

Prevalence of HIV/AIDS among Pregnant Women in Some Selected Hospitals in Port Harcourt, Nigeria

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Abstract: The study examined the prevalence of HIV among pregnant women in three selected hospitals in Port Harcourt namely; military hospital, St. Margaret maternity home and El-Joe dam specialist hospital. This study was aimed at determining the Prevalence of HIV/AIDS among pregnant women in Port Harcourt, Nigeria. The population of the study was all the pregnant women that registered for antenatal at the three selected hospitals. The sample size was 400 randomly selected. 300 pregnant women were sampled at Military hospital, 50 each at St. Margaret maternity home and EL-Joe dam specialist hospital. The "prevalence of HIV /AIDS a close-ended questionnaire" used to collect data. The results were tabulated. The blood sample for the test was collected by vein puncture into EDTA. The confirmatory test was done using ELISA, PCR and western blot Methods. A relatively high number of seropositive women fell in the age brackets of 30-34 which is 42.11% years while the least prevalence was between the ages of 20-24 years. Out of the four hundred (400) subjects screened thirty-eight seropositive which can be translated to a prevalence of 9.5% in Port Harcourt. The research work indicates that there is high HIV prevalence among pregnant women more especially during their sexual active age. The finding of this work is not at variance with work done in other parts of the world, based on the literature review. The research work indicates that there is HIV prevalence among pregnant women.

Keywords: Prevalence, ELISA, PCR, EDTA, Western Blot.

INTRODUCTION

In 1985, the first case of human immunodeficiency virus (HIV) was reported as "slim disease" [1]. In the absence of antiretroviral therapy (ART), the natural history of AIDS indicates that people will lose weight and eventually become wasted or severely underweight [2, 3]. However, overweight and obesity levels have been increasing in several sub-Saharan African countries [4-8]. These countries have been severely impacted by HIV infection and have had little or no ART until recently.

Nigeria is the most populous Black Country in Africa with population of about 140 million. It has diverse cultures with very high level of illiteracy compounded with some other inhibitions such as paucity of basic social needs including water, electricity and indeed several others.

There is dearth of information on the Prevalence of HIV/AIDS among pregnant women in Port Harcourt, Nigeria.

Aim and Objective

This study was aimed at determining the Prevalence of HIV/AIDS among pregnant women in Port Harcourt, Nigeria.

MATERIALS AND METHODS

Research Design

The study was non-experimental and analytical survey. A total of three selected hospitals in Port Harcourt were used for the study made up of four hundred pregnant women. The hospitals include Military Hospital located at Aba Road, Port Harcourt, St. Margaret Maternity Home located at Agip Village, Rumueme Mile 4 Port Harcourt and El-Joedam Specialist Hospital located off Shell Location,

Mgbuoba, and Port Harcourt. The study was done between November 14, 2016 - August 19, 2017.

Ethical Approval

This was obtained from the Ethics Committee of the University of Port Harcourt. Women identified with a risk factor were offered HIV Rapid testing (Screening test) after pre-test counseling, using a structured flip chart as a discussion guide. The discussion focused on HIV transmission routes, benefits of knowing one's HIV status during pregnancy and ART prophylaxis/ treatment available. Women who gave verbal informed consent had blood drawn by prick method.

Instrument for Data Collection

A questionnaire titled "Prevalence of HIV/AIDs Questionnaire" was designed by the researcher and face validated by her supervisor was used to collect data from the four hundred women attending antenatal booking clinic. The self-administered questionnaire written in English language comprising of eighteen multiple choice questions were administered on the pregnant women.

Sampling Method

The sample was selected through random sampling method.

Sample Size

Convenient sample size of four hundred (400) pregnant women drawn from the three Hospitals. Three hundred (300) from Military Hospital, fifty (50) each from St. Margret maternity home and El-Joedam specialist hospital.

Sample Collection

Five millilitre of blood was collected from each patient by venepuncture into EDTA bottles. HIV screening was carried out using rapid test method.

HIV 1 and 2 Test Procedure

Maternal HIV status was determined on-site by using Capillus HIV 1 and 2 test kit. Instruction from the manufacturer was strictly followed in the HIV test analysis. Briefly, each patient serum was tested for the presence of HIV antibodies using Capillus HIV 1 and 2. Women received their test report after thirty minutes same day. Thorough post-test counseling was done in all women irrespective of the results, thus improving women's general knowledge and awareness on HIV and various protection strategies according to their risk factor found.

Confirmatory Test Using ELISA Method

The ELISA (enzyme-linked immunosorbent assay) test was commonly employed to screen the pregnant women, while the western blot method was

used to confirm all positive cases. In the ELISA test (using ELISCAN HIV 1/2 from M/S Ranbaxy Diagnostics, New Delhi), the patients serum was added to a microplate well to which HIV antigens derived from HIV grown in human T lymphocytes have been attached. This mixture was then incubated for about 3 h. All antibodies to HIV present in the serum, bound to the HIV antigens. The plate was then washed to remove all other components of the serum. Subsequently an antihuman globulin together with an enzyme capable of altering a colour substrate were added and allowed to bind to the bound HIV antibody. Finally, the colour substrate was added. A colour change occurred if HIV antibody was present in the patients' serum [9].

Confirmatory Test Using PCR Method

The second method for screening and confirming HIV status is the Polymerase Chain Reaction (PCR) test is performed on whole blood collected in tubes containing EDTA anticoagulant. About 1.25ml of the blood is added to a ficoll Histopaque solution in a test tube and centrifuged. A positive control (HIV -1 positive blood) and a negative control (water) are prepared alongside the patient specimen. Under centrifugal force, Histopaque separates blood cells of different densities. The Peripheral blood mononuclear cell (PBMC) fraction, free of the red blood cells, is removed and put in a new test tube. The PBMCs are lysed with an enzyme to release the DNA. Specimens are now ready for PCR amplification. Patient specimens are tested in duplicate. Additional positive and negative controls that do not undergo specimen processing are tested. Using both types of controls can help elucidate the cause of run failures (which are extremely rare). Several microliters of the processed specimen and controls are added to tubes containing the PCR master mix. The master mix consists of DNA polymerase enzyme, deoxynucleoside triphosphates (building block for new strands of DNA), primers that bind specifically to the HIV gag gene, and a second set of primers that amplify a region of the beta-globin gene present in all human cells. The beta-globin primers act as an internal control for each specimen. Every patient specimen, regardless of the HIV-1 PCR result, must be positive for the beta-globin PCR product in order for the HIV-1 result to be properly interpreted. A negative beta-globin result indicates that PCR amplification was incomplete or did not occur. This could be caused by improper specimen processing, the presence of PCR inhibitors in the patient specimen, faulty reagents in the master mix or a thermal cycling failure [10]. The agarose gel electrophoresis procedure allows for the visualization of DNA after ethidium bromide staining and ultraviolet light illumination. All patients' specimens and controls (except the negative control containing water) must show the amplified beta-globin DNA in the agarose gel.

Both positive controls must also show the amplified HIV DNA in the agarose gel [10].

Confirmatory Test Using Western Blot Method

The Western blot was the primary method used to confirm all positive cases. In the analysis (using Qualicode HIV ½ from Immunetics Inc. USA), individual proteins of the HIV were separated by electrophoresis through a gel material. The proteins were then transferred (blotted) from the gel onto a nitrocellulose filter. The patient's serum was added to the filter and any antibodies to HIV bind to the specific proteins. Enzyme-labeled antibodies to human immunoglobulin were then added. These bound to any anti-HIV antibodies that attached to the nitrocellulose filter after reacting with viral proteins. All un-bound antibodies and proteins were removed by rinsing the filter. Detection of the bound complex was revealed by adding a colorless substance that the antibody-bound enzyme converted to a colour product. The "3 band rule" was used to interpret the result of the western blot procedure. If no viral bands were detected, the result was considered negative. Results were interpreted

as positive if bands appeared at the site of two or more of the following HIV antigens: p24, gp41 or gp120. The test was considered indeterminate if fewer than two of bands were present [11, 12]. Strict confidentiality was maintained for all patients.

Subjects included in this study were pregnant women attending clinic in the selected hospitals in Port Harcourt. Non-pregnant women attending clinic were excluded.

Statistical Analysis: Chi square test analysis was using Statistical Package for the Social Sciences (SPSS 22.0 version).

RESULTS

In Table-1 the results indicated that the pregnant women within the age 30 – 34 who attended clinic at Military hospital had 10 positive cases which were considered the highest number of cases amongst the three hospitals, in St Margaret 25 – 29 age bracket had 4 positive cases and El-Joedam had 4 positive cases as within 30 – 34 yrs.

Table-1: Age distribution of HIV among pregnant women in three selected Hospitals in Port-Harcourt, Nigeria

Hospitals	Age Interval	Total Number Screened	HIV Positive	HIV Negative
Military hospital	20 – 24	42	1	41
	25 – 29	91	5	86
	30 – 34	70	10	60
	35 – 39	70	4	66
	40 – 44	27	-	27
St. Margret	20 – 24	11	1	10
	25 – 29	17	4	13
	30 – 34	16	2	14
	35 – 39	5	1	4
	40 – 44	1	-	1
El-Joedam	20 – 24	10	2	8
	25 – 29	11	2	8
	30 – 34	14	4	10
	35 – 39	13	2	11
	40 – 44	2	-	2
Total		400	38	362

P < 0.05

In table-2 the results indicated that the pregnant women within the age 30 – 34 had 16 positive cases in total which were considered the most prone to the infection, those within 25 – 29 years of age were the

second most infected category with 11 cases, and the least infected category was 20 – 24 years with 4 recorded cases.

Table-2: Combination of the Results from the three Hospitals

Age Interval	Total Number Screened	HIV positive	HIV negative	% of HIV positive
20 – 24	63	4	59	10.53
25 – 29	119	11	108	28.95
30 – 34	100	16	84	42.11
35 – 39	88	7	81	18.42
40 – 44	30	-	30	-
Total	400	38	362	-

P < 0.05

DISCUSSION

The study was carried out using three selected hospitals in Port Harcourt which are Military Hospital, St. Margret Maternity Home and El-Joedam Specialist Hospital. Four hundred pregnant women of age group 20 – 44 were sampled. The age group was done with intervals of five showing group as 20 – 24years, 25 –

29years, 30 – 34years, 35 – 39years, 40 – 44years. The results showed that there was high HIV prevalence among pregnant women in the three (3) Hospitals in Port Harcourt. There were 38 seropositive cases among the four hundred (400) subjects under study. This can be translated to a prevalence of 9.5%.

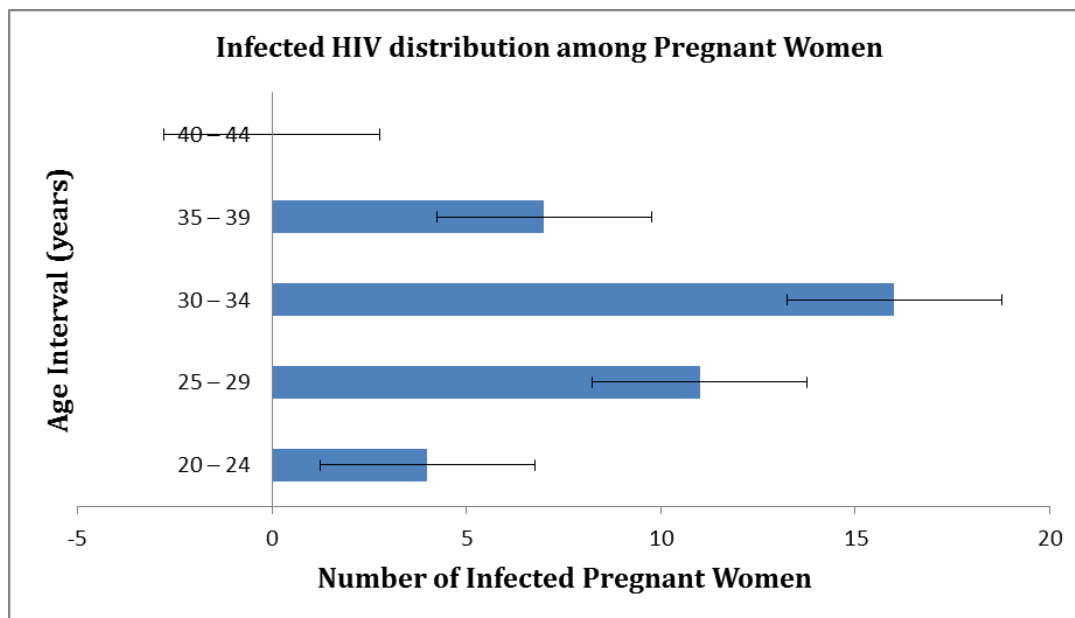


Fig-1: Infected HIV distribution among pregnant women

Considering the three hundred pregnant women screened in Military Hospital, twenty tested positive to HIV which is 6.67% of sample screened while out of fifty pregnant women screened at St. Margret Maternity home, eight tested positive to HIV which is 16% whereas, at El-Joedam Specialist Hospital, out of fifty pregnant women screened, ten tested positive to HIV which represent 20% of the sample screened.

The high number of infected pregnant women observed at St. Margret and El-Joedam might be due to the fact that the two hospitals are private (owned by individuals) where the patients believe they will get adequate attention and their data or information will be secretly kept compared to Military Hospital that is Government owned.

Age distribution of HIV among pregnant women in three selected hospitals

It was observed that there was a steady increase or prevalence of HIV from age group 20 – 24, 25 -29 and 30 -34. The highest prevalence of HIV (sixteen) which is 42.11% noticed in the age group 30 – 34years can be accounted for by the fact that, most women in this age group are conscious of bearing children and not necessarily conscious of the fact that

the same process of getting pregnant can as well expose them to Human Immunodeficiency Virus (HIV). Those that have cases of sub-fertility may have tried one fast game or the other. This high prevalence may be due to cumulative effects of careless or adventurous life style from teenage period to this very age group. However, the decline in prevalence of HIV in the age group 35 – 39years (7) which is 18.42% may be due to the fact that some of those that are seropositive must have been counseled against being pregnant. Secondly, some may have died before reaching this age group and also at this age, women may have become conscious of the prevalence of HIV in their environments.

Percentage distribution of HIV positive among pregnant women

The pie chart showed the percentage of the pregnant women that tested positive to HIV in the three selected hospitals under study. Out of the thirty-eight pregnant women that tested positive to HIV, twenty which represent 189.5° on the pie chart was from Military Hospital while ten pregnant women from St. Margret represent 94.70° and eight from El-Joedam stands for 75.8°. The clear difference between Military Hospital and the remaining two Hospitals was due to the fact that Military Hospital accounted for three hundred out of four hundred pregnant women sampled.

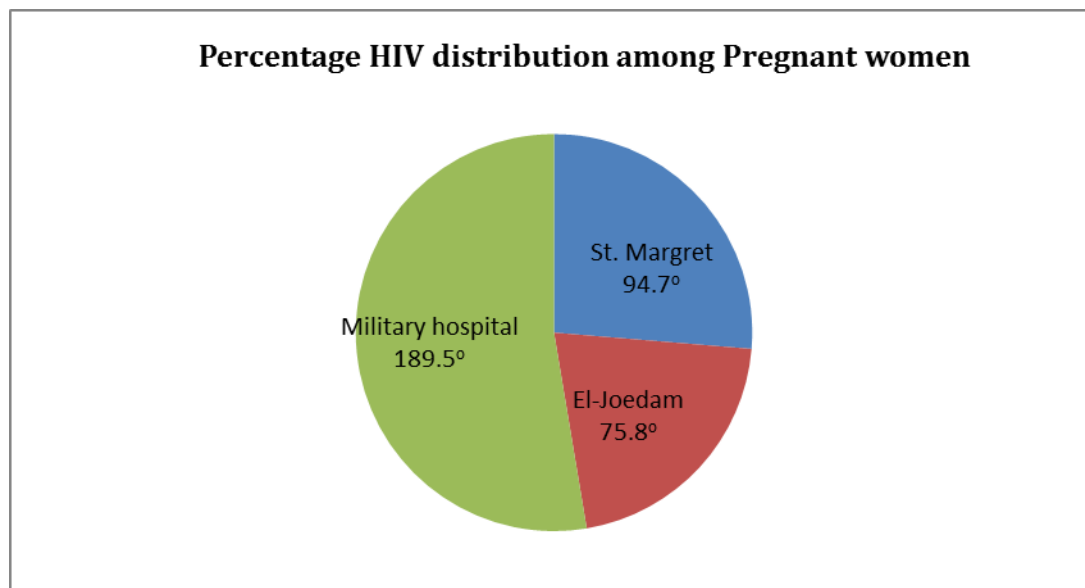


Fig-2: Percentage HIV distribution among pregnant women.

It is worth mentioning that though women were aware of the word 'AIDS' but general information about HIV was very poor. A few who know about HIV relate it with sex only and there was marginal knowledge about other routes of transmission. Pre-test counseling is a good strategy to improve their awareness. In addition, even though HIV/AIDS is associated with stigma, initially many of them were not willing to be tested. However, thorough pre-test counseling helped them to understand benefits of testing. Topics covered in pre-test sessions included routes of transmission, benefits and method of HIV testing and various protection strategies. It was noted that the age group 30-34 years had the highest prevalence despite the fact that the number screened for this group was not the highest. This could be due to the fact that the women in this group are more exposed to the risk factors that predispose to the infection. The age group 20 – 24 years had the least prevalence. The 38 seropositive cases among the four hundred subjects can be translated to a prevalence of 9.5%.

Comparing the prevalence of 9.5% in the three Hospitals and 6.0% of the entire state showed a significant increase in HIV prevalence among pregnant women in Rivers State. It is pertinent to mention that Rivers State HIV epidemic has remained consistently higher than the National average since 2016 [8, 13]. The findings of this study agree with the report of Federal Ministry of health senital survey [14].

Infection with HIV represents something of an immunological paradox, in that HIV induces a strong antiviral immune response, whilst simultaneously and progressively disrupting the ability of the immune system to respond to new infections and antigens, ultimately leading to severe immune deficiency of the

cell-mediated immune system [15-17]. HIV, unlike other viruses has a unique ability to escape detection by the immune system [18-20]. This is however made possible by the replication machinery of the virus which is so inaccurate that it generates new mutants for virtually every virion produced in an infected individual, thus, creating a myriad of new and unique viral particles every day. These mutant viruses keep continually damaging or killing the cells of the immune system (mainly CD4+ lymphocytes) and, thus progressively destroy the body's ability to fight opportunistic infections and certain years [21-23]. Seropositive women or women with seropositive sexual partners are at increased risk of acquiring AIDS. If they become pregnant, their off springs are also at high risk of acquiring AIDS [24-26]. In a recent study [19], confirmed that occult hepatitis B virus (HBV) infection which we [27-30] found to be highly prevalent among pregnant women in Nigeria, could be reactivated by infection of HIV.

CONCLUSION

This study attempted to add to the pool of information on HIV prevalence in Port Harcourt, Rivers State. It also tried to compare prevalence in both Public and private Hospitals and gave reason for differences noticed. The prevalence of HIV among pregnant women in the three selected hospitals in Port Harcourt is 9.5% study revealed that: there is high HIV prevalence among pregnant women in the three Hospitals. This result is not at variance with work done in other parts of the World.

LIMITATION OF THE STUDY

This study was limited to pregnant women who attend clinic in the Hospitals sampled in Port Harcourt, Nigeria.

RECOMMENDATIONS

Based on the findings here are few recommendations: more effort should be made to enhance the ongoing campaigns on HIV/AIDS in order to adequately sensitize the public, more education should be given about the means of transmission, if a pregnant woman should test positive, the spouse should be invited for screening and counseling and larger samples should be used for further studies in order to make generalizations.

REFERENCES

- Trickey, A., May, M. T., Vehreschild, J. J., Obel, N., Gill, M. J., Crane, H. M., ... & Cavassini, M. (2017). Survival of HIV-positive patients starting antiretroviral therapy between 1996 and 2013: a collaborative analysis of cohort studies. *The Lancet HIV*, 4(8), e349-e356.
- Wandeler, G., Johnson, L. F., & Egger, M. (2016). Trends in life expectancy of HIV-positive adults on antiretroviral therapy across the globe: comparisons with general population. *Current Opinion in HIV and AIDS*, 11(5), 492-500.
- Evans, C. (2005). Toolkit for targeted HIV/AIDS prevention and care in sex work settings.
- Centers for Disease Control and Prevention. (2014). Strategic plan division of HIV/AIDS prevention 2011 through 2015. 2011.
- Joint United Nations Programme on HIV/AIDS., UNICEF., & World Health Organization. (2008). *Children and AIDS: Second stocktaking report*. UNICEF.
- Awofala, A. A., & Ogundele, O. E. (2016). HIV epidemiology in Nigeria. *Saudi Journal of Biological Sciences*.
- Hardee, K., Gay, J., Croce-Galis, M., & Afari-Dwamena, N. A. (2014). What HIV programs work for adolescent girls?. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 66, S176-S185.
- National Agency for the Control AIDS (NACA, 2017).
- Okonkwo, U., Ameh, S., Otu, A., & Okpara, H. (2017). HIV-related knowledge, attitude and practices of healthy adults in Cross River State Nigeria: a population based-survey. *The Pan African medical journal*, 27.
- McHugh, G., Simms, V., Dauya, E., Bandason, T., Chonzi, P., Metaxa, D., ... & Ferrand, R. A. (2017). Clinical outcomes in children and adolescents initiating antiretroviral therapy in decentralized healthcare settings in Zimbabwe. *Journal of the International AIDS Society*, 20(1).
- Brima, N., Lampe, F. C., Copas, A., Gilson, R., Williams, I., Johnson, M. A., ... & Smith, C. J. (2017). Early virological response to HIV treatment: can we predict who is likely to experience subsequent treatment failure? Results from an observational cohort study, London, UK. *Journal of the International AIDS Society*, 20(1).
- Pantelic, M., Boyes, M., Cluver, L., & Meinck, F. (2017). HIV, violence, blame and shame: pathways of risk to internalized HIV stigma among South African adolescents living with HIV. *Journal of the international AIDS society*, 20(1).
- International AIDS Conference (AIDS, 2016).
- HIV/AIDS Estimate (2015).
- MacQueen, K. M. (2017). Young people, HIV, and life goals. *Journal of the International AIDS Society*, 20(1).
- Eba, P. M., & Lim, H. (2017). Reviewing independent access to HIV testing, counselling and treatment for adolescents in HIV-specific laws in sub-Saharan Africa: implications for the HIV response. *Journal of the International AIDS Society*, 20(1).
- Callahan, T., Modi, S., Swanson, J., Ng'eno, B., & Broyles, L. N. (2017). Pregnant adolescents living with HIV: what we know, what we need to know, where we need to go. *Journal of the International AIDS Society*, 20(1).
- Bourne, A., Cassolato, M., Wei, T., Koh, C., Wang, B., Pang, J., ... & Mburu, G. (2017). Willingness to use pre-exposure prophylaxis (PrEP) for HIV prevention among men who have sex with men (MSM) in Malaysia: findings from a qualitative study. *Journal of the International AIDS Society*, 20(1).
- Mpawa, H., Kwekwesa, A., Amberbir, A., Garone, D., Divala, O. H., Kawalazira, G., ... & Oosterhout, J. J. (2017). Virological outcomes of antiretroviral therapy in Zomba central prison, Malawi; a cross-sectional study. *Journal of the International AIDS Society*, 20(1).
- Grebely, J., Dore, G. J., Morin, S., Rockstroh, J. K., & Klein, M. B. (2017). Elimination of HCV as a public health concern among people who inject drugs by 2030—What will it take to get there?. *Journal of the International AIDS Society*, 20(1).
- Pollock, L. C., Weber, S., Kaida, A., Matthews, L. T., & Seidman, D. L. (2017). HIV-affected couples and individuals who desire children should be offered options for safer conception. *Journal of the International AIDS Society*, 20(1).
- Draper, B. L., Oo, Z. M., Thein, Z. W., Aung, P. P., Veronese, V., Ryan, C., ... & Stoové, M. (2017). Willingness to use HIV pre-exposure prophylaxis among gay men, other men who have sex with men and transgender women in Myanmar. *Journal of the International AIDS Society*, 20(1).
- Haberer, J. E., Kidoguchi, L., Heffron, R., Mugo, N., Bukusi, E., Katabira, E., ... & Baeten, J. M. (2017). Alignment of adherence and risk for HIV acquisition in a demonstration project of pre-exposure prophylaxis among HIV serodiscordant

- couples in Kenya and Uganda: a prospective analysis of prevention-effective adherence. *Journal of the International AIDS Society*, 20(1).
24. Sidibé, M., Loures, L., & Samb, B. (2016). The UNAIDS 90–90–90 target: a clear choice for ending AIDS and for sustainable health and development. *Journal of the International AIDS Society*, 19(1).
25. Margolis, D. M., Salzwedel, K., Chomont, N., Psomas, C., Routy, J. P., Poli, G., & Lefeuvre, A. (2016). Highlights from the seventh international workshop on HIV persistence during therapy, 8–11 December 2015, Miami, Florida, USA. *Journal of virus eradication*, 2(1), 57.
26. Koch, A. S., Brites, D., Stucki, D., Evans, J. C., Seldon, R., Heekes, A., ... & Warner, D. F. (2017). The Influence of HIV on the Evolution of *Mycobacterium tuberculosis*. *Molecular biology and evolution*, 34(7), 1654-1668.
27. Spragg, C., Felix, H. D. S., & Jerome, K. R. (2016). Cell and gene therapy strategies to eradicate HIV reservoirs. *Current Opinion in HIV and AIDS*, 11(4), 442.
28. Guzzo, C., Ichikawa, D., Park, C., Phillips, D., Liu, Q., Zhang, P., ... & Arthos, J. (2017). Virion incorporation of integrin $\alpha 4\beta 7$ facilitates HIV-1 infection and intestinal homing. *Science immunology*, 2(11).
29. Haas, A. D., van Oosterhout, J. J., Tenthani, L., Jahn, A., Zwahlen, M., Msukwa, M. T., ... & Chimbandira, F. (2017). HIV transmission and retention in care among HIV-exposed children enrolled in Malawi's prevention of mother-to-child transmission programme. *Journal of the International AIDS Society*, 20(1).
30. Hussen, S. A., Chakraborty, R., Knezevic, A., Camacho-Gonzalez, A., Huang, E., Stephenson, R., & del Rio, C. (2017). Transitioning young adults from paediatric to adult care and the HIV care continuum in Atlanta, Georgia, USA: a retrospective cohort study. *Journal of the International AIDS Society*, 20(1).