Socio-Demographic Correlates of Antiretroviral Treatment Adherence among Paediatric HIV Patients Under Care at A Tertiary Health Institution in South-East Nigeria

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ABSTRACT

Background: Antiretroviral treatment adherence is the strongest predictor of successful treatment outcome among HIV-infected patients on treatment. **Objective:** To determine the correlation between the socio-demographic factors of our HIV-infected patients and their antiretroviral treatment adherence, at a tertiary hospital in South-East Nigeria. **Methodology:** This is a cross-sectional survey of 210 HIV-infected children accessing care at a tertiary hospital in South-East Nigeria using self-report method of adherence assessment. Adherence to combined antiretroviral therapy (cART) is defined as when a patient did not miss more than 1 dose of the prescribed cART medication in the preceding 2 weeks prior to the study. **Result:** Majority, 191 (91%), of the subjects adhered. There was a significant relationship between cART adherence and educational level (0.004), duration of treatment (0.001), but not to the socio-economic status (0.001). **Conclusion:** The cART adherence level in this study was 100% in 91% of the subjects studied. There was no statistically significant relationship between cART adherence and the socio-economic status of the subjects.

Keywords: Antiretroviral, Adherence, Socio-demographic, South-east, Nigeria.

INTRODUCTION

Human Immunodeficiency Virus (HIV) infection and the resultant Acquired Immunodeficiency Syndrome (AIDS) has remained a significant public health concern especially in sub-Saharan Africa where it still contributes significantly to childhood morbidity and mortality.[1] There are yet no curative drugs but the use of combined antiretroviral therapy

(cART) has ensured better outcomes. Combined antiretroviral therapy consists of the use of mostly three antiretroviral agents, and good adherence is the most important determinant of success and positive outcome.[2]

With regard to antiretroviral therapy (ART), an adherence level of 95% or more is required in order to obtain successful outcome.[3,4] Non-adherence can lead to incomplete viral suppression, emergence of resistant viral strains, and treatment failure[5] Paediatric adherence relies not only on the child but also on his/her caregiver and as such is especially challenging[6,7,8,9,10].

Given that adherence is the strongest predictor of successful treatment outcome, a clear understanding of the relationship between subjects' socio-demographic correlates and cART adherence is very crucial in the bid to develop measures to support and sustain patients' drug adherence in the clinical care of HIV-infected children[2]

Several methods have been used to measure adherence and they include Therapeutic Drug Monitoring (TDM), Directly Observed Therapy (DOT), Pill counts, Self-report respectively and others.[11,12,13,14] It is very important to emphasize here that there is no `gold standard` for assessing cART adherence, and rates may differ depending on the method used.[13,14,15]

In the self-report method, the older patient or caregiver (in the case of younger child) gives information on how the drugs are taken and reports on missed doses. This method hinges on the client providing true and accurate information.[14]

This study was carried out to assess the relationship between subjects' socio-demographic factors and cART adherence at the Paediatric HIV Clinic of the Federal Medical Centre, Owerri, South-East Nigeria.

METHODOLOGY
Study Design and Setting
This was a cross sectional hospital based study of 210 children aged ten to 180 months attending the Paediatric HIV Clinic of the Federal Medical Centre Owerri, South-East, Nigeria.

Federal Medical Centre Owerri is one of the tertiary institutions in Imo state and SouthEast Nigeria. The hospital is a multidisciplinary health facility which provides health services for clients from Imo state, and neighboring Abia, Anambra and Rivers states. The Centre has a comprehensive Paediatric HIV care and treatment clinic which receives logistics and technical support from Clinton foundation and Family Health International. It attends to an average of forty-five HIV children every week who are either on treatment (on ART) or as HIV exposed babies. Counseling, nutritional assistance, psychological support and social support are also provided by the Clinic.

Ethical Considerations
Ethical approval was obtained from the Research and Ethics Committee of Federal Medical Centre, Owerri. Informed written consent/assent was obtained from the caregivers/ children.

Sample Size Determination
The sample size was determined with the formula

$$N = \frac{Z^2 Pq}{d^2}$$

Where; N = Minimum sample size,
Z = Standard normal deviation taken to be 1.96 at 95% confidence level
P = Prevalence of ART adherence which is 86% from a study done in south- west Nigeria[16]
q = 1-P
d = degree of accuracy = 0.05

$$N = \frac{(1.96)^2 \times 0.68 \times 0.14}{(0.05)^2}$$

= 185
Considering 10% attrition rate, sample size will be

203. Thus minimum sample size was 203.

Data Collection

Data were collected with a pre-tested interviewer administered questionnaire. The information sought for included the caregiver's related factors such as age, educational level, occupation, relationship to subject, and treatment duration. Also the patient's related factors like age, gender, education, orphan status and missed medication(s) were sought. Adherence here was determined using the self-reporting method. Adolescent patients and parents/caregivers (for the younger subjects below 10 years of age) were asked to recall how many times they missed their drugs as prescribed in the last two weeks preceding the study. Patients were classified as having cART adherence if they scored ≥95% (not missing more than 1 dose in the last 2weeks). Social class was determined using the socioeconomic indices of the parents as described by Oyedeji[17]

Data Analysis

The data from the questionnaire was cleaned and analyzed using the SPSS version 20.0, Chicago, Illinois, USA. The data was further subjected to descriptive and analytical statistics to generate frequencies and percentages. Chi square was used to test for association between two categorical variables. P-value < 0.05 was considered to be statistically significant.

RESULTS

A total of 210 patients who met the inclusion criteria were recruited for the study. Of these, 108 (51.4%) were males and 102 (48.6%) were females giving a male to female ratio of 1.05:1. Their age ranged from 10 to 180 months. Those in the age range between 60 to 119 months constituted the largest proportion (36.7%). One hundred and six (50.6%) have been on treatment for 12 to 35 months while 12 (5.7%) have been on treatment for less than 12 months. Table 1 shows the general characteristics of the subjects. One hundred and forty-six (69.5%) had their drugs administered by their biological parents, while 64 subjects (30.5%) lost one of the parents each, and 22 (10.5%) lost both. One hundred and ninety-one (91%) had 100% adherence and 12 (5.7%) had 95% adherence. Seven (7), 3%, were non-adherent. There was a significant association between adherence and subjects' educational level ($p = 0.004$) and duration of treatment ($p = 0.001$).

One hundred and nine (58.3%) of the caregivers were aged between 3050 years and 90 (48.1%) had tertiary education. Ninety-eight (52.4%) were males while 55 (29.4%) were of the social class V. Table 2 shows the sociodemographic characteristics of the caregivers.

Table 1: General characteristics of the Subjects (n =210)

Characteristics	Number (n=210)	Adh(191)	NAdh(19)	Chi-square	p value
Age (months)					
10 -12	3 (1.4%)	3	0	6.32	0.097
13 – 59	59 (28.1%)	57	2		
60 – 119	77 (36.7%)	71	6		
120-180	71 (33.8%)	60	11		
Gender					
Male	108 (51.4%)	97	11	0.12	0.750
Females	102 (48.6%)	94	8		
Educational level					
None/pre-Primary	65 (31.0%)	64	1	10.81	0.004*
Primary	85 (40.5%)	78	7		
Secondary	60 (28.5%)	49	11		
Treatment duration (months)					
<12	12 (5.7%)	12	0	29.91	0.001*
12 – 35	106 (50.6%)	103	3		
35 – 59	68 (32.4%)	61	7		
>60	24 (11.4%)	13	9		
Who administered the medication?					
Self (age ≥11years)	26 (12.4%)	19	7	12.60	0.006
Biological parent	146 (69.5%)	138	8		
Biological grandparent	31 (14.8%)	28	3		
Others (aunt, 1familyfriend)	7 (3.3%)	6	1		
Orphan status					
Both parents alive	124 (59.0%)	117	7	23.30	0.001*
One parent alive	64 (30.5%)	50	4		
Both parents dead	22 (10.5%)	14	8		
Missed doses (last 2 weeks)					
None	191 (91%)			140.87	0.001*
Yes	19 (9%)				
	12 1 dose} 7{>1dose}]				

Adh =Adherence;   *NAdh*= Non -adherence;   * *statistically significant*

Table 2. Socio-demographic characteristics of the caregivers that administered drugs to the subjects (n= 184 i.e. 210– 26 self-administrators)

Characteristics	Number(n=184)	Adh(172)	NAdh(12)	Chi-square	p value
Age (years)					
<30	34(18.2%)	31	3	15.96	0.001*
30 – 50	109(58.3%)	108	1		
>50	44(23,5%)	36	8		
Gender					
Male	98(52.4%)	92	6	0.001	1.000
Female	89(47.6%)	83	6		
Educational level					
Primary	15 (8.0%)	12	3	5.66	0.059
Secondary	82(43.9%)	79	3		
Tertiary	90(48.1%)	84	6		
Occupation					
Civil service	73(39.0%)	69	4	1.32	0.520
Self- employed	99(52.9%)	93	6		
Unemployed	15(8.0%)	13	2		
Social class					
I	23(12.3%)	21	2	4.51	0.340
II	32(17.2%)	31	1		
III	27(14.4%)	233	4		
IV	50(26.7%)	48	2		
V	55(29.5%)	52	3		
Relationship to patient					
Biological parent	146(78.1%)	138	8	0.98	0.61
Biological grandparent	31(16.6%)	28	3		
Others (aunts 9, family friends 1)	10(5.3%)	9	1		

Adh =Adherence ;   *NAdh* = Non – adherence ;   * =*statistically significant.*

DISCUSSION

The adherent rate of 91% in the present study is higher than those documented by Iroha *et al*[16] in Lagos, Mukhtar-Yola *et al*[18] and Zubayr *et al*[19] both in Kano State Nigeria where they documented adherence rates of 86%, 80%, and 91% respectively. However, this finding is lower than that documented by Ugwu and Eneh in Port-Harcourt, Nigeria.[20] Even though these studies all employed the used of self-reporting method in assessment of adherence, the lower adherence rates found in both Kano and Lagos studies may be attributable to the sample sizes and shorter periods of medication adherence assessment in the two studies. Conversely, the higher adherence rates reported by Ugwu and Eneh may be due to the longer recall period employed in their study. [20] Whereas the present study assessed adherence by recall over the two weeks prior to the study, Ugwu and Eneh assessed adherence by recall over a one-month period.[20]

Importantly, adherence was found to be decreasing with increasing age and this is in agreement with finding from other studies[21,22] This is understandable as children would likely not takes drugs every day over a long period of time either because of peer pressure or due to the tedious nature of swallowing pills every day. Despite socio-cultural preference for male child by the Igbos of South-Eastern and the Yorubas of South-Western Nigeria, this study observed higher adherence among the females than males, although the difference was not statistically significant (*p*= 1.00). This observation is similar to earlier reports in Port Harcourt and Kano states of Nigeria. [19,20] The implication is that gender may not have any influence cART adherence.

Adherence was higher in patients whose biological parents administered the drugs when compared to those administered by other relatives. and this was statistically significant. This finding is in agreement with the Kano study.[18] The usual bonding between parent and their children could explain this.

Adherence to medication was found to be better among secondary school certificate holders than other educational classes. The study also found a better adherence among children whose parents or caregivers were civil servants than the other occupational classes. Even though there were no immediate explanation for these, however, these findings were not statistically significant.

There was no positive correlation between adherence and the socio-economic status of the parents/caregivers and adherence to treatment. Mohammed *et al*[23] in a study in rural Louisiana documented similar finding. Also, Singh et *al*,[24] in a multicenter study of Caucasians and the Non-Caucasians population found no statistical relationship between the social class and adherence to cART treatment. This could mean that irrespective of social class parents and caregivers are eager to make sure that their children are adherent. Conversely, Weiser *et al*[25] in Botswana study observed a statistically significant relationship between the components of the socio-economic status and cART adherence but not with social class status in general.

CONCLUSION

The adherence level in this study was 100% among 191(91%) of the subjects studied, 12(5.7%) reported 95% adherence while 7(3.3%) were non-adherent. Most of the subjects were from the lower socio-economic class. In general, the socio-economic status of the subjects in this study has no statistical co-relation with their cART adherence.

Disclosure
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