# Editorial

## Prevention of Mother to Child Transmission of HIV / AIDS Infection

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The problem of HIV infection is multifaceted and therefore, we need a multifaceted approach whenever services and programmes for prevention/management of HIV / AIDS are conceived. It is very necessary to adopt a holistic approach and work with other agencies.

Mother to Child Transmission (MTCT) is responsible for > 10% of the total new HIV infections each year in developing countries and there are more than 3 00,000 children infected every year.

The introduction of Antiretroviral (ARV) drugs for the prevention of MTCT and avoidance of breast feeding has reduced the rate of HIV transmission by almost 51% 67.5%.

**Transmission of HIV from mother to child:** MTCT rates vary from 14-42% which in the developed countries with the use of ARV drugs and elective caesarean section have been brought down to almost 9%. There is an additional risk of 7%-22% for breast fed infants.

**Factors affecting transmission:** There are several factor associated with higher riks of transmission.

**Viral factors:** A high maternal viral load (> 50 000 PCR copies per ml. at the time of delivery has been shown to transmit the virus. A high maternal viraemia may be due to advanced disease or it can happen at the time of seroconversion.

Viral genotype and phenotype may also be associated with higher transmission rate. Viral resistance is also another factor.

**Maternal factors: Included in this one are:**

- Advanced Immunosuppression (low CD4 or CD8 count)
- Advanced clinical disease
- High viral load
- Recent Infection.
- Nutritional status or Vit A deficiency
- Behavioural factors
- Placental barrier integrity (chorioamnionitis)

All the above factors are self explanatory.

**Obstetric factors:** These are very important as maximum transmission takes place around the time of labour and delivery. They include:

- Mode of delivery: vaginal vs caesarean section Delivery by C.S. has been shown to be protective in some prospective studies but not all.
- Prematurity is more a foetal factor.
- Prolonged rupture of membranes: In this the risk doubles after four hours.
- Intrapartum haemorrhage

- Invasive foetal monitoring.
- Instrumental deliveries.

**Foetal factors:** The commonest among these are:

- Prematurity: This may be due to immaturity of the immune system.
- Multiple pregnancy: Where the first born twin is at higher risk.
- Coinfection with other pathogens and poor nutrition.

**Breast feeding and infant factors:** In developing countries 1 in 7 children born to HIV infected mothers will be infected through breast milk. Late postnatal transmission after the age of three months has also been described and may be as high as 4-20%.

Other factors include gastrointestinal tract factors and an immature immune system.

**Strategies to reduce mother to child transmission:**

**Obstetric practices:** There are several Obstetric practices that can be modified or adopted for all women to reduce the risk of HIV infections in mothers and children.

**Termination of Pregnancy:** May be offered if the diagnosis has been made early enough in pregnancy. Many women choose to continue the pregnancy after counselling has provided all the information about transmission risks and prognosis to the mother/couple in a non judgemental way.

Modifications to routine Obstetric practices may be needed if a woman is known to be HIV positive or is diagnosed as being HIV positive during pregnancy.

**Antenatal care:** Besides routine antenatal care focus should be on HIV related symptoms and illnesses.

**Signs of opportunistic infections.**

Diagnosis and treatment of Sexually Transmitted Infections (STI). Communication and identification of an HIV positive woman at the antenatal clinic must be done in a way that respects the privacy and rights of the woman.

**Nutritional Support:** In addition to adequate diet, vit A and other micronutrient supplements may be necessary. Lifestyle and behaviour changes: HIV positive women should be counselled to avoid: Smoking, alcohol and drug use, unprotected sex and stress.

**Medical Treatment:**

**Anti Retroviral Drugs:** There is some concern regarding the use of ARVS in the first trimester of pregnancy. Zidovudine may be given alone or in combination. Long or short regimen may be used. Vit A and other micronutrient supplementation.

**Immunotheray.**

**Treatment of STI (Sexually Transmitted Infections)**

**Anti-Retroviral drugs:**

**Classification of the available antiretroviral drugs.**

Nucleoside Reverse Transcriptase Inhibitors:
Zidovudine (ZoV, AZT) Zalcitobine (ddc) Didanosine (ddi) Stavudine (d4T), Lamuvidine (3TC)
Non nucleoside – Reverse Transcriptase Inhibitors:
Nevirapine, Delavirdine
Protease Inhibitors:- Indinavir, Ritonavir, Saquinavir Nelfinavir.
Monotherapy: Long course Zidovudine (AC TG 076, 1994): 100mgms. orally five times a day from 14-34 weeks of pregnancy, 2mgm/kg/hr I.V. during labour for the 1 hour followed by 1mgm/kg/hr I.V. till delivery. Post partum 2mgm/kg/day syrup six hourly for six weeks given to the neonate has been shown to reduce the risk of MTCT by 67%.

**Short course Zidovudine:** The Bangkok study showed that Zidovudine given antenatally, 300mgm orally twice a day from 36 weeks, and 300mgm orally 3 hourly from the onset of labour to delivery would result in a 51% reduction in MTCT. Shorter drug regimens are more feasible in resource poor settings.

In both the above studies the women were provided with infant formula for feeding the infants.

**Nevirapine:** Given as one dose of 200mgm. orally to the mother at the onset of labour and one dose of 2mgm/kg to the child within 72 hours of birth was effective in reducing transmission by almost 50% according to the HIV NET 012 study in Uganda.

**Combination ARVS:**

In many developed countries the standard of care for AIDS treatment has become at least two nucleoside analogue reverse transcriptase inhibitors (, Zidovudine (ZDV, AZT) Lamivudine (3TC) Petrastud with the addition of a protease inhibitor like Nelfinavir or Saquinavir.

Pregnancy per se should not be a contraindication to the use of the most appropriate therapy.

Resistance to the use of antiretrovirals in pregnancy: Long term use of Zidovudine and Nevirapine are known to cause resistance. Resistance is less likely with a short protocol or with a combination of ARV therapy.

**Immune Therapy:** Both passive immunization with hyperimmune HIV immunoglobulin (HIVIG) and active immunization with HIV vaccines have been proposed as alternative mechanisms to prevent mother to child transmission.

**Vit A and other micronutrients:** Therapy has already been discussed.

**Obstetric Interventions include:**
Avoidance of Invasive tests,
Birth canal cleansing during labour Caesarean Section delivery

**Post partum care:** Should include counselling about infant feeding, family planning provision and support for the mother and family.

It is seen that proven strategies for preventing mother to child HIV Transmission include:

- Antiretroviral therapy
- Elective Caesarean section
- Replacement feeding of the infant
- An option of termination of pregnancy where it is legal
- Restricted use of invasive obstetric procedures.

**Strategies which may reduce MTCT include:**

- Micronutrient supplementation during pregnancy.
- Cleansing the birth canal with a microbicide during labour and delivery.
- Detection and treatment of STI's
- Antiretroviral treatment to children during breast feeding.

**Thus to prevent Mother to Child Transmission:**

Reduce the number of HIV positive pregnancies
Reduce the concentration of HIV in maternal fluids and tissues
Reduce exposure of fetus / infant to maternal fluids and tissues
Reduce chance of infection in infants exposed to HIV.
To implement the programme of prevention of Mother to Child transmission there are several phases. The three core phases are:-

Phase 1: Information eg. Voluntary testing and counselling.
Phase-2: Prophylactic treatment: eg: ARV to mother during pregnancy and labour
Phase-3: Care, providing feeding options etc.

Two additional phases which are there and are required include:
**Phase alpha:** Primary prevention of HIV in women of Child bearing age.
**Phase Omega:** Care and support of HIV affected children, women and families.

Thus as is seen there are several interventions available for preventing mother to child transmission. It is important to combine interventions working on different mechanisms at different times so that an additive effect may be achieved. The criteria for selecting a certain intervention package would depend on:

- Local need: HIV prevalence in the area.
- Whether conditions like access to PHC / MHC services exist.
- Availability of resources, capacity to ensure continuity of any service exist.
- Whether it is possible to work with provider providing synergestic services like VCT, FP etc.,
- Cost effectiveness of the intervention package.
- Affordability by Government, donors etc.

**Ethical issues:** The cost of continuing these drugs for a long duration is prohibitive. Several questions have been raised regarding the ethics of stopping antiretrovirals after delivery though the primary aim in giving these drugs is to prevent mother to child transmission.

Pregnancy is the time a large number of HIV positive women who may be unaware of their HIV status will be indentified.

Pregnancy does not have a major adverse effect on the natural history of HIV infection in women but adverse pregnancy outcomes that have been reported in HIV positive women include increased rates of spontaneous early abortion, low birth weight babies, stillbirths, preterm labour, preterm rupture of membranes, other sexually transmitted infections, bacterial pneumonias etc.,

The management of pregnancy in an HIV positive woman should be seen as part of long term care of the woman besides trying to reduce the transmission of HIV from mother to child.

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