International Journal of Research in Medical Sciences
Gabriel-Job N et al. Int J Res Med Sci. 2022 Oct;10(10):2080-2085
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20222510

Original Research Article

Antiepileptic drug adherence among children with epilepsy attending a tertiary hospital in Rivers state, Nigeria

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Received: 10 August 2022
Revised: 06 September 2022
Accepted: 08 September 2022

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ABSTRACT

Background: Epilepsy is a common neurologic disorder characterized by recurrent unprovoked seizures which can affect the cognitive, social and the psychological wellbeing of a child. Antiepileptic drugs (AED) adherence is necessary for good control of seizure. However, several factors can affect the adherence level among children. This present study sought to determine the factors associated with adherence to antiepileptic drugs among children with epilepsy in university of Port Harcourt Teaching Hospital (UPTH).
Methods: A cross-sectional descriptive study was done among children with a diagnosis of epilepsy attending the Paediatrics Neurology Clinic of the UPTH over a 6-month period from June 2021 to December 2021. AED adherence was determined by self-report of their AED use in the month preceding the study. Descriptive statistics was used for data analysis, test for association between subgroups was carried out using Chi-square test while the difference between means was determined using the Students t-test.
Results: A total of 94 children with epilepsy participated in this study. Forty-nine (52.1%) were females and 45 (47.9%) males. The mean age was 7.34 years. Thirty-eight (40.0%) had seizure control, adherence to AED was found among 39 (41.5%). Age ≤5 years (p-0.04, OR 2.4, CI 1.00-5.50), being a female (p-0.002, OR 2.8, CI 0.18-6.54), patients from upper socioeconomic class (p<0.001, OR 8.8, CI 2.27-29.5), monotherapy (p-0.007, OR 5.4, CI 1.45-19.9) and low monthly income (p-0.03, OR 0.4, CI 0.17-0.90) were factors found to significantly determine adherence to AEDs.
Conclusions: AED adherence is poor among children. Making drugs affordable and available as well as adequate and continuous counselling of care givers and patients is important to ensure adherence to AED.

Keywords: Adherence, Antiepileptic drugs, Epilepsy, Rivers state

INTRODUCTION

Epilepsy is a chronic non-communicable disorder of the brain that affects about 10.5 million children worldwide, with 80% of these children living in developing countries.[1,2] It accounts for over 75% of child neurology clinic presentations and has persistently been prevalent in sub-Saharan Africa due to its relationship with clinical conditions such as perinatal asphyxia and poorly treated central nervous system infections which are common despite several public health interventions.[3,4] The treatment goals in epilepsy include the achievement of good clinical control of seizures, prevention of relapse and drug resistant epilepsy; these require antiepileptic drug (AED) compliance and adherence.[5]

Adherence is defined as the level to which a patient's behaviour including how the medication he or she is taking corresponds with the agreed prescription from the health care provider.[6] As reported by the World Health Organization (WHO), less than 50% of patients with chronic medical conditions in developing countries

adhere to prescribed medications and this may be lower in children who depend on adults for the provision of their essential needs.[6] Studies on AEDs adherence reported variable rates with ranges between 20-80%. These rates are however, much lower among children.[7] In Ethiopia, Dima and Shibeshi recently reported a 65% adherence of AED among children with epilepsy and this poor adherence was related to low family income among other factors.[8]

The differences in the adherence rate reported depends on the study population and the methods used. Due to high cost and unavailability of serum AEDs level estimation, self-report has been the main method of assessing adherence in developing countries as it is affordable and adaptable to the populace, however, it has been reported to overestimate adherence.[7]

Poor adherence to AEDs have been linked to suboptimal seizure control, frequent hospitalization, reduced quality of life of children living with epilepsy as well as avoidable negative psychosocial impact on the parents of affected children.[9,10] Factors that determine adherence to medications among children on treatment includes socioeconomic factors, age, sex, the availability of drugs, ignorance and the level of education of care givers.[8,10] Out of pocket payment for health related conditions and negligible subscription to health insurance services as obtained in most developing countries contributes to poor health seeking behaviours and poor adherence to prescribed treatment.[10]

The extent to which these factors contribute to the adherence to AEDs have not been documented among children with epilepsy in Port Harcourt. This study sought to assess the level of adherence and identify the factors associated with adherence to antiepileptic drugs among children with epilepsy attending the child neurology clinic at the University of Teaching Hospital (UPTH).

METHODS

Study setting

A cross sectional descriptive study was carried out at the Pediatrics Neurology Clinic of the University of Port Harcourt Teaching Hospital. The hospital is located in Rivers State, Southern part of Nigeria. The hospital receives referrals from private and public hospitals within and outside the state as well as self-referrals. The clinic runs every Fridays except on public holidays as an outpatient clinic and attends to children aged less than 18 years with neurologic conditions.

Study procedure/sampling method

Children with a diagnosis of epilepsy who presented to the clinic within the period of study were enrolled for the study, the diagnosis of epilepsy was based on clinical history and examination finding. Electroencephalogram was not mandatory but where available was used to support the diagnosis of epilepsy.

The inclusion criteria were patients who were less than 18 years, who were on anti-epileptic drugs for at least 6 months, whose parents/care giver gave an informed consent and who also assented to the study. While patients who were on AEDs for reasons other than seizures were excluded from the study. Using a convenience sampling method, 94 children on AED who met the inclusion criteria were consecutively enrolled into the study.

Study instrument

An interviewer administered questionnaire was used to obtain socio demographic variables, epilepsy history and information on their AEDs. Adherence to AED was determined by a section of the questionnaire that assessed adherence by self-report over the past one month preceding the study. The self-report involved recalls and or sighting of chart of the patients AEDs use kept by care giver/patients. For children who were 8 years and above who came to clinic with their care-giver/parents their report was considered as well as those of their care-giver. For older patients who come alone their self-report was considered while for children less than 8 years their care-givers/parents report was accepted. A patient was said to have been adherent to AED if at least 85% of their monthly AED was taken the way it was prescribed in the preceding month before the study. The 85% cut of limit for adherence to AED by self-report was adopted from a study by Lisk et al.[11]

Data analysis

Data was analysed using SPSS version 25, descriptive statistics was carried out, and results were presented in frequency tables in simple proportions and graphs. The comparison of mean was by the students t-test and the test for significance was by the chi-square test. The confidence interval was set at 95% and a p value of ≤ 0.05 was considered as significant.

Ethical issues

The detail of the study was explained to the care givers/parents and the children. Informed consent and assent were obtained. Ethical clearance was obtained from the hospital ethic and research committee.

RESULTS

A total of 94 patients participated in the study. Ages ranged from 8months to 17 years. Mean age was 7.34±1.72 years. The mean age for the males was 10.22±4.15 years while that of the females was 4.69±2.94 years. This sex difference in age was statistically significant $t=7.50$, $p<0.001$, there was an equal male to female ratio of 1:1.

Table 1: Socio-demographic variables of participants.

Variables	Frequency (n=94)	Percentages
Ages (years)		
<1	12	12.8
1-5	25	26.6
>5	57	60.6
Total	94	100.0
Sex		
Males	45	47.9
Females	49	52.1
Total	94	100.0
Social class		
Upper	20	21.3
Middle	43	45.7
Lower	31	33.0
Total	94	100.0
Place of residence		
Rural	18	19.1
Urban	76	80.9
Total	94	100.0
Type of care giver		
Mothers	56	59.6
Fathers	12	12.8
Relatives	16	17.0
None relatives	10	10.6
Total	94	100.0
Monthly income		
≤#50,000.00	49	52.1
>#50,000.00	45	47.9
Total	94	100.0

Table 2: Drug use history and co-morbidities.

Variables	Frequency (n=94)	Percentages
Seizure type		
Generalized	68	72.3
Others	26	27.7
Total	94	100.0
Type of therapy		
Monotherapy	78	83.0
Polytherapy	16	17.0
Total	94	100.0
Drug frequency/day		
Once	8	8.5
Twice	77	81.9
Three	9	9.6
Total	94	100.0
Co-morbidities		
Yes	32	34.0
No	62	66.0
Total	94	100.0

Only 20 (21.3%) of the participants came from upper social class while 76 (80.9%) lived in rural area. 68 (72.4%) of the study participants had their parents as their primary care givers with their mothers making up to 59.6% of them. 49 (52.1%) of the care givers/parents earned less than fifty thousand naira every month (Table 1).

Majority of the parents 68 (72.3%) had generalised epilepsy, 78 (83.0%) were on monotherapy while 77 (81.9%) took their drugs twice a day and 62 (66.0%) had other co-morbidity which include cerebral palsy, behavioural disorders and microcephaly etc (Table 2).

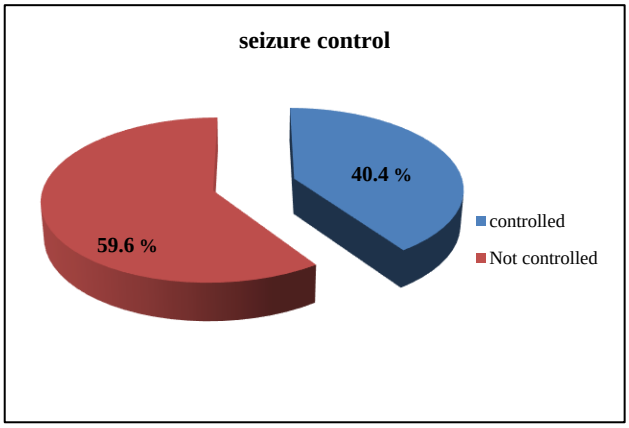

Figure 1: Seizure control among participants.

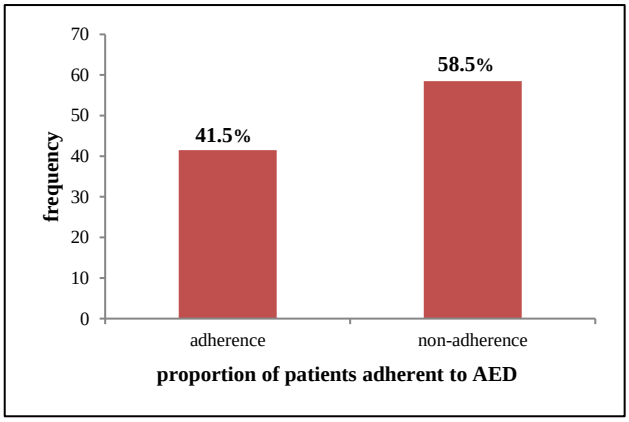

Figure 2: Level of adherence to AED drugs by self-report.

Forty percent of participants had their seizure under control (Figure 1). Figure 2 shows proportion of children who were adherent to their medication, 41.5% of them were adherent to their AEDs. Reasons for missing drugs includes forgetfulness (45.0%), cost of drug (30.0%), unavailability of drugs (17.0%), use of herbal medication or other supplements (6.8%) and while undergoing spiritual exercise (1.2%)

Predictors of anti-epileptic drug adherence among the study participant is as shown in Table 3. Age, sex, social class of the patients, the number of drugs the patient is placed on as well as the family income significantly determined adherence level to AEDs.

Table 3: Factors that determined the adherence to AED drugs.

Variables	Adherence n (%)	Non-adherence n (%)	Total n (%)	χ^2; p value	OR; 95% CI
Age in years					
≤5	20 (54.0)	17 (46.0)	37 (100.0)	3.92; 0.04*	2.2; 1.00-5.50
>5	19 (33.3)	38 (66.7)	57 (100.0)		
Total	39 (41.5)	55 (58.5)	94 (100.0)		
Sex					
Females	26 (53.1)	23 (46.9)	49 (100.0)	5.59; 0.002*	2.8; 0.18-6.54
Males	13 (28.9)	32 (71.1)	45 (100.0)		
Total	39 (41.5)	55 (58.5)	94 (100.0)		
Social class					
Upper	16 (80.0)	4 (20.0)	20 (100.0)	15.36; <0.001*	8.8; 2.7 -29.5
Lower	23 (31.1)	51 (68.9)	74 (100.0)		
Total	39 (41.5)	55 (58.5)	94 (100.0)		
Medication type					
Monotherapy	36(48.6)	38 (51.4)	74 (100.0)	7.26; 0.007*	5.4; 1.45-19.9
Polytherapy	3(15.0)	17 (85.0)	20 (100.0)		
Total	39(41.5)	55(58.5)	94(100.0)		
Income					
≤ #50,000.00	15(30.6)	34(49.4)	49 (100.0)	4.94; 0.03*	0.4; 0.17-0.90
>#50,000.00	24(53.3)	21(46.7)	45 (100.0)		
Total	39(41.5)	55(58.5)	94 (100.0)		
Type of caregiver					
Parents	25 (43.1)	33 (56.9)	58 (100.0)	0.16; 0.69	1.2; 0.51-2.78
Non parents	14 (38.9)	22 (61.1)	36 (100.0)		
Total	39 (41.5)	55 (58.5)	94 (100.0)		
Co-morbidity					
Yes	14 (43.8)	18 (56.2)	32 (100.0)	0.10; 0.75	1.2; 0.48-2.73
No	25 (40.3)	37 (59.7)	62 (100.0)		
Total	39 (41.5)	55 (58.5)	94 (100.0)		

DISCUSSION

Anti-epileptic drug adherence is often a factor that affects the management of childhood epilepsy. Poor adherence levels to AEDs have been reported with non-adherent patients prone to poorly controlled seizures with frequent hospital admissions. Assessing blood level of AEDs is expensive and not readily available in our setting hence, self - reporting can be used. The adherence level of AEDs by self-report of 41.5% in this study is poor, though this finding is much lower compared to finding reported by Dima and Shibeshi and Nazziwa et al who reported 65% and 79.5% respectively.[7,8] This finding indicates that more needs to be done to ensure adherence to AEDs, as lack of adherence is a major cause of unresponsiveness to treatment while on AEDs. Though, Dima and Shibeshi study population were children, they however made use of children who were 14 years and below whose parents may be responsible for administering the drug to them unlike this present study whose study population extended to children up to 18 years, and probably the older the patient the more likely they will take the drugs unsupervised.[8]

Although Nazziwa et al by self-reporting had an adherence level as high as 79.5% among children this did not correspond to their serum AED levels as the latter was as low as 22.1%.[7] This further highlights the need for serum AEDs levels as relying on only self-reporting may not be reliable. Adherence level found in this study is however higher than the finding by Chauhan et al that reported an adherence level of 29% among children on AEDs.[12]

This study found that majority of the children had generalized epilepsy, a finding similar to reports from previous studies.[12-14] In this study we found that younger age, being a female, higher social class, the number of pills the child takes and the family income were determinants of adherence.

Children less than 5 years in this study were more adherent to their AEDs compared to the older ones and this finding was statistically significant. This finding is similar to finding by Nazziwa et al who reported a better adherence among children that were less than 10 years of age.[7] Similarly Shetty et al had reported that adherence declined steadily as the child gets older, and that age was

the only significant factor that determined adherence of AEDs among children.[15] It is possible that caregivers take the responsibility for giving the medication to the young children but less so as a child gets older.

Adherence was better among females in this study compared to the males. This finding is similar to a study from Brazil.[16] Though the Brazilian study population were adults but the sex difference could be a reflection of differences in gender role assigned to females in the society as females may be at home while the males may spend most of their time outside home and may not remember to take his drugs.[17] Also it could be possible that due to the younger age of the females in this present study, their parents/care givers still administer their drugs to them.

Socio economic status of the patients in this study is an important determinant of non-adherence to AEDs as participants from the higher social class were nearly about 9 times more likely to adhere to their AEDs compared to their counterparts from lower social class. This finding collaborates with finding from previous studies.[18,19] Similarly poor family income affected adherence significantly in this present study. This finding is similar to finding by Dima et al.[8] This could be due to the out-of-pocket payment done by most families in our setting and the high cost of the anti-epileptic drugs as parents or caregivers may not be able to sustain these drugs. Abebaw et al had reported that people living with epilepsy who paid for AEDs were more likely to have poor adherence compared to those who got theirs for free.[17]

Number of drugs used for treatment has being an important subject of debate in several studies on adherence.[20,21] This study observed that children who were on one drug were five times more likely to be adherent to their AEDs a finding similar to previous report.[20] As anticipated participants on polytherapy, the pill burden and the cost of multiple drugs may be an issue as well as the side effects they may experience with polytherapy. Pill burden is mainly an issue among children particularly the adolescents who may refuse their drugs with increased number of pills. To reduce drug toxicity among people living with epilepsy the use of single drug for the treatment is the standard management.[19]

The presence of comorbidity was not a significant factor to adherence in this study, this finding collaborates with the findings by Ferrari et al and Abebaw et al.[17,21]

Forgetfulness and the high cost of drugs as found in this study as the commonest cause of missing AEDs was reported in other studies.[8,23,24] The use of medication adherence aid such as installing applications in the caregivers phone to remind them have been suggested, this however may not be achievable in our setting because not all care givers may have access to mobile phones.[8]

Recall bias may be a limitation to this study, however, the patients/caregivers also had records of their AED charts which they presented. The AED charts were thought to be useful but may not be completely reliable

CONCLUSION

This study demonstrates that adherence to AEDs in children is poor. Forgetfulness, high cost of medications were the common reasons given for missing AEDs. Young age, upper social class, being a female and being on monotherapy were the significant factors that determined adherence. Making AEDs affordable as well as adequate and continuous counselling is important to ensure adherence to AEDs among children.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Gabriel-Job N, Wobo KN. Antiepileptic drug adherence among children with epilepsy attending a tertiary hospital in Rivers state, Nigeria. Int J Res Med Sci 2022;10:2080-5.