

## Assessment of Rate of Adherence to Highly Active Antiretroviral Therapy (HAART) among HIV Infected Children Attending the Infectious Disease Clinic of Federal Teaching Hospital Abakaliki (FETHA), Ebonyi State, Nigeria

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### Abstract

**Background:** Drug adherence is central to the success or failure of antiretroviral therapy. It is therefore the pillar in HIV management. This study was aimed at assessing the level of adherence to highly active antiretroviral therapy (HAART) among HIV infected children attending the infectious disease clinic of FETHA. It was also aimed at determining factors influencing adherence among participants.

**Methods:** It was a cross sectional descriptive study, carried out in FETHA between April and October 2014. A structured questionnaire was used to obtain medical history. Adherence was assessed in the clinic using self/caregiver report through questionnaire, objectively counting the remaining pills of previous prescription and checking the pharmacy refill forms. Analysis of data was done using SPSS version 20. Level of significance was achieved if  $p < 0.05$ .

**Results:** Of the 77 children recruited, 47 (61.0%) were males. A total of 60 (77.9%) children were found to be adherent to ART by pill count and 68 (88.3%) by self-report. Majority of the non-adherent participants were adolescents (78.6%). A significant relationship existed between death of parent (s) and adherence to ART ( $p < 0.028$ ).

**Conclusion:** The study shows poor adherence to ART is common and that adolescents are the worst defaulters, with death of parent(s) being the prevailing factor.

**Keywords:** HAART; Adherence; Challenges; Children

### Introduction

Antiretroviral drugs reduce the ability of the virus to replicate thereby increasing the ability of the body to fight the infection [1]. Although ARTs do not provide cure for HIV infection, strict adherence to medication, is associated with sustained HIV suppression, reduced risk of HIV transmission and drug resistance, reduced risk of opportunistic infections, along with improved quality of life and survival of HIV infected subjects [2]. Adherence to HAART in children is faced with numerous challenges. One of such challenges is the fact that children are largely dependent on their caregivers for their healthcare needs [1]. Therefore caregivers have a major role to play in adherence in children. Adherence counselling with primary and secondary caregivers is usually instituted before commencement of ART. Adherence to medication is difficult to measure accurately [3]. When a patient that is initiated on HAART, fails to achieve viral suppression by 24 weeks of treatment, there is possibility of suboptimal adherence, although other factors may be contributory [1]. Chesney [3] in her study reported that poor adherence to medication correlated with virologic failure. Viral load suppression is one of the reliable

indicators of adherence. But test for viral load is expensive and equipment not readily available in most health care facilities in the developing countries [3,4]. Patient self-report is frequently used for evaluating medication adherence in health care centres, other methods of medication adherence include pill count and pharmacy refill cards. There is actually no gold standard for assessing adherence to HAART, any of the validated tools and assessment strategies can prove valuable if properly implemented [5]. Patient self-report assumes that patients are honest and can remember accurately their behavior [3]. It is most reliable when there is acknowledgement of poor adherence, when queries are non-judgemental of poor adherence and with simple standardized surveys for doses taken in the past one week at each clinic visit [6]. It can be falsely given because of fear of being scolded by the attending paediatrician and on the other hand, when the paediatrician is seen to show concern, friendly and caring, the self-report can be reliable. It has an advantage of being cheap and flexible. Ugwu et al. [7], carried out a study of adherence level among 213 HIV infected children using self-report of caregiver and reported an adherence level of 76.1%. Biressaw et al. [8], carried out a cross sectional study among 210 HIV infected children, and noted that caregiver-reported in the past 7 days prior to interview was reported as 93.3%, while adherence using unannounced home-based pill count done 7 days after the

interview was 34.8%. Other studies using caregiver's/ patient's reports had prevalence rates between 80.9% and 83.4% [9,10]. Pill count is done during patients' visit to the health facilities or unannounced at patients' home. This technique is cheap and correlates well with adherence measured using viral load [11]. Its major drawback is manipulation of pills by the patients in order to impress the healthcare providers. Pill dumping prior to hospital visit may overestimate adherence for the patient. Unannounced pill count is more reliable but it has the tendency to affect the trust between the patient and the healthcare provider which may eventually hinder adherence [12]. Nsheha et al. [13] used 3 methods to assess adherence namely self-report 148 (80.9%), visual analogue scale in 136 (73.4%), and by pill count in 64 (35.0%). Only 45 (24.6%) patients had good adherence when subjected to all measurements.

### Pharmacy refill cards

This entails cross checking the amount of drugs dispensed to the participants by the pharmacist per clinic visit. This ensures that the participant received the prescribed medication. Drug adherence is taking medications (ART) without missing doses and giving them at the right time and in the right way following an agreed plan. Greater than 95% adherence to the drug regimen will ensure good virologic response and prevent emergence of resistance [1]. For a child taking medication twice daily, omitting more than one dose in ten days is less than 95% adherence [1]. Study by Ugwu et al. [7] identified factors such as forgetfulness, travelled, drugs finished, caregiver ill, child refused drugs, slept off; While Biressaw et al. [8], reported caregivers' forgetfulness and child's refusal as significant factors to non-adherent to medication. Other studies reported child being depressed, drug side effects, too many pill and difficulty in swallowing pills and caregivers' formal education as significant factors [9,10]. This study was aimed at determining the rate of adherence to antiretroviral therapy (ART) in children attending the ART clinic and also to determine the factors that influenced non-adherence.

### Method

#### Study setting

It was a cross sectional and descriptive, conducted in the ART clinic of Federal Teaching Hospital Abakaliki (FETHA), Ebonyi state. The study was conducted between April and October 2014.

#### Study population

HIV infected children attending the infectious disease clinic of FETHA. The participants were recruited consecutively until sample size was met.

#### Study design

ART adherence was assessed using the following tools: self-report / report of caregiver, pill count and pharmacy refill records.

#### Data collection tools

A structured interviewer administered questionnaire was used to obtain history on bio-data, socio-demographic variables, duration of

ART usage, self/caregiver report on missing doses and factors influencing adherence. If three or less doses were missed in the previous one month, it was recorded as good adherence ( $\geq 95\%$  adherence). When 4-8 doses were missed, adherence was said to be fair (85-94% adherence). Missing 9 or more doses was recorded as poor adherence ( $< 85\%$  adherence). Patients are encouraged to come to clinic with their pill containers. Pills are counted in the clinic and assessment of adherence using pill count noted. For patients on monthly clinic appointments, drugs for 30 days are given, and appointment scheduled for 4 weeks, so that pills for 2 days should be left in the container. Those on bi-monthly appointment should have pills for 4 days left over in their containers. Patient was judged to have fair adherence when 5-10 and 9-16 pills were found in the container for monthly and bi-monthly prescriptions. When more than 10 and 16 pills for monthly and bi-monthly prescription were remaining in their containers, adherence to HAART was poor. Any patient that presented to the clinic with empty container was judged to have poor adherence to HAART if he/she has not had drugs for a week based on clinic appointment. The pharmacy refill records were also checked to be certain that patient received the prescribed medications.

### Data analysis and management

These were done using SPSS version 20. Level of significance was achieved if  $p < 0.05$ .

### Ethics

Ethical approval was sought and obtained from the health and ethical management committee of the Federal Teaching Hospital Abakaliki (FETHA). Informed consent was obtained from the caregivers or the older patients themselves and clinical investigation was conducted according to the principles expressed in the Helsinki Declaration. Socio-economic classification of caregivers into upper, lower and middle classes were determined using Olusanya et al. [14].

### Results

#### Socio-demographic variables

A total of 77 HIV infected children attending the infectious disease clinic were consecutively recruited during the study period of 4 months, with males accounting for 61% (46 out of 77) of the total population. Male to Female ratio was 1.6:1. The age range of study participants was 2-17 years. As shown in Table 1 below, Majority of the participants with poor adherence were 10 years and above (78.6%). Most of the participants that had fair and poor adherence rates to medication were from lower social class. Social class however had no significant relationship to adherence.

More participants were adherent to medication by self-report (88.3%) when compared to that by pill count (77.9%) as shown in Table 2. It was also observed that majority of the participants (11.7%) that had poor adherence to medication were on monthly medication. A total of 3 participants presented to clinic with empty containers and were judged to be poorly adhering to medication as they had missed drugs for more than a week.

Sociodemographics	Good adherence (≥95%)	Fair adherence (85-94%)	Poor adherence (<85%)	p
Sex				
Males	36 (60.0)	2 (66.7)	8 (57.1)	0.785
Females	24 (40.0)	1 (33.3)	6 (42.9)	
Age (years)				
<5	3 (5.0)	0 (0.0)	1 (7.1)	
5-9	27 (45.0)	1 (33.3)	2 (14.2)	0.194
≥10	30 (50.0)	2 (66.7)	11 (78.6)	
Social class				
Upper	5 (8.3)	0 (0.0)	0 (0.0)	
Middle	21 (35.0)	0 (0.0)	5 (35.7)	0.167
Lower	34 (56.7)	3 (100.0)	9 (64.3)	

**Table 1:** Socio-demographic variables and adherence assessment by pill count.

Methods of adherence assessment	Good adherence (%)	Fair adherence (%)	Poor adherence (%)	Total
Pill count				
Monthly prescription	46 (59.7)	2 (2.6)	9 (11.7)	57 (74.0)
Bi-monthly prescription	14 (18.2)	1 (1.3)	2 (2.6)	17 (22.1)
Empty container			3 (3.9)	3 (3.9)
Total	60 (77.9)	3 (3.9)	14 (18.2)	77 (100)
	Missed doses			
Self-report	≤3 doses	4-8 doses	≥9 doses	
Total	68 (88.3)	6 (7.8)	3 (3.9)	77 (100)

**Table 2:** Assessment of adherence using pill count and self-report.

Sex	Age groups (in years)	Stigma (%)	Death of parent(s) (%)	Side effects of medication (%)	Forgetfulness (%)	No formal education of caregiver (%)
Male	<5	0 (0.0)	1 (5.9)	0 (0.0)	0 (0.0)	1 (5.9)
	5-9	1 (5.9)	1 (5.9)	2 (11.8)	1 (5.9)	3 (17.6)
	≥10	2 (11.8)	4 (23.5)	0 (0.0)	1 (5.9)	1 (5.9)
Female	<5	0 (0.0)	0 (0.0)	1 (5.9)	0 (0.0)	1 (5.9)
	5-9	1 (5.9)	1 (5.9)	0 (0.0)	0 (0.0)	2 (11.8)
	≥10	4 (23.5)	5 (29.4)	0 (0.0)	2 (11.8)	3 (17.6)
Total		8 (47.1)	12 (70.6)	3 (17.6)	4 (23.5)	11 (64.7)

P		0.076	1.67	0.028	2.072	1.98
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**Table 3:** Factors attributed to non-adherence to HAART by age and sex.

### Factors influencing adherence to HAART

As shown in Table 3, death of parent (s) was the most important factor that influenced non-adherence to medication in the study population. This accounted for 23.5% and 29.4% of male and female adolescents respectively that were non-adherent to medication. Stigma was a major problem among female adolescents, although no significant relation was noted.

### Discussion

Adherence to medication cannot be over emphasized as it is vital to the success of antiretroviral medication. This study, like most other studies reviewed showed that adherence to medication in the paediatric age group is still sub-optimal. The adherence rate in this study was found to be 77.9% (pill count) and 88.3% (self-report). The adherence rate by self-report is comparable to that reported by Eticha et al. [9] (80.9%) and Azmeraw and Wasie [10] (83.4%), but slightly higher than that reported by Ugwu et al. [7] (76.1%). This difference may be explained by the differences in sample size. The adherence rate reported by pill count assessment in this study was by far higher than that reported by Biressaw et al. [8] (34.8%) and Nsheha et al. [13] (35.0%). This buttresses the fact that health facility based pill count, though an objective tool for adherence assessment, is not as accurate as unannounced home visit for pill count assessment. The later however, has the tendency to undermine trust between caregiver and health care provider, which may ultimately affect adherence negatively [12].

Age, sex and socio-economic class had no significant relationship with adherence in this study. This is also consistent with findings by Ugwu et al. [7] and Eticha et al. [9]. Majority of the participants who had poor adherence assessment were adolescents (78.6%). This may probably be attributed to the peculiarities in this age group. Early disclosure and consistent adherence counselling may suffice for the adolescent age group. Death of parent(s) was a significant risk factor for poor adherence to medication in this study, this was unlike that reported by most studies reviewed [7-13]. This may be explained by the practice of handing over the healthcare of children infected with HIV to their uncles, aunts and grandparents when their parent(s) die. These secondary caregivers may never have been part of the adherence counselling sessions, hence may not know the nature of disease and benefits of consistent medication. They may also not be willing and committed to patients' care as they may have other distractions from immediate households. Other studies that did not document death of parent(s) as a factor affecting adherence may not have explored it in their research. Forgetfulness was a significant factor affecting adherence in studies by Ugwu et al. [7] and Chesney [3], but did not influence adherence in this study. Also observed in this study was that poor adherence was common in HIV infected children on monthly prescription for HAART. This may probably be due to the death of parent(s) and consequent change of child's caregiver to a relation, who may not know the nature of disease and benefits of coming to clinic every month. Also, financial implication in transporting subjects to the hospital monthly may be an issue, as majority of the subjects were from lower socio-economic class. This underscores the need for

disclosure and counselling of primary, secondary and even tertiary caregivers of the HIV infected child before commencing HAART.

### Conclusion

Adherence to HAART in this study is suboptimal, strategies to improve adherence will entail establishing a functional adolescent friendly health facility, caregiver education and empowerment for better HIV management of their children/wards.

### Limitations of the Study

Viral load suppression is one of the reliable indicators of adherence. But test for viral load is expensive and equipment not readily available in our centre hence it was not employed as a tool for assessing adherence in this study.

### References

- Nwandu A, Elom I, Oguiche S, Asadu E (2011) National Guideline for Paediatric HIV and AIDS, Treatment and Care. Federal Ministry of Health of Nigeria pp: 9-43.
- Hogg RS, Yip B, Kully C, Craib KJ, O'Shaughnessy MV, et al. (1999) Improved survival among HIV-infected patients after initiation of triple-drug antiretroviral regimens. *CMAJ* 160: 659-665.
- Chesney MA (2000) Factors affecting adherence to antiretroviral therapy. *Clin Infect Dis* 30 Suppl 2: S171-176.
- Niewkerk P, Gisolf EH, Van Leeuwen R, Danner SA, DeBoer JB, et al. (1998) Self-reported adherence to ritonavir/saquinavir and ritonavir/saquinavir/stavudine in a randomized clinical trial: Program and abstract of the 12th World AIDS Conference. Geneva: Marathon Multimedia.
- Bartlett JG, Gallant JE, Pham PA (2009) Factors that influence probability of prolonged viral suppression. In: Landay JL, Hadden DD (1st Edn.) 2009-2010 Medical management of HIV infection pp: 89-92.
- Eldred LJ, Wu AW, Chaisson RE, Moore RD (1998) Adherence to antiretroviral and pneumocystis prophylaxis in HIV disease. *J Acquir Immune Defic Syndr Hum Retrovirol* 18: 117-125.
- Ugwu R, Eneh A (2013) Factors influencing adherence to paediatric antiretroviral therapy in Portharcourt, South-South Nigeria. *Pan Afr Med J* 16: 30.
- Biressaw S, Abegaz WE, Abebe M, Taye WA, Belay M (2013) Adherence to Antiretroviral Therapy and associated factors among HIV infected children in Ethiopia: Unannounced home-based pill count versus caregivers' report. *BMC Pediatr* 13: 132.
- Eticha T, Berhane L (2014) Caregiver-reported adherence to antiretroviral therapy among HIV infected children in Mekelle, Ethiopia. *BMC Pediatr* 14: 114.
- Azmeraw D, Wasie B (2012) Factors associated with adherence to highly active antiretroviral therapy among children in two referral hospital, northwest Ethiopia. *Ethip Med J* 50: 115-124.
- San Lio MM, Carbini R, Germano P, Guldotti G, Mancinelli S, et al. (2008) Evaluation of adherence to highly active antiretroviral therapy with use of pill count and viral load measurement in the drug resources enhancement against AIDS and malnutrition program in Mozambique. *Clin Infect Dis* 46: 1609-1616.
- Hales G, Mitchell J, Smith DE, Kipper S (1998) Validity of patient questioning versus pill count as an assessment of compliance. Program

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- and abstract of the 12th World AIDS Conference. Geneva: Marathon Multimedia.
13. Nsheha AH, Dow DE, Kapanda GE, Hamel BC, Msuya LJ (2014) Adherence to antiretroviral therapy among HIV-infected children receiving care at Kilimanjaro Christian Medical Centre (KCMC), Northern Tanzania: A cross sectional analytical study. *Pan Afr Med J* 17: 238.
14. Oyedeji GA (1985) Socio-economic and cultural background of hospitalized children in Ilesha. *Nig J Paediatr* 12: 111-117.