https://www.jnids.org ISSN: 2971-5059

Journal of the Nigerian Infectious Diseases Society

Original Article

Human Immunodeficiency Virus Disclosure and Viral Load Suppression Statuses of Adolescents Living with HIV: A Cross-sectional Study in Lafia, Nigeria

Bello SO[1]*, Audu ES[2], Hassan II[3], Ogunkunle TO[1], Anazodo MC[3], Odonye CE[3], Isah YO[4], Ibrahim TL[1], Lawal AA[5], Adeyemi A[3], Dalhat M[6]

1. Department of Paediatrics, Dalhatu Araf Specialist Hospital, Lafia Nasarawa State.
2. Department of Medical Microbiology, Dalhatu Araf Specialist Hospital, Lafia Nasarawa State.
3. Department of Community Medicine, Dalhatu Araf Specialist Hospital Lafia Nasarawa State.
4. Department of Family Medicine, Dalhatu Araf Specialist Hospital, Lafia Nasarawa State.
5. Department of Anatomy, College of Medicine, Federal University Lafia, Nasarawa State.
6. Infectious Diseases Control Centre, Kaduna Kaduna State.

***Corresponding author:**

surajudeenbello4@gmail.com

Received: 30 April 2023
Revised: 21 June 2023
Accepted: 11 July 2023
Published: 31 October 2023

DOI
10.58539/JNIDS.2023.2115

Quick Response Code:

Abstract

Introduction: Adolescents are faced with challenges such as knowing their HIV status, risks of transmission, and consequently poor viral suppression. We determined the age of disclosure and its impact on viral load.

Objectives: A cross-sectional study to determine the age of HIV disclosure, the prevalence of HIV status disclosure, and viral suppression among adolescents in Lafia, Nigeria.

Methods: We sequentially recruited 119 adolescents with HIV for six months at a tertiary healthcare facility in Lafia, Nasarawa State, North-Central Nigeria. An interviewer-administered questionnaire was used to gather information on adolescents/caregivers from January to June 2021. We calculated frequencies and percentages of categorical variables, mean and standard deviation of continuous variables, and bivariates analysis. P-value < 0.05 was considered significant.

Results: A mean age at HIV disclosure of 17.0 ± 4.8 years was found while the perceived safest age for disclosure was 11–15 years. A total of 90.8% were on first-line antiretroviral therapy (ART) with 79.8% on Tenofovir/Lamivudine/Dolutegravir combination; and none on third line ART. We found good adherence among 79.0% of participants and 84.0% were virally suppressed. Adolescents with good adherence to ART have four-fold odds of being virally suppressed (OR: 4.2; 95% CI: 1.1–3.6). However, the child's age (OR: 1.2; 95% CI: 0.1–10.7) and parents being alive (OR: 0.7; 95% CI: 0.2–2.9) were not statistically significant.

Conclusions: There is a high frequency of HIV disclosure in our population but the average age at HIV disclosure was in late adolescence. Most participants have good adherence to ART and good viral suppression. Good adherence to ART was a significant determinant of viral suppression. Public health measures to ensure HIV disclosure at an earlier age are recommended.

Key words: Adolescents, Disclosure, HIV status, viral suppression, Nigeria.

INTRODUCTION

In 2019, 1.8 million adolescents were living with Human Immunodeficiency Virus (HIV) among which 250,000 were newly infected with 38,000 deaths per year.[1] With over 90% of Paediatric HIV acquired via Mother To Child Transmission (MTCT).[2] Perinatal HIV remained a huge burden globally.[3] The situation is particularly worse in Africa were it accounted for two-third of new HIV infections and more specifically Nigeria, the second largest country with Paediatric HIV.[4]

Modest achievements attained in the Prevention of Mother-To-Child Transmission of HIV leads to improved survival and life elongation to the adolescents' age groups and beyond.[5, 6] Further survival of this cohort depends on how they effectively transit through the adolescent to the adult age group. The adolescents are individuals aged 10 – 19 years and are faced with other enormous challenges that includes knowing their HIV status, age of disclosure, risks of transmission and reproductive behavior.[3] It is thus pertinent to evaluate and seek to address some of the challenges confronting this important group with inquisitive minds. This will enhance the sustenance of prevention and care of HIV infected adolescents.[6]

A study in Kenya in 2014 had reported that disclosure to siblings, families, colleagues, close friends and partners have been found to improve adherence to anti-retroviral medication and consequently, treatment outcome.[7,8] Despite the benefits of disclosure, certain parameters like the age, psychosocial maturity and family dynamics among others, contribute towards overall outcome among HIV infected adolescents.[9]

Good adherence ensures patients well-being as they live without symptoms, opportunistic infections are prevented and are virally suppressed.[10] The factors responsible for viral suppression need to be established as being virally suppressed is a cardinal target of HIV treatment and care.[11] There is dearth of local study on virological suppression and its determinants among HIV infected adolescents, with most studies conducted predominantly in the East African countries and few from Nigeria.[7,12,13] We conducted a descriptive cross-sectional study to determine age at HIV disclosure, prevalence of HIV status disclosure and viral load suppression among adolescents living with HIV in Lafia Nasarawa State Nigeria.

MATERIALS AND METHODS

Study Design

A prospective cross-sectional study of adolescents living with HIV in Lafia Nasarawa State from 1st January to 30th June 2021

Study Population / Site

The study population consisted of Adolescents aged 10 – 19 years accessing HIV treatment and care at the Dalhatu Araf Specialist Hospital for a period of 6 months. The Dalhatu Araf Specialist Hospital is situated in Lafia, the capital of Nasarawa State.

It is the only state-owned tertiary health facility having an Adolescent and Youth Friendly (AYF) Centre in addition to the Special Treatment Clinic (STC). The centre was established over a decade ago, furnished with recreational and vocational facilities such as Table

Tennis, Snooker, Ludo and Sewing Machines among others, with support from Institute of Human Virology Nigeria. It accommodates all adolescents irrespective of their HIV status. The centre holds meetings on the first Saturday of every month during which they were educated on reproductive health, general health awareness sensitization and counseling. Their questions and concerns were also addressed as necessary. They were counseled on need to know their HIV statuses, consenting Adolescents offered free HIV test, those with positive results were enrolled into care after confirmation and post-test counseling. The Special treatment clinic houses the facility's HIV treatment and care centre. The adolescents HIV clinic holds every Tuesday while other children with HIV as well as the exposed babies' clinic takes place every Wednesdays. There were two consultants (a Paediatrician and a Medical Microbiologist), a Principal Medical officer and two Paediatric residents attending to the care of these children and the Adolescents. Other available staffs include the Nurses, Clinical Psychologists, Medical record staffs, data entering staffs, adherence counselors, tracking officers and health attendants.

Inclusion Criteria

Adolescents aged 10 – 19 years that are in care for a period of 6 months or more were included while those that declined consent and or assent were excluded from the study.

Sampling Technique

A convenient sampling technique was used.

Data Collection

We used an interviewer-administered questionnaire to collect data on socioeconomic status, age of disclosure, perceived parents / care-givers most appropriate age for HIV status disclosure, adherence status, viral load et cetera. This questionnaire was pre-tested by pilot study and administered by two trained research assistants who are resident doctors in the department.

Outcome

1. Age of HIV disclosure
2. Viral suppression level and factors affecting it

Definition of Terms

1. Viral suppression is defined as having less than a thousand copies of viral particles in the blood.
2. Orphan refers to children that have lost both of their parents.
3. HAART Adherence status is deemed good, fair or poor when it is > 95%, 85 - < 95% and < 85% respectively.

4. Viral load is considered un-suppressed when there are > 1000 copies/ml.
5. Viral load is termed suppressed when there are < 1000 copies/ml. This is further re-classified as low level viraemia and undetectable when the viral load is 20 – 999 copies/ml and < 20 copies/ml respectively.
6. HAART means highly active anti-retroviral therapy

Ethical Considerations

Ethical approval was sought and obtained from the Dalhatu Araf Specialist Hospital (DASH) Research Ethics Committee (DASHREC/0130). The purpose of the study was explained to the adolescents. Those that gave a written and informed consent were enrolled into the study. An interviewer administered questionnaire was used. Participation in the study was voluntary without threat or coercion. Privacy and confidentiality were ensured through use of de-identifiers and codes to ensure no one (except the researchers) can identify the participants' information. This was further stored in a pass worded mini-computer and made available for the researchers use.

Data Management and Analysis

The coded data was entered into an excel spreadsheet before transferring to a Statistical Package for Social Sciences (SPSS) version 20. Categorical variables were presented using frequency and percentages. The means and standard deviation of continuous variables was determined. Associations between categorical variables were determined using chi square test. Correlation and regression analysis was done to determine the determinants / predictors of viral suppression among HIV infected adolescent. Results were presented in tables. Significant p value was considered at $p < 0.05$.

RESULTS

Socio-demographic characteristics of study participants

Of the participants, (97.5%) were unmarried and (24.4%) were orphaned A total of 66 (55.5%) participants were females. Mean age ± SD of study participants was 14.1 ± 3.1 years **Table 1.**

Table 1: Socio-demographic characteristics of study participants

Demographic variables	Frequencies n (%)
Age group (years)	
10 – 14	72 (60.5)
15 – 19	47 (39.5)
Sex	
Male	53 (44.5)
Female	66 (55.5)
Currently in school?	
Yes	104 (87.4)
No	15 (12.6)
Educational status of the participants	
Primary	53 (44.5)
Secondary	59 (49.6)
Tertiary	7 (5.9)
Marital status	
Single	116 (97.5)
Married	3 (2.5)
Parents alive?	
Yes	90 (75.6)
Mean ± SD (years): 14.1 ± 3.1	

Participant's parents HIV status and care-givers characteristics

The HIV status of deceased parents of participant's was not known in 67.2%. The care-givers in this study were found to be females in 75.6% cases with the grand-parents accounting for 13.5% **Table 2**.

Table 2: Participant's parents HIV status and care-givers characteristics

Variables	**Frequencies n (%)**
Parents HIV status	
Negative	21(17.7)
Positive	18(15.1)
Not known	80 (67.2)
Care-givers relationship	
Siblings	7 (5.9)
Parents	85(71.4)
Aunties / Uncles	11(9.2)
Grand parents	16(13.5)
Care-givers sex	
Male	29 (24 .4)
Female	90 (75.6)
Care-givers education	
No formal	18 (15.1)
education Primary	49 (41 .2)
Secondary	20 (16.8)
Tertiary	32 (26.9)
Care-givers occupation	
Unemployed	28 (23.5)
Business	51 (42.9)
Farmer	21 (17.6)
Civil Servants	19 (16.0)

Disclosure status, Care-givers HIV status and opinion on HAART

The mean ± SD (17 .0 ± 4.8) years of HIV disclosure was found while the perceived safest age (by the care-givers) for HIV status disclosure was 11.0 – 15.0 years with a total of 69 (58.0%) having disclosed their HIV status. Disclosure was by the mother in 37 .7% cases. The commonest reason for delayed disclosure was perceived immaturity of the children **Table 3**.

Table 3: Disclosure status, Care-givers HIV status and opinion on HAART

Variables	Frequencies n (%)
HIV disclosure	
Yes	69 (58.0)
No	50 (42.0)
Disclosure was by?	
Father	11 (15.9)
Mother	26 (37.7)
Healthcare worker	21 (30.4)
Grand parents	06 (8.8)
Siblings	03 (4.3)
Aunties / Uncles	02 (2.9)
How long ago was the disclosure?	
Few years ago	29 (42.0)
A year ago	19 (27.6)
Less than a year	21 (30.4)
Immediate reaction after disclosure	
Nothing	26 (37.7)
Felt sad and angry	34 (49.3)
Felt calm	09 (13.0)
Reasons for delaying disclosure	
Adjudged immature	63 (91.3)
Worried	06 (8.7)
How many people has the child disclosed to?	
1	10 (32.3)
2	07 (22.6)
3	09 (29.0)
≥ 4	05 (16.1)
Care-givers perceived safest age for dis closure	
6 – 10	33 (27.7)
11 – 15	54 (45.4)
16 – 20	32 (26.9)
Care-givers also on ART	
Yes	72 (60.5)
No	47 (39.5)
Other siblings on ART	
Yes	23 (19.3)
No	96 (80.7)

The mean ± SD (years) HIV disclosure: 17.0 ± 4.8 years

Antiretroviral treatment and viral load characteristics

Forty two percent of participants in this study have being on ART for 6 – 10 years. Good adherence to ART was found in 79% with resultant viral suppression in 84% of the cases. Of those virally suppressed, 4.2% had low level viraemia. A total of 90.8% were on first line with 79.8% on Tenofovir, Lamivudine and Dolutegravir (TLD); none on third line **Table 4.**

Table 4: Antiretroviral treatment and viral load characteristics

Variables	**Frequencies n (%)**
Duration on ART	
Since birth	13 (10.9)
1 – 5 years	46 (38.7)
6 – 10 years	51 (42.9)
11 – 15 years	09 (7.5)
Regimen line	
1st line	108 (90.8)
2nd line	11 (9.2)
3rd line	0 (0.0)
Regimen child is on	
TDF/3TC/DTG	95 (79.8)
ABC/3TC/LPV/r	10 (8.4)
AZT/3TC/NVP	02 (1.7)
AZT/3TC/LPV/r	02 (1.7)
TDF/3TC/ATV/r	01 (0.8)
ABC/3TC/DTG	09 (7.6)
Child adherent status	
Good	94 (79.0)
Fair	13 (10.9)
Poor	12 (10.1)
Is child virally suppressed?	
Yes	100 (84.0)
No	19 (16.0)
Latest viral load	
< 20	95 (79.8)
20 – 999	05 (4.2)
≥ 1000	19 (16.0)

Determinants of viral suppression among adolescents living with HIV

Adolescents with good adherence to HAART have four-fold odds of being virally suppressed (OR: 4.2; 95% CI: 1.1 – 3.6). However, child's age (OR: 1.2; 95% CI: 0.1 – 10.7), sex of the child (OR: 1.1; 95% CI: 0.4 – 2.9), parents HIV status (OR: 0.8; 95% CI: 0.2 – 3.4) and parents being alive (OR: 0.7; 95% CI : 0.2 – 2.9) were not so significant **Table 5**.

Table 5: Determinants of viral suppression among adolescents living with HIV

Virally suppressed	**Odds ratio**	**95 % CI**	**p-value**
Child's age			
10 – 14	1.154	0.13-10.65	0.900
15 – 19	Ref		
Parent's alive			
Yes	0.723	0.18-2.89	0.647
No	Ref		
Parent's HIV status			
Positive	0.808	0.20-3.35	0.769
Negative	Ref		
Sex			
Male	1.126	0.44-2.91	
Female	Ref		
Disclosed HIV status	0.648	0.25-1.69	0.375
Good ART Adherence	4.237	1.13 – 3.59	0.021

DISCUSSION

Our study described the pattern of disclosure among adolescents living with HIV, viral load suppression and factors affecting it. Majority of the participants were in the lower half of the age spectrum, were single, were females and with age at disclosure found to be at the upper end of the age spectrum. Although, the age of disclosure was sub-optimal, a direct relationship was established between a good adherence and being virally suppressed. These findings are similar to other studies.[1, 8]

About a quarter of the participants in this study were orphaned. This is lower than the 50% orphan reported by Arun *et al*[15]. The difference may be due to the case definition for orphan in this study which looks at the demise of both parents. Other possible reasons are age difference of the parents of the participants, varying adherence to HAART and existence of co-morbidities. A smaller sample size used in the latter study compared to the present study might also explain the difference.

The mean age of HIV disclosure to the adolescents in this study was 17 years while the perceived safest age range for disclosure of HIV status by the care-givers was 11 – 15 years. This is similar to the finding by Vreeman *et al*[8] that reported variation in disclosure by age as younger age group individuals are generally considered too immature for such information dissemination.

Similarly, Eneh *et al*[14] in Enugu reported age 13 – 14 years as the commonest age of HIV status disclosure in their study. The explanation given for the delayed disclosure was the perceived immaturity of this group of individuals, comparable to ours.

Prevalence of HIV status disclosure was 58.0% in this study. Despite the sub-optimal disclosure of HIV status in our study, it was far much higher than that reported in other elsewhere. For instance, Arun *et al*[15] reported 6% in India. Even though, the two settings were completely different, it is by far lower than our findings. Vreeman *et al*[8] in Kenya and Abegaz *et al*[13] in North Western Ethiopia reported 26.0% and 44.o% respectively. Even though they reported higher disclosure rates than that in India, it is still quite low compared to our study finding. Possible reasons for these variations include the difference in the mean age of the study participants, differences in the care-givers perceived age of disclosure largely influenced by cultural differences and differences in the support services available for the adolescents. The disclosure was by the mother in over a third of the participants. This is not surprising as adolescents are generally closer to their mothers who is directly involved in their day to day feeding, chores and other household activities than the father. More than half of the participants that knew their HIV status did not relate it to anyone because of the fear of being stigmatized.

This is in contrary to the care-givers perception of the participants as being immature, as they were old enough to know that such information needs to be well guided.

Our study revealed comparable viral suppression rate similar to that reported in nearby Borno State, North-Eastern Nigeria where 84.0% rate was reported just like the current study.

Both studies share similar denominator as they are Hospital based studies. In contrast, Ssemwanga *et al*[17] reported 95% in a National survey in Uganda. Difference in the finding may be largely due to the fact that the Ugandan study was population based where the participants are apparently normal with some newly infected compared to this study which is Hospital based.

Children are known to have poor viral suppression as they depend on their care-givers efficiency with the odds of virologic failure increasing with decreasing age. Moreover, most participants in the present study were on first line regimen, with most of them on Tenofovir / Lamivudine / Dolutegravir (TLD) regimen. Majority have good ART adherence status and three-quarter of these study participants are virally suppressed with a direct relationship established between having good adherence to ART and being virally suppressed. Adolescents having good adherence to HAART is a significant determinant of being virally suppressed. This is similar to the findings from other studies.[12, 17]

In conclusion, the mean age of HIV disclosure among the adolescents in this study was in the second decade of life. There is a high prevalence of HIV status disclosure in this study. While most of the study participants have good adherence to ART and have good viral load suppression, having good adherence to HAART is a significant factor associated with being virally suppressed.

DECLARATIONS

Acknowledgment: Nurse Sunday Kure of the Youth and Adolescents Centre Lafia is acknowledged. All the adolescents living with HIV and their care-givers are appreciated for their participation in this study.

Conflict of interest: None.

Funding: No funding to declare

Authors contributions: BSO; Conceptualisation, literature review, data collection, analysis and interpretation, manuscript writing, approval of final version. **AES**; Conceptualisation, data analysis and interpretation, manuscript writing, approval of final version. **HII;** Literature review, data analysis and interpretation, manuscript writing, approval of final version. **OTO**; Literature review, data collection and interpretation, manuscript writing, approval of final version. **AMC**; Data collection, analysis and interpretation, manuscript writing, approval of final version. **OCE;** Data collection, analysis and interpretation, manuscript writing, approval of final version. **IYO**; Data collection, analysis and interpretation, manuscript writing, approval of final version. **ITL;** Data analysis and interpretation, manuscript writing, approval of final version **LAA:** Data collection, analysis and interpretation, manuscript writing, approval of final version **AA**; Data analysis and interpretation, manuscript writing, approval of final version **DM**; Literature review, data analysis and interpretation, manuscript writing, approval of final version.

REFERENCES

1. Yiltok ES, Yuwa V, Mshelia A, et al. Challenges of the care of HIV positive adolescents in Jos, Nigeria. Journal of AIDS and HIV Research. 2019; 11 (6): 59 – 67.
2. Koye DN, Zeleke BM. Mother-to-child transmission of HIV and its predictors among HIV-exposed infants at a PMTCT clinic in northwest, Ethiopia. BMC Public Health. 2013; 13: 398 – 403.
3. Kaushik A, Pineda C, Kest H. Sexual behavior and knowledge among adolescents with perinatally acquired Human Immunodeficiency Virus infection compared with HIV – uninfected adolescents at an urban tertiary centre in New Jersey. International Journal of Reproductive Medicine. 2016; 7: 1 – 5.
4. Usman AB, Asekun-Olarinmoye E. Human Immunodeficiency Virus infection among exposed infants in selected primary health care facilities in Nigeria: a retrospective cohort study. Ethiopia Journal of Health Sciences. 2020; 30 (4): 479 – 88.
5. Bello SO, Audu ES, Odiachi H. The impact of anti-retroviral treatment on the prevention of mother to child transmission of HIV among children seen at the Dalhatu Araf Specialist Hospital Lafia North- Central Nigeria. Journal of Dental and Medical Sciences. 2018; 17 (5): 53 – 56.
6. Imade PE, Uwakwe NO, Omoregie R, Eghafona NO. Effect of the prevention of the mother to child transmission program on the prevalence of postnatal HIV infection in Benin City, Nigeria. Fooyin Journal of Health Sciences. 2010; 2: 58 – 61.
7. Ngonzi J, Mugyenyi G, Kivunike M, et al. Frequency of HIV status disclosure, associated factors and outcomes among HIV positive pregnant women at Mbarara regional reference Hospital, southwestern Uganda. Pan African Medical Journal. 2019; 32: 200 – 10.
8. Vreeman RC, Scanlon ML, Mwangi A, et al. A cross-sectional study of disclosure of HIV status to children and adolescents in western Kenya. PLoS ONE. 2014; 9 (1):e86616 – e86625.
9. Naigino R, Makumbi F, Mukose A, et al. HIV status disclosure and associated outcomes among pregnant women enrolled in antiretroviral therapy in Uganda: a mixed methods study. Bio Med Central Reproductive Health. 2017; 14: 107 – 16.
10. Wilfert CM, Fleischman AR, Mofenson LM, et al. Disclosure of illness status to children and adolescents with HIV infection. American Academy of Paediatrics, committee on Pediatrics AIDS. 2021; 103 (1): 164 – 8.

11. Sunkanmi F, Paul Y, Peter D, et al. Factors influencing viral load non-suppression among people living with HIV (PLHIV) in Borno State Nigeria: A case of Umaru Shehu Ultra-Modern Hospital. Journal of Advances in Medicine and Medical Research. 2020; 32 (3): 98 – 105.
12. Nasuuna E, Kigozi J, Babirye L, Muganzi A, Sewankambo NK, Nakanjako D. Low HIV viral suppression rates following the Intensive Adherence Counseling (IAC) program for children and adolescents with viral failure in Public Health facilities in Uganda. BMC Public Health. 2018; 18: 1048 – 56.
13. Abegaz BF, Walle TA, Tilahun AD. HIV positive status disclosure among HIV infected children in Pediatric ART clinc in Gondar town public health facilities, North West Ethiopia. Journal of Infection and Public Health. 2019; 12:873 – 877.
14. Eneh AU, Ugwu RO, Paul NI. HIV disclosure in children in a tertiary Hospital in Southern Nigeria – child's perspective. Asian Journal of Medicine and Health. 2020; 18 (1): 16 – 27.
15. Arun S, Singh AK, Lodha R, Kabra SK. Disclosure of the HIV infection Status in Children. Indian Journal of Pediatrics. 2009; 76 (8): 805 – 8.
16. American Academy of Pediatrics, Committee on Pediatric AIDS. Disclosure of Illness Status to Children and Adolescents with HIV Infection. Pediatrics. 2021; 103 (1): 164 – 8.
17. Ssemwanga D, Asio J, Watera C, et al. Prevalence of viral load suppression, predictors of virological failure and pattern of HIV drug resistance after 12 and 48 months on first - line antiretroviral therapy: a National cross-sectional survey in Uganda. Journal of Antimicrobial Chemotherapy. 2020; 75: 1280 – 9.

How to cite this article : Bello SO, Audu ES, Hassan II, et al. Human Immunodeficiency Virus Disclosure and Viral Load Suppression Statuses of Adolescents Living with HIV : A Cross -sectional Study in Lafia , Nigeria . J Nig Infect Dis 2023; 2(1):27-35.