

Adherence to Anti-Retroviral Prophylaxis in HIV Exposed Infants Attending Clinic in a Tertiary Hospital in North-West Nigeria

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ABSTRACT

Background: Anti-retroviral (ARV) drugs are the mainstay for treatment of human immunodeficiency virus (HIV) infection as well as prevention of HIV spread from infected mothers to their uninfected children otherwise known as HIV exposed infants. The aim of the study was to assess adherence to anti-retroviral prophylaxis in HIV exposed infants attending clinic in a tertiary hospital in north-west Nigeria. **Methodology:** A descriptive cross-sectional study design was used to assess adherence to ARV prophylaxis among 85 HIV exposed infants receiving care at a tertiary hospital in north-west Nigeria. The infants were selected through systematic random sampling technique, and an interviewer-administered structured questionnaire was used to collect data. The data was analysed using computer software, IBM SPSS version 23. Results obtained were presented in frequency tables and charts. **Results:** Up to 43 (50.6%) of the infants were between 6-12 months old. There were 49 (57.6%) male infants. Seventy-two (84.7%) of the infants were enrolled at birth. Most, 72 (84.7%) of the infants received ARV prophylaxis at birth. Majority, 64 (75.3%) of the infants were on ARV prophylaxis for a duration of six weeks, and 18 (21.2%) were on the ARV prophylaxis for up to 12 weeks. Majority, 73 (85.9%) of the HIV exposed infants never missed a single ARV dose. In 9 infants, (75.1%) who missed ARV dose(s), their caregivers forgot to give them the drugs. **Conclusion:** Adherence to ARV prophylaxis among the HIV exposed infants was suboptimal. Forgetfulness of the caregivers was the main reason for non-adherence to ARV prophylaxis among the HIV exposed infants in the study site. Caregivers should be taught and encouraged to use alarm reminders to improve adherence to ARV prophylaxis.

Keywords: Anti-retroviral, adherence, infants, clinic.

INTRODUCTION

Children under 15 years of age are commonly infected with human immunodeficiency virus (HIV) mainly through mother to child transmission

(MTCT) otherwise known as vertical transmission. According to WHO 2018 report, about 1.7 million children were living with HIV and 160,000 were

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newly infected.^{[1],[2]} Meanwhile over 90% of the infection was through MTCT. It is even worse in sub-Saharan Africa majorly due to the endearing need for breastfeeding. One in five children born to HIV positive mother in West Africa becomes positive during childbirth or breastfeeding.^{[3],[4],[5]} Although, the 2018 report by Nigerian HIV/AIDS Indicator and Impact Survey (NAIIS) shows that the prevalence among children 0-14years in Nigeria is 0.2%.^[6]

ARV drugs are the mainstay for treatment of HIV infection as well as prevention of HIV spread from infected mothers to their uninfected children otherwise known as HIV exposed infants. In low-income countries, especially Africa it is paramount to start all children born to HIV infected mothers on anti-retroviral (ARV) drug prophylaxis and extend the medication course to cover the entire breastfeeding period; usually 12months to enable the infected mothers to breastfeed their infants with substantially reduced risk of HIV transmission. Zidovudine and Nevirapine short course have shown to profoundly and cost effectively reduce the transmission of HIV in infants. The risk of MTCT is about 15-45% without any intervention. However, with the effective use of ARV the rate is reduced to less than 5% among the breastfeeding group while the rate is reduced to less than 2% among the non-breastfeeding group.^{[7],[8],[9]}

With breastfeeding being integral in preventing problems of malnutrition, diarrheal diseases and respiratory tract infections which are far more often fatal than the HIV itself in that age group in low-income areas. The need for such mode of feeding as well as adherence and compliance to ARV prophylaxis cannot be overemphasized. This is supported by the Joint United Nations Program on HIV and AIDS (UNAIDS) initiative called "Global plans towards the elimination of new HIV infections among children by 2015 and keeping their mothers' alive".^[3] The single most important factor for vertical transmission is maternal viral load, adherence of the mother to her ARVs during

pregnancy and throughout breastfeeding is of paramount importance. This will also translate to good adherence for the infant after delivery. Of importance to this note is adherence and compliance to taking the anti-retroviral drugs; multiple times a day as the case may be, for as long as 6 weeks to up to 12 months. This is extremely challenging for the HIV exposed infants as well as their caregivers. ARVs are given to HIV exposed infants for the first 6 weeks of life in infants on replacement feeding (Nevirapine only), and first 12 weeks of life in infants on breastfeeding (Nevirapine and Zidovudine).^[10] Subsequently, Septrin for prophylaxis against opportunistic infection is given should in case there's seroconversion at any point in time since the child is still exposed to the virus via continued breastfeeding.

ARV uptake adherence and follow up compliance among some caregivers of HIV exposed infants is currently not satisfactory especially in our society, Nigeria. Majority of the infants are lost to follow up before the final infection status is determined.^[7] Poor adherence with the anti-retroviral therapy (ART) in our society is said to be common and multi-factorial. It is majorly associated with the mothers' ignorance, negligence and paucity of information.

On the other hand, non-availability of the drugs, attitude and miscommunication by the healthcare providers may be contributory factors, as well as bad taste and adverse effects of the drugs. Other factors identified as serious obstacles to ART adherence were financial constraints such as transportation cost from residences to the clinics, long waiting time at the clinic, language barrier, physical constraints to attending clinics due to health status of the mother, change of address, lack of father's involvement, social factor like fear of HIV-related stigma by the mother and non-disclosure of HIV status of the mother to the father or the immediate family.^[11]

METHODOLOGY

The study was carried out at Ahmadu Bello University Teaching Hospital (ABUTH), The Presidential Emergency Plan for AIDS Relief (PEPFAR) clinic, also known as the Nasara clinic and treatment centre is the focal unit for this study. The clinic runs on week days, with a twice weekly paediatric clinic. A range of services, comprehensive facility and home-based care, all free, are provided. The different cadres of staff involved include doctors, nurses, counsellors, pharmacist, laboratory technicians, clinic attendants, and the administrative staff.

A descriptive cross sectional study design was used to assess adherence to ARV prophylaxis among HIV exposed infants receiving care at Nasara clinic ABUTH Shika. Sample size of 85 HIV exposed infants was used which were selected through systematic sampling technique. The HIV exposed infants that fulfilled the eligibility criteria within the period of the study were recruited into the study. Questionnaires were administered weekly throughout the study period.

The data was collected using a pre-tested interviewer administered structured questionnaire with open and close-ended questions arranged in three sections. The data collection was carried out with the help of research assistants who were trained on the objective of this study and the administration of the data collection tool. The data was cleaned and analysed using Statistical Package for the Social Sciences (IBM SPSS) software version 23.0, and results presented in tables and charts.

An ethical clearance was obtained from Health Research Ethics Committee (HREC) of Ahmadu Bello University Teaching Hospital, Shika. Permission was sought from the coordinator of Nasara clinic, ABUTH Shika. An informed consent was also obtained from respondents, and confidentiality was assured.

RESULTS

Up to 43 (50.6%) of the infants were between 6-12 months old. There were 49 (57.6%) male infants. Seventy-two (84.7%) of the infants were enrolled at birth. Most, 72 (84.7%) of the infants received ARV prophylaxis at birth. Majority, 84 (98.8%) of the infants were exclusively breastfed. Fifty-one (60.0%) of the infants had negative PCR/DNA test result. (Table 1) Majority, 64 (75.3%) of the infants were on ARV prophylaxis for a duration of six weeks, and 18 (21.2%) were on the ARV prophylaxis for up to 12 weeks. (Figure 1) Up to 12 (14.1%) of the HIV exposed infants missed at least a single ARV dose. In 9 infants, (75.1%) who missed ARV dose(s), their caregivers forgot to give them the drugs. Drugs got finished in 1 (8.3%), drugs make the baby sick 1 (8.3%), and the timing for giving the ARV was not convenient in 1 (8.3%) respondent. (Table 2) More than half, 55 (64.7%) of the infant/caregiver live within 6 - 10 kilometres to the healthcare facility, and only 1 (1.2%) infant/caregiver live more than 16 kilometres away from the healthcare facility. Most, 55 (64.7%) of the infant/caregiver never had any transportation difficulties while coming to the healthcare facility. More than half, 55 (55.3%) of the infant/caregiver had long waiting time at the clinic during follow up sometimes. Majority, 84 (98.8%) of the infants/caregiver never experienced stigmatization by the healthcare workers. Majority, 70 (82.4%) of the infants/caregivers never missed clinic visit due to financial difficulties. (Table 3).

Table 1: Socio-demographic characteristics of the infants, March 2021. (n = 85)

Variable	Frequency	Percent (%)
Age (months)		
<6	21	24.7
6–12	43	50.6
>12	21	24.7
Mean age = 9.1 ± 5.1		
Sex		
Male	49	57.6
Female	36	42.4
Age at enrolment		
At birth	72	84.7
≤6 weeks	13	15.3
>6 weeks	-	-
Received ARV prophylaxis		
Yes	72	84.7
No	13	15.3
Feeding practice		
Exclusive breastfeeding	84	98.8
Replacement feeding	1	1.2
Mixed feeding	-	-
Infant PCR/DNA HIV test result		
Negative	51	60.0
Positive	-	-
Unknown	34	40.0

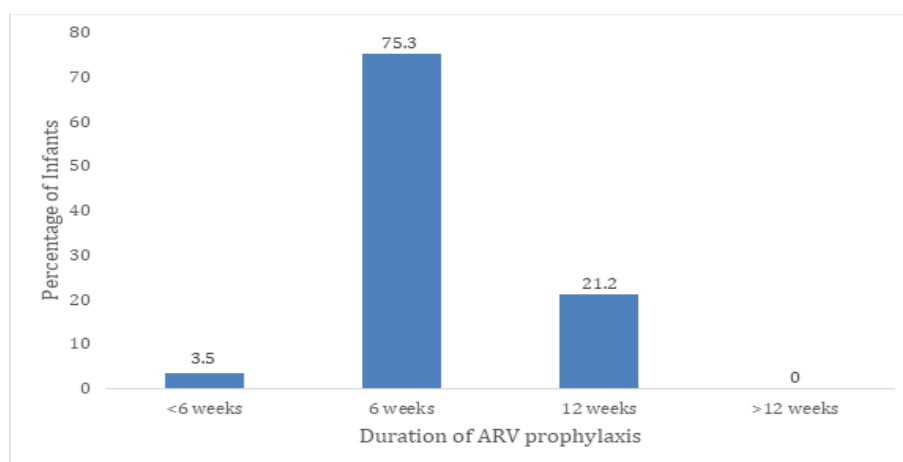


Figure 1: The duration of which infant has been on ARV prophylaxis, March 2021.

Table 2: Reasons for missing ARV doses in the infants, March 2021. (n = 12)

Reasons for missing ARV doses	Frequency	Percent (%)
I forgot to give baby the drugs	9	75.1
Drugs got finished	1	8.3
The drugs make baby sick	1	8.3
Timing for giving the ARV was inconvenient	1	8.3
Total	12	100

Table 3: Factors that affect clinic attendance by infant/caregivers in ABUTH Shika, March 2021.

Variable	Frequency	Percent (%)
Distance of health facility (Km)		
≤5	10	11.8
6 – 10	55	64.7
11 – 15	19	22.3
≥16	1	1.2
Transportation difficulties to the facility		
Never	55	64.7
Some times	28	32.9
Most times	2	2.4
Long waiting time at the clinic during follow up		
Never	34	40.0
Some times	47	55.3
Most times	3	3.5
All times	1	1.2
Experienced stigmatization		
Yes	1	1.2
No	84	98.8
Missed clinic due to financial difficulties		
Some times	15	17.6
Never	70	82.4

DISCUSSION

This study assessed the adherence to ARV prophylaxis among HIV exposed infants. The administration of antiretroviral agents to the infant should be initiated as soon as possible after birth and certainly within 6 to 12 hours after delivery. Findings from non-human studies indicate that prophylaxis is less effective when delayed, therefore HIV infection is less likely to be prevented.^[12,13,14] More than half of the infants were between 6-12 months old and majority of them, up to 84.7%, were enrolled at birth and had received ARV prophylaxis at birth. This enrolment level is high and similar to findings from Ethiopia (91%) and Uganda (84.8%).^[7,15] However, a study conducted in Zimbabwe another African country found 31% which is such a low uptake of ARV prophylaxis.^[16] It is quite possible that the higher uptake of ARV prophylaxis found among this HIV exposed infants might be that this study site has an integrated and comprehensive care program. It is also possible that mothers of these infants are more aware of the importance of the ARV prophylactic intervention that they are receiving. Mothers living with human immunodeficiency virus (HIV) should be guided to provide appropriate infant feeding to their infants. Infant

feeding in the context of HIV is complex because of the major influence that feeding practices exerts on child survival. Non-breastfed infants, especially those from low resource areas face higher risks of death from causes other than HIV, in particular malnutrition and diarrhoea among non-breastfed. Thus, due to this and the fact that these are places where replacement feeding is neither readily available nor safe, women with HIV infection who choose to breastfeed after appropriate counselling are educated to adhere to treatment for themselves and their infants. Studies have revealed that maternal or infant ARV drug administration during lactation reduces the risk of HIV transmission to the infant via human milk.^[17,18] In this study, almost all the infants were exclusively breastfed. This is similar to the finding in a study carried out by Shargie et al in Ethiopia which showed that infants feeding practice was significantly exclusive breastfeeding and was associated with adherence and compliance to ARV prophylaxis.^[7] Similarly, a study from Abakaliki, Nigeria found 91.7% EBF with ARV prophylaxis among HIV exposed infants,^[19] this indicates adherence to WHO recommendation and shows a gain towards achieving HIV-free infant survival in the African

sub-region.^[20,21] The finding that most children in the study were breastfed is not surprising since in African societies, breastfeeding is almost universal. Also, mothers may feel not breastfeeding could disclose their HIV status to family and friends. It is thus imperative for the health providers to then be culturally sensitive and non-judgmental to encourage adherence and appropriate follow up to treatment.^[22] Up to 60.0% of the infants had negative PCR/DNA test result. Only 60.0% of the caregivers knew the results of their infants, as some results don't come back early and some caregivers don't even bother especially those not literate enough. It is discouraging that such a large proportion of mothers do not know the results of their HIV exposed infants as there could be some amongst them with a positive HIV status. A non-population based study in Nigeria revealed relatively low values of early (2.7%) and final (2.8%) MTCT rates compared to national estimates of 15% and 10% respectively. These early and late PCR/DNA tests were done when infants were six months old or less and 18 months old or more.^[23,24] Infants who initially tested negative may later become HIV-infected especially in prolonged breastfeeding or mixed feeding, while those that probably had a false positive early test may ultimately be found HIV-negative.^[25,26] Provision of antiretroviral prophylaxis to the infant exposed to HIV for 4 to 6 weeks is one of cost-saving strategies to reduce perinatal transmission of HIV.^[27] In this study, majority of the infants were on ARV prophylaxis for a duration of six weeks, and only 21.2% were on the ARV prophylaxis for up to 12 weeks. In contrast, another study reported 100% percent of infants received ARV prophylaxis for 6 weeks showing optimal adherence.^[19]

It is very important that the HIV exposed infants adhere to the ARV prophylaxis as this helps to reduce HIV transmission. Majority of the HIV exposed infants never missed a single ARV dose. This is similar to a study carried out by Larsen et al in South Africa on longitudinal adherence to maternal antiretroviral therapy and infant Nevirapine prophylaxis from 6weeks to 18months

postpartum amongst a cohort of mothers and infants which observed cumulative ARV adherence among HIV exposed infants at 6weeks to be 75%.^[28] Similarly, study done by Mazanderani et al in South Africa on non-nucleoside reverse transcriptase inhibitor levels among HIV exposed un-infected infants at the time of HIV PCR testing-findings from a tertiary healthcare facility in Pretoria indicated 70.0% adherence at 6 weeks.^[29]

Women participating in programmes for the prevention of mother-to-child transmission of HIV face several challenges that may compromise the care they provide for the HIV exposed infant by negatively affecting adherence to treatment. The need to give ARVs to the infant as medically prescribed may be a huge challenge on the one hand, and on the other hand, shortages of charge-free infant ARVs may affect adherence to treatment.^[30] In this study, among the 14.1% of infants who missed at least a dose of the ARV; most were as a result of the either caregivers forgetting to give them the drugs, drug was exhausted, drugs side effect was observed, or the timing for giving the ARV was not convenient. This is consistent with a study carried out by Mothi et al on paediatric HIV trends and challenges which recognized negligence by the caregiver and side effects of ARV, among others as factors that affect adherence and compliance to ARV prophylaxis in HIV exposed infants.^[31] Another study carried out by Baryamutuma et al in Uganda on an early assessment of Uganda's rollout of option B+: Service capacity and infant outcomes which indicates ARV stock out, among others as a factor affecting adherence and compliance to ARV among HIV exposed infants.^[32]

The findings of studies from Nigeria and Ethiopia show that transmission of HIV infection is more likely to occur among HIV exposed infants whose mothers reside in rural areas, this is so because they have a reduced access to enlightenment campaigns and adherence counselling. Other lacks that they may face include a poor transport and communication systems, poorly trained staff, as

well as drug stock outs.^[24,33,34] This study found that more than half of the infant/caregivers live within 6 – 10 kilometres to the healthcare facility, and only 1.2% infant/caregivers live more than 16 kilometres away from the healthcare facility. Also, most of the infant/caregivers never had any transportation difficulties while coming to the healthcare facility.

Some of the challenges experienced by women caring for an infant who is HIV exposed may be socio-cultural. Others are in form of religious practices or even stigma which could deter some women from continuing with infant prophylaxis. Other challenges are with the healthcare system such as time-consuming appointments and protracted waiting periods. Clinic organisation was often inefficient and complicated by stock-outs of essential medication, and at times, it is the healthcare workers that stigmatise mothers and their infants.^[30] The findings in this study reveal more than half of the infant/caregivers complained of long waiting time at the clinic during follow up sometimes. Almost all the infants/caregiver never experienced stigmatization from the healthcare workers. Majority of the infants/caregivers never missed clinic visit due to financial difficulties. This is similar to the findings from a study done by Yah and Tambo which reviewed articles and reports published online on why is mother to child transmission of HIV a continual threat to newborns in sub-Saharan Africa which recognized financial needs for transport from residence to the healthcare facility, long waiting time, stigmatization by the healthcare workers as challenges that affect adherence and compliance to ARV prophylaxis in HIV exposed infants.^[11] Another study conducted in western Uganda by Decker et al assessed adherence to option B+ until 18 months postpartum showed that drug adherence was associated with lower travel cost.^[35]

Conclusion and Recommendation

Adherence to ARV prophylaxis among the HIV exposed infants was suboptimal. Forgetfulness of the caregivers was the main reason for non-

adherence to ARV prophylaxis among the HIV exposed infants in the study site. Strategies can be introduced to reduce waiting time by clients such as encouraging on time visits on appointed days as well as early commencement of service provision. The healthcare workers in the clinic should enhance health education and counselling for caregivers especially on adherence to ARV prophylaxis to reduce the effect of non-adherence due to forgetfulness or negligence. Caregivers should be taught and encouraged to use alarm reminders to improve adherence to ARV prophylaxis. Other options may be to administer the ARV drugs to infant preferably same time every day and at same time the mother is taking her own treatment.

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