study population belong to lower middle class.

Among poor adherence patients, all (19) had the problem in remembering which was statically significant. 36.8% of poor adherence patient had problem with taking, 68.4% with sticking and 42.1% with buying that was statistically significant with p<0.001. Only 5.3% of poor adherence patients had the reason of drugs side effect which was statistically not significant with p=0.246.

Table 1: Correlation of different variables with adherence levels.

Variables	High adherence, n (%)	Moderate adherence, n (%)	Poor adherence, n (%)	P value
Age (Years)				
1-5	9 (30)	4 (36.4)	4 (21.1)	0.526
6-10	10 (33.3)	4 (36.4)	4 (21.1)	
11-18	11 (36.7)	3 (27.3)	11 (57.8)	
Sex				
Male	20 (66.7)	5 (45.5)	10 (52.6)	0.394
Female	10 (33.3)	6 (54.5)	9 (47.4)	
Region				
Rural	11 (36.7)	5 (45.5)	14 (73.7)	0.039
Urban	19 (63.3)	6 (54.5)	5 (26.3)	
Socioeconomic class				
Lower	6 (20.0)	6 (54.5)	11 (57.8)	0.157
Lower middle	9 (30)	2 (18.2)	4 (21.1)	
Upper lower	14 (46.7)	3 (27.3)	4 (21.1)	
Upper middle	1 (3.3)	0 (0)	0 (0)	
Type of epilepsy				
Focal	10 (33.3)	5 (45.5)	4 (21.1)	0.351
Generalized	20 (66.7)	6 (54.5)	15 (78.9)	
Number of drugs				
1	22 (73.3)	6 (54.5)	11 (57.8)	
> 1	8 (26.7)	5 (45.5)	8 (42.1)	0.393

Table 2: Therapy related factors effect on adherence.

Reasons for non-compliance	High adherence, n (%)	Moderate adherence, n (%)	Poor adherence, n (%)	P value
Problems remembering				
Yes	0 (0.0)	3 (27.3)	19 (100.0)	<0.001
No	30 (100)	8 (72.7)	0 (0.0)	
Problems with taking				
Yes	0 (0.0)	1 (9.1)	7 (36.8)	<0.001
No	30 (100)	10 (90.9)	12 (63.2)	
Problem with sticking yourself				
Yes	0 (0.0)	8 (72.7)	13 (68.4)	<0.001
No	30 (100)	3 (27.3)	6 (31.6)	
Problem with buying the drug				
Yes	0 (0.0)	2 (18.2)	8 (42.1)	<0.001
No	30 (100)	9 (91.8)	11 (57.9)	
Side effects				
Yes	0 (0.0)	1 (9.1)	1 (5.3)	0.246
No	30 (100)	10 (90.9)	18 (94.7)	

DISCUSSION

The 60 patients were enrolled in this cross-sectional study. In our study, 50%, 18% and 31% had high adherence, moderate adherence and poor adherence respectively. Similar studies were conducted by Fadare et al, Pattoo et al and Yang et al the proportion of patients having high, moderate and low adherence were 17.2%, 38.3%, and 44.5%, 48%, 34%, and 19%, 21.3%, 51.4%, and 27.3%, respectively.[13-15] In other studies that were conducted In Nigeria and Uganda, the prevalence of non-adherence were 21% and 46%.[16,17] Multiple factors are associated with non-adherence to the AEDs among epilepsy patients like low socio-economic status, type of seizuers, number of AEDs, duration of therapy, cost of therapy.[18] 57.8% of the patients among poor adherence

group in the study belonged to lower class socioeconomic status. Urban patients (63.3%) were high adherent to the AEDs as compared to rural patients. It might be because of low education status to release the importance of AEDs and its adherence, low-income source to afford AEDs. Mbuba et al in did the study and revealed factors associated with non-adherence and association of low socioeconomic among poor adherence patients.[19] Males (66.7%) were found to have high adherence as compared to female patients. Liu J et al in 2013 also observed adherence to AEDs among males were more as compared to females.[20] Women were found often more negative than men about the use of drugs in the study conducted by Jung et al. It might be because women are more sensitive to the adverse drug reactions due to these drugs.[21] Furthermore, discontinuation ratio was Generalised seizure were more common as compared to focal seizure in our study. Patients on monotherapy were more adherent as compared on multiple AED therapy but this correlation was statistically not significant. It might be because monotherapy improves adherence by offering better tolerability and avoidance of drug interaction. Chauhan et al from India, Hovinga et al from United State in 2008 and Tan et al from Malaysia revealed in their studies that monotherapy improved the adherence by providing better tolerability and decrease drug interactions .[22-24]

In our study the most common reason for poor adherence was problem in remembering of taking drugs with p<0.001. The 68.3% and 36.8% had problem with sticking and taking the drugs respectively with p<0.001, which was statistically significant. The 42.1% patients were not able to buy drugs which was statistically significant (p<0.001). From all patients who were buying their medication 104 (55.6%) were known to be non-adherent. Mbuba et al conducted the similar study in Kenya and revealed similar results.[19] A similar study conducted by Gurumurthy et al in which 94.6% of poor adherence patients had problem in remembering of drug intake as seen in our study.[25] This is supported by many researchers such as Hasiso and Desse (75.4%), Liu et al (69.6%), Kassahun et al (53.5%), Al-Ramahi argued that forgetfulness is a significant factor affecting the adherence of patients toward their medications, which emphasizes our finding.[26-29]

Limitations

This study is limited by the use of questionnaires, since it is prone to recall bias especially where caregivers or patient report on adherence and are likely to overestimate it.

CONCLUSION

Poor adherence was seen in 50% of our study participants. Illiteracy, low socio-economic status, gender, multiple AEDs, adverse effects are the important parameters of poor adherence to the medication. In our study, patients are not stick to their therapy, buy the drugs or had problem to remember to take their medication. Free supply of AEDs, provision of regular information about significance of treatment may help improve adherence. By improving adherence to AEDs, we can decrease the morbidities and mortality associated with non-adherence.

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