Acta Scientific Women's Health (ISSN: 2582-3205)

Volume 5 Issue 1 January 2023

Review Article

HIV During Pregnancy: Downsizing Mother to Child Transmission

Asha KV*

Assistant Professor, Government College of Nursing, Thruvananthapuram, India

***Corresponding Author:** Asha KV, Assistant Professor, Government College of Nursing, Thruvananthapuram, India.

DOI: 10.31080/ASWH.2023.05.0458

Received: November 17, 2022

Published: December 26, 2022

Abstract

Yearly more than 1.3 million women with HIV get pregnant all over the world. There is a 15 - 45 percentage risk of transmitting of HIV to the newborn during pregnancy, labour and puerperium if left unattended. Thus prevention of mother to child transmission of HIV is highly recommended under the umbrella of maternal, newborn, child and adolescent health services and public health system. Appropriate management of mother during pregnancy, labour and puerperium definitely helps in reducing the transmission of HIV from mother to child. Antiretroviral therapy with combination of drugs is a legitimate intervention in order to minimise the risk of mother to child transmission. Special precautions are necessary while conducting delivery. As breast feeding increases the risk for transmission, it should be informed to the mother to make choice regarding this.Transmission rates can be reduced to below 5% with appropriate management.

Keywords: HIV; Pregnancy; Transmission

Introduction

Yearly more than 1.3 million HIV (Human Immunodeficiency Virus) positive women get pregnant all over the world. There is a 15 - 45 percentage risk of transmitting of HIV to the newborn during pregnancy, labour and puerperium if left unattended. Thus prevention of mother to child transmission of HIV is highly recommended under the umbrella of maternal, newborn, child and adolescent health services and public health system [1]. Preventing mother to child transmission of HIV is a major challenge for the community health in India. Prevalence of mother to child transmission is 8.78%. More interventions for pregnant women, prophylaxis for infants and ideal methods of conduction of delivery are needed to minimise such transmission [2].

The national prevention of parent to child transmission (PPTCT) programme of India outlines four elements included under the strategy for prevention of HIV transmission among women and children. They are Primary prevention of HIV (especially among women of child bearing age), prevention of unintended pregnancies among wome n with HIV, prevention of HIV transmission from pregnant women infected with HIV to their child as well as provision of care, support and treatment to women living with HIV, her children and family [3].

Strategies for prevention of mother to child transmission (MTCT)

Early detection and initiation of treatment for HIV is highly essential for the reduction in viral load which will be reducing the risk of transmission to newborns. It can be started in the pre conceptional phase itself if the woman is hiv positive. Effective antiretroviral therapy (ART) is strongly beneficial to reduce the mother-to-child HIV transmission to less than 5%. Supporting them during pregnancy, delivery, and breastfeeding is also highly essential [4].

Pre conceptional care

In women who are HIV positive, viral load should be minimised when they are planning to get pregnant. It has got multiple benefits. Anti retroviral therapy (ART) can be started for those patients. Initiation of ART before conception not only prevents sexual transmission between partners, it also reduces perinatal transmission of HIV [5].

Namibia has achieved reduction of MTCT to 1.74%. They have adopted ealy HIV diabnosis and initiation of treatment before pregnancy [6].

In order to avoid the risk of sexual transmission of HIV, among partners with HIV positive women and HIV negative men, assisted insemination is useful. If the partners include an HIV positive man and an HIV negative woman, sperm preparation techniques combined with intrauterine insemination or in vitro fertilization may be beneficial. Insemination with donor sperm is also used in these cases. In couples where both partners are HIV positive, it is recommended to start ART and attain sustained viral suppression before trying to conceive [7].

Inflammation of genital tract which is seen in genital tract infections, increases HIV viral shedding. So it is necessary to screen both partners for genital tract infections before conception [8].

Interventions during pregnancy

When a pregnant woman is diagnosed with HIV, ART should be initiated immediately. Similarly when a HIV affected woman gets pregnant, ART should be initiated [9]. Use of combination of drugs are better than using single drug for ART [10]. Even a single NRTI (Nucleotide reverse transcriptase inhibitors) drug with adequate trans-placental transfer must be added to the regimen for ideal pre-exposure prophylaxis of fetus [11].

Two NRTIs with a third integrase inhibitor or protease inhibitor is the preferred regimen. Tenofovir disoproxil fumarate-emtricitabine (TDF-FTC) or abacavir-lamivudine are generally used NRTI combinations. Tenofovir is avoided in patients with significant renal failure. [12] Popular third drug choices include the once-daily dose of the highly virologic integrase inhibitor dolutegravir (DTG) (associated with a small increased risk of neural tube defects (NTDs) with use at the time of conception) or twice-daily dosing of another highly virologic integrase inhibitor raltegravir (more prone to drug resistance) [13]. Another popular choice of a third agent is a protease inhibitor e.g., once-daily dosing of atazanavir-ritonavir (can cause indirect hyperbilirubinemia in mother) or twice-daily dosing of darunavir-ritonavir [14]. For women who become pregnant while on ART with adequate viral suppression, continuing the same regimen during pregnancy is strongly encouraged [15].

For women who become pregnant while on ART but without sustained suppression of the virus should be evaluated about drug adherence, and resistance testing should be done. Agents not usually recommended for use during pregnancy may be prescribed in this case. Once-daily dosing is preferred, and if there is still no viral suppression, repeat drug resistance testing should be done [16].

Women who were previously on ART but not currently taking it should be evaluated thoroughly about past drug regimens, virologic efficacy, past drug tolerability, and past resistance testing. Again, agents not usually preferred in pregnancy may be used in such cases. Patient adherence should be stressed, and viral response closely monitored.

For women with high viral load (treatment naïve or experienced) presenting late in pregnancy, the use of integrase inhibitors e.g., dolutegravir, has been found to result in a rapid decrease in HIV RNA load [17]. If an ART regimen has to be stopped during pregnancy e.g., due to drug toxicity, hyperemesis gravidarum, acute illness or lack of availability of drugs, all component drugs of the regimen must be discontinued together, and the priority should be to restart an ART regimen as soon as possible again [18]. The clients should be informed about the need for right adherence to the ART regime, in order to have adequate viral suppression [19]. The possible side effects of ART should be informed to the patients [20].

Precautions for labour

Persons with HIV RNA viral load more than 1000 copies/ml or levels are not known at term, they are to be delivered by elective cesarean section at 38 weeks [21].

Cesarean section is not suggested when HIV RNA viral load is less than 1000 copies/ml, and if the patient is on ART. HIV positive persons have more risk for complications of cesarean section than HIV negative women [22].

In cases when HIV RNA is less than1000 copies/ml, the timing of vaginal delivery can be decided considering the regular obstetric guidelines. If a elective cesarean delivery is performed for routine indications (other than HIV prevention) and HIV RNA is less than 1000 copies/mL, it should be performed at 39 weeks [23].

If a woman with HIV RNA >1000 copies/ml presents before 37 weeks with ruptured membranes or spontaneous labor, her individualized management plan should be decided after consulting with a perinatal HIV expert. If a woman presenting with ruptured membranes has HIV RNA less than 1000 copies/ml, there is no increased risk of perinatal HIV transmission, and there is no indication for cesarean delivery.

Artificial rupture of membrane for obstetrical indications can only be done if the patient is on ART with sustained viral suppression, though it should be used as a last alternative due to the risk of transmission of the virus due to injury to the fetus during the procedure. It must be avoided in women with detectable viral loads. Fetal scalp electrodes, forceps, or vacuum-assisted delivery should be avoided in all HIV positive women.

Routine ART regimen should be continued during labour. If HIV RNA is more than 1000 copies/ml at the time of delivery, then IV (intravenous) Zidovudine (ZDV) infusion should be started 3 hours prior to the scheduled cesarean section in addition to oral administration of routine ART regimen [24].

If the routine ART regimen consists of ZDV, it can be stopped during this period of IV ZDV infusion. ZDV infusion must be given whenever HIV RNA is more than 1000 copies/mL at the time of delivery, even if ZDV was not a part of the routine ART regimen due to ZDV resistance. ZDV rapidly crosses the placenta and builds ART drug levels in the fetus's system before it is exposed to the mother's genital secretions and blood during delivery, which contains HIV [25].

Management during puerperium

Comprehensive care plans involving obstetrical care, primary care, HIV specialists, pediatric care, mental health, and supportive care must be provided to HIV positive women in the postpartum period. ART for the mother and the newborn must be provided before hospital discharge, and the first follow-up visit to the HIV-care provider must happen within 2-4 weeks of discharge. These measures are of particular importance to women who have HIV diagnosed during delivery/ labor and maximize the chances of successful viral suppression [26].

Postpartum adherence to ART is often challenging, and the continuation of postpartum ART must be stressed. In the postpartum phase, the choice of ART should be carefully tailored according to factors like the desire for future pregnancies, choice of contraceptives, and any potential drug interactions. Patients must be counseled about contraceptive use and informed about the earlier return of ovulation in the absence of breastfeeding [27]. HIV positive women can safely use all methods of contraception [28]. Postpartum depression is significantly high among HIV positive women, and all HIV positive women must be screened for it during puerperium [29].

Prophylaxis for newborns

Infants born to HIV positive mothers should be given ART post-exposure prophylaxis within 6 to 12 hours of delivery. Infants born to mothers with viral suppression should receive ZDV for four weeks unless the mother had genital ulcers or excessive bleeding or other STIs at the time of delivery, in which case the infant should receive the same care as that given to an infant born to a mother without viral suppression. Infants born to mothers with no viral suppression (HIV RNA more than 50copies/ml) should receive a two-drug (ZDV and nevirapine) or three-drug (ZDV, lamivudine, and either nevirapine or raltegravir) for six weeks [25].

Hemoglobin and neutrophil counts should be measured every four weeks if an infant is receiving ZDV and lamivudine regimen. TMP-SMX (Trimethoprim- Sulphamethoxazole) prophylaxis against PCP (Pneumocystis Carinii Pneumonia) is started after 4 or 6 weeks ART prophylaxis has finished in an infant born to a HIV positive mother unless definite test results are available to rule out HIV infection in the newborn. In infants less than 18 months, viral assays (HIV RNA or HIV DNA nucleic acid test (NAT)) are used to diagnose HIV. No antigen-antibody assays should be used. All infants born to HIV positive mothers are tested with NATs at 14 to 21 days, 1 to 2 months, and 4 to 6 months. If an infant is at high risk of HIV transmission (e.g., no viral suppression in the mother), additional NATs should be performed at birth and at 2 to 3 months.

In utero or neonatal exposure to HIV or ART drugs must be documented in a child's long-term medical records even if the child

is HIV negative. This is important because many such children have mitochondrial abnormalities leading to the development of disorders of the heart and nervous system in later life [30]. In the US official guidelines by the Panel on Treatment of Pregnant Women with HIV Infection and Prevention of Perinatal Infection state that breastfeeding must be avoided by HIV positive women because viral transmission through breast milk is possible despite ART suppression and also because of the risk of ART drug toxicity to the infant via breast milk. Women must be counseled about the various pharmacological and non-pharmacological options available to deal with painful breast engorgement when not breastfeeding [31]. Even though breast feeding is a major determinant of transmission rate, safe alternative feeding provision are not available in poor countries. So HIV positive women must be given the information regarding the pros and cons of both type of feeding to make informed choice [32].

Barriers in implementation

Cost and the infrastructure are the major barriers in under developed countries. Voluntary counselling and testing facilities are not available every where. When institutional deliveries are not possible, protection of babies by medication is not feasible. Stigmatisation of the disease makes it difficult to have screening, drug therapy, and alternate baby feeding practices [32]. Improved access to ART and appropriate infant feeding practices aids in PMTCT. Loss to follow up of exposed infants is a challenge and needs strategies for their retention [33].

Conclusion

HIV can be transmitted from infected mother to her fetus through the placenta during pregnancy or during delivery or during breast feeding. Peripartum transmission accounts for one third to two thirds of overall numbers infected. Therefore prevention efforts should make focus on this. Mother to child transmission can be prevented by ART prophylaxis, elective caesarean section and avoidance of breast feeding.

Bibliography

1. WHO. "Mother to child transmission of HIV – Global HIV programme" (2022).

2. Bhatta M., *et al*. "Mother to child HIV transmission and its correlates in India: systematic review and meta analysis". *BMC Pregnancy Childbirth* 20 (2020): 509.

3. NACO, Prevention of Parent to Child Transmission (PPTCT) of HIV using Multi Drug Anti-retroviral Regimen in India Updated Guidelines for December (2013)

4. Elizabeth glaser pediatric AIDs foundation, Prevention of mother to child transmission.

5. Mandelbrot L., *et al*. "No perinatal HIV-1 transmission from women with effective antiretroviral therapy starting before conception". *Clinical Infectious Diseases* 61.11 (2015): 1715-1725.

6. Agabu A., *et al*. "National level effectiveness of ART to prevent early mother to child transmission of HIV in Namibia". *Plos ONE* 15.11 (2020).

7. Usama Irshad., *et al*. "HIV In Pregnancy". StatPearls Publishing LLC (2022).

8. Mitchell C., *et al*. "Cervicovaginal shedding of HIV type 1 is related to genital tract inflammation independent of changes in vaginal microbiota". *AIDS Research and Human Retroviruses* 27.1 (2011): 35-39.

9. Scott GB., *et al*. "Missed Opportunities for Prevention of Mother-to-Child Transmission of Human Immunodeficiency Virus". *Obstetrics and Gynecology* 129.4 (2017): 621-628.

10. Fowler ., *et al*. "Benefits and Risks of Antiretroviral Therapy for Perinatal HIV Prevention". *The New England Journal of Medicine* 375.18 (2016): 1726-1737.

11. McCormack SA and Best BM. "Protecting the fetus against HIV infection: a systematic review of placental transfer of antiretrovirals". *Clinical Pharmacokinetics* 53.11 (2014): 989-1004.

12. Sibiude J., *et al*. "In utero exposure to zidovudine and heart anomalies in the ANRS French perinatal cohort and the nested PRIMEVA randomized trial". *Clinical Infectious Diseases* 61.2 (2015): 270-280.

13. Zash R., *et al*. "Neural-Tube Defects with Dolutegravir Treatment from the Time of Conception". *The New England Journal of Medicine* 379.10 (2018): 979-981.

14. Powis KM., *et al*. "Increased risk of preterm delivery among HIV-infected women randomized to protease versus nucleoside reverse transcriptase inhibitor-based HAART during pregnancy". *Journal of Infectious Diseases* 204.4 (2011): 506-514.

15. Boyd SD., *et al*. "Cobicistat-containing antiretroviral regimens are not recommended during pregnancy: viewpoint". *AIDS* 33.6 (2019): 1089-1093.

16. Patel M., *et al*. "HIV RNA Suppression during and after Pregnancy among Women in the HIV Outpatient Study, 1996 to 2015". *Journal of the International Association of Providers of AIDS Care* 17 (2018): 2325957417752259.

17. Waitt C., *et al*. "Safety and pharmacokinetics of dolutegravir in pregnant mothers with HIV infection and their neonates: A randomised trial (DolPHIN-1 study)". *PLoS Medicine* 16.9 (2019): e1002895.

18. Galli L., *et al*. "Italian Register for HIV Infection in Children. Is the interruption of antiretroviral treatment during pregnancy an additional major risk factor for mother-to-child transmission of HIV type 1?" *Clinical Infectious Diseases* 48.9 (2009): 1310-1317.

19. Katz IT., *et al*. "Factors associated with lack of viral suppression at delivery among highly active antiretroviral therapy-naive women with HIV: a cohort study". *Annals of Internal Medicine* 162.2 (2015): 90-99.

20. Grignolo ., *et al*. "Pregnancy and neonatal outcomes among a cohort of HIV-infected women in a large Italian teaching hospital: a 30-year retrospective study". *Epidemiology Infection* 145.8 (2017): 1658-1669.

21. "ACOG Committee Opinion No. 751: Labor and Delivery Management of Women With Human Immunodeficiency Virus Infection". *Obstetrics and Gynecology* 132.3 (2018): e131-e137.

22. Kourtis AP., *et al*. "Complications of cesarean deliveries among HIV-infected women in the United States". *AIDS* 28.17 (2014): 2609-2618.

23. Tita AT., *et al*. "Timing of elective repeat cesarean delivery at term and neonatal outcomes". *The New England Journal of Medicine* 360.2 (2009): 111-120.

24. Rodman JH., *et al*. "Systemic pharmacokinetics and cellular pharmacology of zidovudine in human immunodeficiency virus type 1-infected women and newborn infants". *Journal of Infectious Disease* 180.6 (1999): 1844-1850.

25. Nielsen-Saines K., *et al*. "Three postpartum antiretroviral regimens to prevent intrapartum HIV infection". *The New England Journal of Medicine* 366.25 (2012): 2368-2379.

26. Anderson EA., *et al*. "Assessing the Impact of Perinatal HIV Case Management on Outcomes Along the HIV Care Continuum for Pregnant and Postpartum Women Living With HIV, Philadelphia 2005-2013". *AIDS Behavior* 21.9 (2017): 2670-2681.

27. Jackson E and Glasier A. "Return of ovulation and menses in postpartum nonlactating women: a systematic review". *Obstetrics and Gynecology* 117.3 (2011): 657-662.

28. Polis CB and Curtis KM. "Use of hormonal contraceptives and HIV acquisition in women: a systematic review of the epidemiological evidence". *Lancet Infectious Disease* 13.9 (2013): 797-808.

29. O'Connor E., *et al*. "Primary Care Screening for and Treatment of Depression in Pregnant and Postpartum Women: Evidence Report and Systematic Review for the US Preventive Services Task Force". *JAMA* 315.4 (2016): 388-406.

30. Jao J and Abrams EJ. "Metabolic complications of in utero maternal HIV and antiretroviral exposure in HIV-exposed infants". *Pediatric Infectious Disease Journal* 33.7 (2014): 734-740.

31. "ACOG Committee Opinion No. 736: Optimizing Postpartum Care". *Obstetrics and Gynecology* 131.5 (2018): e140-e150.

32. Mclntyre J and Gray G. "What can we do to reduce mother to child transmission of HIV". *BMJ* 324.7331 (2002): 218-221.

33. Anoje C., *et al*. "Reducing mother to child transmission of HIV: findings from an early infant diagnosis program in south-south region of Nigeria". *BMC Public Health* 184.12 (2012).