

Overcoming the Challenges in Viral Load Sample Coverage and Suppression in HIV-Positive Pediatrics and Adolescents on Antiretroviral Therapy in Enugu, South-East Nigeria: The Lessons from Implementing Weekend Viremia Clinic Services

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Abstract:-

Background: Conflicting school hours pose a significant challenge to viral load sample collection coverage for HIV-positive school-age children in Nigeria. This paper highlights the merits of the weekend viremia clinic services in improving viral load coverage and suppression among HIV-positive school-aged children with missed opportunities as a result of conflicting school hours.

Methods: The weekend viremia clinic service was implemented from February 2020 to October 2022. We listed the HIV-positive school-age patients who were eligible for viral load tests from the electronic medical records and batched them according to their local government area of residence. Ethical approval for patients' home visits was obtained from the State Ministry of Health. The patients were assigned to the Orphan and Vulnerable Children case managers who facilitated the mobilization of the test-eligible HIV-positive children to ART centers on Saturdays for viral load sample collection. The consent of the caregivers was obtained via phone calls prior to the home visits.

Results: The viral load coverage for HIV-positive pediatrics and adolescents increased from 79% to 89% while the viral suppression rate increased from 56% to 95% during the three-year period. Nine-nine percent of the caregivers were satisfied with the quality of services they received during the weekend viremia clinic visits.

Conclusion: Facilitated child-convenient clinic visits are critical in achieving optimal viral load outcomes in pediatrics and adolescents with missed opportunities for viral load testing.

Keywords:- *Conflicting; School Hours; Weekend; Viral Load; Coverage; Suppression; Facilitated, Child-Convenient.*

I. INTRODUCTION

Nigeria is ranked 4th country in the global HIV burden with 1.9 million infected persons and a current HIV prevalence of 1.4%.¹ About 170,000 children under 14 years are on antiretroviral therapy (ART) services¹. In Nigeria, over 95% of ART centers are government-owned facilities that open for services during school hours². The complexity of HIV transmission varies across Nigeria. Transmission of HIV is determined by factors such as prostitution, cultural beliefs against available preventive measures, poorly treated sexually-transmitted diseases, unprotected sexual activities in men-having-sex-with-men (MSM), and indiscriminate exposure to infected body fluids³.

Sustained continuity of care above 95% in Children Living with HIV (CLHIV) is critical for maximal suppression of viral load⁴. In Nigeria, a 95% continuity of treatment is achieved through the home and proxy ART refills, a differentiated service delivery (DSD) model whereby caregivers pick up ARVs for HIV-positive children⁵. However, viral load services are largely facility-based and samples are collected especially when patients visit the ART centers. A major drawback of the ART program in Nigeria is that HIV-positive pediatrics and adolescents are grossly under-served with viral load services due to conflicting school hours. The ART centers may wait for school holidays to collect viral load samples from eligible HIV-positive school pediatrics and adolescents. Some ART centers capitalize on ART social structures such as Operation Triple Zero (OTZ) parties to collect viral load samples from CLHIV. However, OTZ is approved only for patients between 10-24 years, thus it leaves out the critical age group such as 0-9 years. The OTZ structures are available in only 13 out of 37 ART centers due to a funding gap. The viral load sample management and processing are critical in ensuring accurate results in large community viral load services. According to research, there was a statistically significant difference in viral load copies in equal volumes of samples that were analyzed after six and twenty-four hours⁶. The use of Dried Blood Spots (DBS) for viral load testing has

been piloted in several places. In Malawi, the use of DBS to collect blood samples for viral load testing reduced the cost of viral load services by 30%⁷.

It was often the case that some children who are eligible for viral load assay missed the opportunity to check their viral load due to a lack of transport fare to the ART centers⁸. Enugu State Ministry of Health has trialed large-scale Community Viral Sample Collection (CVSC) during evening hours aimed at improving viral load coverage and suppression in CLHIV but this was discontinued after three months due to viral load sample mismanagement. Even with the strategies implemented by the state Ministry of Health, the viral load coverage and suppression for CLHIV at the end of the program fiscal year 2019 were 79% and 56% respectively (Figure 1).

These were the findings prior to the implementation of weekend viremia clinic services in February 2020 in Enugu. Thus, the use of child-friendly viral load services is pivotal to achieving optimal viral load coverage and suppression among CLHIV in the state. We present below our experience and lessons learned implementing Orphan and Vulnerable Children (OVC)-supported weekend viremia clinic services for CLHIV in Enugu state, south-east Nigeria.

In partnership with Caritas Nigeria, the Enugu State AID/STI Control Program (SASCP) implemented a five-year Global Action Towards HIV Epidemic Control in Subnational Units (4GATES) in Enugu state, southeast Nigeria from October 2017 to September 2022. During the 4GATES project, the ESMOH expanded HIV testing services through the facility and community approaches in other to cover the huge treatment gap. During this period, over 52,646 new clients were commenced on antiretroviral treatment of which 2,067 were children and adolescents¹⁰.

To address the gap in viral load coverage and suppression among HIV-positive pediatrics and adolescents, the state ministry of health in collaboration with Caritas Nigeria commenced weekend (Saturday) viremia clinic services in February 2020. This was aimed at providing ART services for HIV-positive school children with missed opportunities for viral load testing due to conflicting school hours¹¹. The Orphan and Vulnerable Children Services, a PEPFAR-funded program for the mitigation of the burden of HIV among CLHIV, was crucial in the implementation of the intervention.

II. METHODS

This was a community-based viral load intervention implemented from February 2020 to September 2022. Enugu state is one of the states with a high burden of HIV in Nigeria with an HIV prevalence of 2.1% which is higher than the national prevalence⁸. The Enugu State AIDs/STI Control Program (ESACP) provides oversight of the ART centers and ensures the adoption of the National Guidelines on HIV Prevention, Treatment, and Care in the state. There were 37 ART centers in the state that provided ART services to 3,430 HIV-positive children and adolescents under 20 years. The

eligibility list of children and adolescents for viral load testing was generated from the National Data Repository (NDR) and crosschecked with the list from electronic medical records. Patient categorization according to their local government areas (LGAs) of residence was done. The test-eligible patients were assigned to the Orphan and Vulnerable Child Community-Based Organizations (OVC-CBOs) that provided services in the LGAs. The OVC case managers called the caregivers ahead of the visits to obtain informed consent for the home visits. They provided escort services for the test-eligible children to the viremia clinics on Saturdays. Transport services were provided using mini-buses and tricycles. The confidentiality concerns were managed appropriately during the implementation by ensuring that caregivers were contacted and consent was sought. The State Ministry of Health issued a Letter of Identification to the case managers to facilitate easy community entry. During the viremia clinic sessions, ART clinicians and nurses supported health education and health promotion sessions for clients, patient-centered adherence supports, and refill services while the phlebotomists collected samples from eligible CLHIV. Recreational utilities were built by the implementing partners (IP) to attract HIV-positive children to clinics. The program data for this period was analyzed. Also, a caregiver satisfaction survey was conducted at the end of the intervention using a Patient Satisfaction Survey questionnaire (PSSV). The PSSV is a 5-item survey on a 3-point scale for measuring patient satisfaction. A score of one (1), two (2), and three (3) is awarded to each stem. The least score is 5 while the maximum score is 15. A total score of 10 to 15 denotes "satisfaction", while below 10 is not satisfied¹². Specifically, caregivers were asked questions regarding their satisfaction with interaction with healthcare staff, the wait time for services, the quality of services received, the satisfaction with feedback on their questions, and the perceived relationship with the healthcare staff. Descriptive statistics were used in the data analysis while graphs, charts, and tables were used for data presentation.

III. RESULTS

A total of 22,495 test-eligible HIV-positive pediatrics and adolescents accessed the viral load services at one period or the other during the three-year period with 46% of them seen in the third year alone. The gender distributions were 10,649(47%) males and 11846 (53%) females (Figure 1).

YEAR	GENDER	
	Male	Female
2020	2,191	2,186
2021	3,652	4,031
2022	4,806	5,629
Total	10,649	11,846
% gender	47	53

Fig 1: Gender distribution of HIV-positive pediatric and adolescents that accessed viral load services from 2020 to 2022.

The viral load coverage increased significantly from 79% to 84% in 2020 and rose to 87% and 89% in 2021 and 2022 respectively. The viral suppression rate increased from 56% to 80% in 2020 and 92% and 95% in 2021 and 2022 respectively (Figure 3).

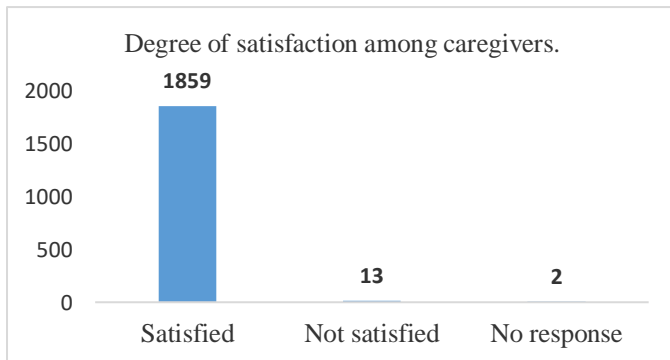


Fig 2: degree of satisfaction among the caregivers who accompanied HIV-positive children to the viremia clinics.

The majority of the respondents were female 1518 (81%) compared to male 356 (19%).

The majority 1859 (99%) of the respondents stated that they were satisfied with the quality of services.

IV. DISCUSSION

The funder’s enablers encouraged the participation of patients in the program as it was convenient and free for the patients and the caregivers. In addition to the funder’s enablers, the age-appropriate recreational activities contributed to greater attendance during clinic sessions and ultimately, the viral load outcomes. The settings also provided fora for HIV-positive pediatrics and adolescents to interact and share ideas about their disease¹³.

These child-friendly healthcare services encourage the greater participation of the caregiver in the management of this chronic disease¹⁴. On some occasions, the OVC case managers leveraged the home visits to identify and refer siblings of the HIV-positive children who were at substantial risk of HIV infection to family index testing services¹⁵. Although this intervention improved viral load outcomes, there were bottlenecks during its implementation. Lack of transport funds and inaccessibility to ART centers were often the challenges that a number of CLHIV that lived in hard-to-reach areas faced¹⁶. As trialed in Zambia, a discussion was held with stakeholders to establish pediatrics and adolescent viral load sample hubs in the hard-to-reach areas to facilitate viral load sample collection and transport to reference laboratories¹⁷. The sustainability of the weekend viremia clinic services for the pediatric population after the end of the 4GATES project was a concern that called for robust stakeholders’ engagement. This intervention left us with the key consideration that there is a need to understudy the feasibility of utilizing point-of-care (POC) viral load testing devices in rural community settings as a strategy to upturn the viral load coverage and suppression among HIV-positive pediatrics and adolescents.

V. CONCLUSION

The implementation science behind public health programs is fast evolving. In our context, we faced a significant challenge in optimizing viral load services for the HIV-positive pediatrics and adolescent population and the implementation of weekend viremia clinic services was a panacea. We feel that sharing our lessons widely would help other public health implementers navigate through similar problems in their climes.

➤ *Declaration of interests.*

There is no interest to declare from the authors.

➤ *Responsibilities.*

CKO was responsible for drafting the manuscript with critical inputs from OCU, OIN, OO, EA, and OJO. BF and EOE oversaw the data analysis while OIP and EA supervised the mobilization of CLHIV by the OVC case managers. They read and adopted the final paper.

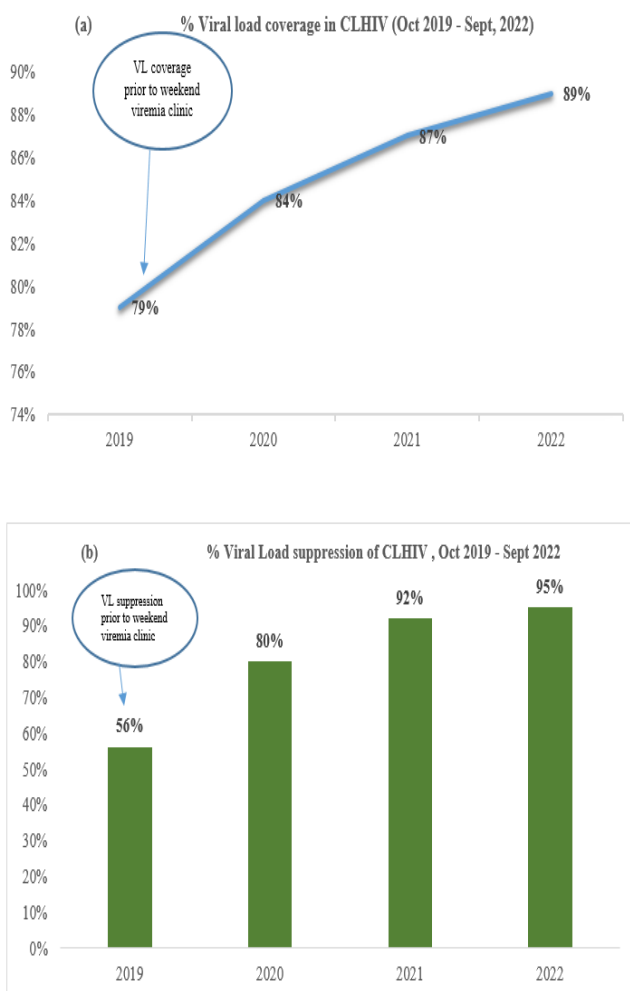


Fig 3: Percentage of viral load coverage and suppression in HIV-positive children/adolescents in Enugu state, south-east Nigeria. Abbreviations: CLHIV, Children living with HIV, VL, Viral load.

A total of 1,874 caregivers were surveyed on their level of satisfaction with the services during the weekend viremia

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