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Review Article

HIV in pregnancy

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ABSTRACT

HIV is a disease caused by retrovirus (HIV-1 or HIV-2) that attacks the immune system of the body, leaving it susceptible to various dangerous infections. HIV can have profound effects on pregnancy and pregnancy may in turn cause an aggravation of signs and symptoms of HIV. A pregnant woman living with HIV can pass on the virus to her baby during pregnancy, childbirth and through breastfeeding. This is called Vertical transmission of HIV. Without any intervention, the rate of vertical transmission of HIV is as much as 15-45%. National PPTCT program of India run by NACO (National AIDS Control Organization) aims at preventing HIV transmission from mother to child. Women who are known HIV positives or those who are diagnosed as HIV positive for the first-time during pregnancy, are given Triple Dose Anti Retro-viral therapy comprising of Tenofovir, Lamivudine and Efavirenz. Special precautions are taken during their delivery. Whether LSCS is to be performed depends on the indications and on which guidelines are followed. Infant-feeding is advised to be carried out as per the guidelines stated in the PPTCT act so as to minimize the chances of HIV transmission to the infant.

Keywords: HIV, Pregnancy, Vertical transmission PPTCT, Anti-retroviral therapy

INTRODUCTION

HIV (Human Immunodeficiency Virus) infection which is caused by the virus of the same name is a deadly disease that attacks the immune system of the body, leaving it susceptible to various dangerous infections which would have otherwise been combated. If left untreated, the condition progresses to Acquired Immunodeficiency Syndrome (AIDS) which is the End Stage of the HIV infection¹

A pregnant woman living with HIV can pass on the virus to her baby during pregnancy, childbirth and through breastfeeding. This is called Vertical transmission of HIV and has been a cause of considerable morbidity and mortality among infants. However, by early diagnosis, by exercising proper care measures in the antenatal, intrapartum and post-partum as also post-natal period and

taking antiretroviral treatment correctly, the risk of passing on the virus to the baby can be virtually eliminated.¹

There are 2 types of HIV infections: HIV-1 and HIV-2. HIV-1 has spread globally and it is the most common type of HIV with almost 95% of HIV affected individuals suffering from this type.² HIV-2 is mainly found in West Africa but it has started to appear in Europe, USA and India.³ Compared to HIV-1, transmission of HIV-2 virus from an infected mother to her child seems to be less frequent. However, cases of transmission from an infected woman to her fetus have been reported among women who had primary HIV-2 infection during their pregnancy.⁴

PROBLEM STATEMENT

As per World Health Organization (WHO) statistics almost 76 million people have been affected by the disease since the beginning of the epidemic. As of 2019 there were

38 million (31.6 million to 44.5 million) living HIV cases in the world.⁵ The rate of vertical transmission of HIV is as much as 15-45% without any intervention.

India has the third largest HIV epidemic in the world. In 2017 there were 2.1 million living cases of the disease in the country.⁶ The first case of HIV-1 was detected among sex workers in Chennai, India in 1986.⁷ The first evidence of HIV-2 infection in India was provided in 1991.⁸ The prevalence was slightly greater than two-fifths among females.⁹ The NACO (National AIDS Control Organization) Technical Estimate Report (2015) estimated that out of 29 million annual pregnancies in India, 35,255 occur in HIV positive pregnant women. In the absence of any intervention, an estimated (2015) cohort of 10,361 infected babies will be born annually.¹⁰

EFFECT

Effect of Pregnancy on HIV

Pregnancy in HIV positive women causes a further decrease in their immunity.^{11,12} Studies have shown that pregnancy has little effect on asymptomatic HIV positive

women.^{13,14} However its effect on effect on symptomatic cases has been controversial. Some studies have concluded that pregnancy does accelerate the pace of HIV whereas others have concluded that it does not.^{15,16} It has been found out by several studies that HIV affected pregnant women are much more likely to develop bacterial pneumonia compared to the non-pregnant ones.^{17,18,19}

Effect of HIV on pregnancy

The effects of HIV on the outcome of pregnancy are minimal.²⁰⁻²² However immunodeficiency could predispose to chorio-amnionitis with the associated risk of stillbirth and pre-term labor; the fetus could be damaged by recurrence of other infections such as cytomegalovirus or toxoplasmosis; and the effect of concurrent infections and poor nutritional status with advancing disease could impair the woman's ability to maintain her pregnancy successful.²³

TRANSMISSION²⁴⁻²⁸

NACO estimates the rates of vertical transmission in India to be as follows.²⁹

Table 1: Risk factors for HIV transmission.

Risk factor	Explanation	Strength of association	Impact
Maternal			
RNA virus load	Higher the viral load in mother, more the chances of transmission	Strong	Large
AIDS	If the HIV infection has progressed to AIDS, there are higher chances it will be transmitted	Strong	Small-medium
Genetic Factor	Innate resistance or susceptibility for vertical transmission maybe related to various genes present in either the mother	Strong	Medium
Presence of other conditions along with HIV	Conditions like- 1) Other Sexually transmitted infections 2) Chorioamnionitis 3) Vitamin A deficiency	Medium	Small
Obstetrics			
Mode of delivery	Traumatic or instrumental delivery increase the chances of HIV transmission	Strong	Large
Duration of membrane rupture	It has been found that prolonged membrane rupture has been (.4hours)	Strong	Large
RNA in vagina/cervix	More likely to transmit infection	Medium	Medium
Invasive procedures	Invasive procedures like Chorionic villus sampling or increase transmission	Strong	Small
Pediatric			
Prematurity	Due to various factors like lower immunity or	Strong	Strong
Breastfeeding	Breastfeeding or more importantly mixed feeding of breastmilk and complementary feeds increase the HIV risk	Strong	Large
Genetic	Just like maternal genetic factors, various infant risk factors increase or decrease the risk of transmission	Weak	Small

Table 2: Rates of HIV transmission during various phases of labour, delivery and lactation.

Risk factor of transmission	Rates (%)
During pregnancy	5-10
During labor and delivery	10-15
During breastfeeding	5-20
With breastfeeding to six months	20-35
With breastfeeding to 18-24 months	30-45

PREVENTION OF PREVENTION MATERNAL TO CHILD TRANSMISSION (PPTCT) PROGRAM

National PPTCT program of India recognizes 4 elements to prevent HIV transmission from mother to child.³⁰ These are-

Prong 1: Primary prevention of HIV (especially in women of childbearing age)

Prong 2: Prevent unintended pregnancy

Prong 3: Prevent transmission of HIV from the mother to their infant

Prong 4: Provide care, support and treatment to women living with HIV along with their families and children.

THE PPTCT Program, India

In an attempt to curb vertical transmission of HIV in India, The Prevention of Parent to Child Transmission of HIV/AIDS (PPTCT) program was launched in the country in the year 2002.²⁹ The goals of the PPTCT program are-

Primary prevention of HIV, especially among women in child-bearing age.

Integration of PPTCT interventions with general health services such as basic Ante-natal Care (ANC), Natal and Post -Natal Services, Sexual Reproductive Health and Family Planning, EID, Pediatric ART and Adolescent Reproductive and Sexual Health (ARSH), TB and STI/RTI services.

Strengthening post-natal care of the HIV-infected mother and her exposed infant.

Provide the essential package of PPTCT services.

Under this program various measures have been adopted for antenatal women, women during delivery, for infected women in their post-partum period and the exposed newborns.

ANTENATAL WOMEN

All women who visit the antenatal clinic are provided information about and offered the HIV screening test. After the test, post-test counselling is very important for negative tests to remain un-infected; while for those with confirmed HIV positive tests need to be given further

counselling, support and referrals to care and treatment services.³² Pregnant Women who opt-out of HIV testing should be offered repeat counselling to explore the reasons for opting out, address any misunderstandings and encourage her to reconsider her decision. These women should be offered routine HIV testing at each subsequent clinic visit.³² When a pregnant is diagnosed to be HIV positive, early registration of pregnancy (before 12 weeks) is to be done and at least 4 ANC (antenatal) checkups must be conducted during pregnancy. Screening for hemoglobin, urine analysis and blood group and type should be done. Also screening for syphilis, Hepatitis B and C, TB and sexually transmitted diseases is also done. This is followed by nutritional counselling and iron and folic acid supplementation.³²

Finally, an assessment of the clinical stage of HIV is assessed and screening for cervical cancer is done followed by providing counselling for adherence to treatment, institutional delivery and exclusive breastfeeding.³²

ANTIRETROVIRAL THERAPY (ART)

All the pregnant women diagnosed with HIV are started on TRIPLE DRUG ART (Tenofovir+ Lamivudine + Efavirenz) irrespective of their CD4 count and WHO clinical stage. As per NACO, in 2018, out of all the pregnant women diagnosed with HIV, 60% were taking ART.³²

Table 3: ART drugs with dose and side effect.

Name of the drug	Dose	Side-effects
Tenofovir	300 mg	Nephrotoxicity Hypo-phosphataemia
Lamivudine	300 mg	Hypersensitivity Pancreatitis (rare)
Efavirenz	600 mg	An array of neuropsychiatric symptoms

ART has been proven to provide several advantages like delaying disease progression, preventing severe opportunistic infections, reducing transmission rates of HIV and increasing the survival rate.³¹ A combination of 3 drugs is used for ART as it helps restore immunity, causes maximum viral suppression, prevents emergence of resistance and improves the overall quality of life.³³

INTRAPARTUM CARE

Precautions during labour

Various precautions that need to be taken during labor include conducting minimal vaginal examinations, giving ART to the mother, avoiding ARM and invasive fetal

monitoring and oxytocic drugs should be used for prevention of blood loss.³³

Episiotomy and prolonged traumatic delivery should be avoided as far as possible. If instrumental delivery is indicated, applying forceps should be preferred over ventouse. Early cord clamping should be done. All the Universal Safety Precautions should be followed while conducting the delivery.³³

Role of LSCS

Various studies and analyses have been conducted, so as to assess the role of elective Low Segment Caesarean section (LSCS) the deliveries of HIV positive women and to assess if they have an advantage over vaginal delivery.

In a European study, the HIV status of 370 infants born to HIV positive mothers was studied. 200 of the women had had a vaginal delivery and 170 of them had an LSCS. As per the results of the study, the rate of transmission in the former was 10.5% and the latter was 1.8%.³⁴ A meta-analysis of several North American and European studies showed that the rates of HIV transmission were reduced by as much as 50 percent in HIV positive in whom LSCS was conducted instead of a vaginal delivery.³⁵ In a meta-analysis of studies in middle- and low-income countries it was found that though LSCS increased the morbidity in HIV positive mothers, it was associated with a reduction in transmission rates with an Odd's ratio – 0.27 (95% CI – 0.16 to 0.45).³⁶

There are various guidelines by different organizations about whether elective LSCS must be carried out in HIV affected women.

Table 5: Guidelines for conducting elective LSCS in HIV positive patients.

NACO guidelines	LSCS only for obstetric indications
US guidelines	Scheduled Cesarean delivery at 38 weeks of gestation provided HIV RNA levels are >1000copies/ml or are unknown at the time of delivery. 36
BHIVA guidelines (2012)	Offer C-section to women not on ART and have viral load >400 copies/ml or higher. 37

The risk of transmission increases by 2% per hour after rupture of membranes There is no benefit of C-Section after 4 hours of delivery.³⁹

POSTPARTUM CARE

Neonatal (Anti-retroviral) ARV prophylaxis is given for 6 weeks, to infants born to HIV positive mothers, regardless of whether they are breastfed or not.⁴ A blind trial conducted in the African countries of South Africa,

Uganda, Zimbabwe and Tanzania among 1522 HIV negative infants, born to HIV positive mothers, it was found that transmission rates reduced by 76% in infants who received the prophylaxis.⁴⁰ Cotrimoxazole prophylaxis is given to infants from 6 weeks to 18 months of age (up to 5 years if they are HIV positive).⁴¹

Infant feeding

As per the PPTCT guidelines for breastfeeding, exclusive breast feeding should be done for at least 6 months, after which complementary feeding should introduced gradually, irrespective of whether the infant is diagnosed HIV negative or positive by early infant diagnosis. Also, either mother or infant should be receiving ARV prophylaxis or ART during the whole duration of breast feeding. ARV prophylaxis should continue for one week after the breast feeding has fully stopped.⁴² For breast feeding infants diagnosed HIV negative, breast feeding should be continued until 12 months of age, if the mother is on ART or ARV prophylaxis is being given to mother or infant. For infants diagnosed HIV positive, ART should be started and breast feeding should be continued till 2 years of age.⁴²

Breast feeding should stop once a nutritionally adequate and safe diet without breast-milk can be provided. Breast feeding should never be stopped abruptly. Mothers who decide to stop breast feeding should stop gradually over one month.⁴²

CONCLUSION

Thus, HIV is a potentially dangerous diseases that can have profound effects on pregnancy Women can pass on this disease to the fetus or child while they are pregnant or lactating. In order to reduce these rated the PPTCT program has been launched by NACO in India. Seropositive women are given Triple Dose Anti Retroviral therapy that comprises of Tenofovir, Lamivudine and Efavirenz. Also, special precautions adopted while conducting their delivery. Whether or not LSCS is to be performed depends on the indications and on which guidelines are followed. Finally, infant- feeding is advised to be carried out as per the guidelines stated in the PPTCT act so as to minimize the chances of HIV transmission to the infant. The introduction of these all these guidelines under the National PPTCT program has resulted in the rates of HIV transmission rates from mother to child reducing significantly

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