PERINATAL HIV

AIIMS Protocols

Sunil Saharan*, Rakesh Lodha, Ramesh Agarwal, Ashok Deorari, Vinod Paul

*Junior Resident , Miami Children Hospital , Florida

Division of Neonatology, Department of Pediatrics

All India Institute of Medical Sciences

Ansari Nagar, New Delhi –110029

Address for correspondence:

Dr Ramesh Agarwal

Assistant Professor

Department of Pediatrics

All India Institute of Medical Sciences

Ansari Nagar, New Delhi 110029

Downloaded from www.newbornwhocc.org

Email: aranag@rediffmail.com

Abstract

HIV pandemic is one of the most serious health crises the world faces today. Approximately 5-10% of all cases infected by HIV are children. Majority of children acquire infection through mother-to-child transmission (MTCT) either during pregnancy, delivery, or by breast-feeding. MTCT can be reduced to <2% by use of antiretroviral drugs in women during pregnancy and labour and to the infant in the first 6 weeks of life combined with obstetrical interventions including elective caesarean delivery and avoidance of breastfeeding. Guidelines for postnatal diagnosis of HIV infection, feeding, immunization and administration of cotrimoxazole prophylaxis have been described in the protocol.

Keywords: HIV, pregnancy, perinatal, mother-child transmission, neonate

AIIMS Protocols

1. Introduction:

The human immunodeficiency virus (HIV) pandemic is one of the most serious health crises the world faces today. AIDS has killed more than 25 million people since 1981 and an estimated 33.4 (31.1-31.8) million people are now living with HIV, about 2.1 (1.2-2.9) million of whom are children (1). In 2008 alone, an estimated 430,000 children were newly infected with HIV with majority of transmission being perinatal. UNAIDS estimated that 200000 cumulative new HIV infections have been averted in the past 12 years by use of ART for prophylaxis in pregnant women (1). In India estimated 2.31 million (1.8-2.9) people are living with HIV infection as on year 2007. Adult prevalence of HIV infection in our country is 0.34% (0.25-0.43%) with prevalence of HIV in pregnant women being 0.48%. Out of the estimated number of people living with HIV/AIDS, 39% are females and 3.5% are children. (2).

2. Mode of transmission

Most children living with HIV acquire the infection through mother-to-child transmission (MTCT). HIV infection can be transmitted from an infected mother to her fetus during pregnancy, during delivery, or by breast-feeding. HIV can be transmitted to the fetus as early as the first and second trimester of pregnancy. However, maternal transmission to the fetus occurs most commonly in the perinatal period. Perinatal transmission is an extremely important mode of transmission of HIV infection in developing countries.

3. Risk factors for Perinatal HIV transmission (3)

- **Viral factors:** High viral load, non-syncytium inducing phenotype, HIV-1

AIIMS Protocols

- **Maternal factors:** Advanced disease (low CD4 count, symptoms of AIDS), primary infection of mother during pregnancy, first of twins, rupture of membranes more than four hrs, maternal bleeding, mother not on antiretroviral therapy, vaginal delivery, other sexually transmitted diseases, isolated HIV-1 infection
- **Fetoplacental factors:** chorioamnionitis, placenta previa, prematurity (increased peripartum transmission)
- **Infant factors:** HLA concordance with mother
- **Postnatal factors:** breast feeding, higher breast milk virus load, mastitis or maternal nipple lesions, maternal seroconversion during breastfeeding, infant having thrush at less than six month age (in breastfeeding infant)

4. Prevention of perinatal HIV

- In the absence of any intervention the risk of perinatal transmission is 15–30% in non-breastfeeding populations (4).
- Breastfeeding by an infected mother increases the risk by 5–20% to a total of 20–45% (5).
- The risk of MTCT can be reduced to under 2% by interventions that include antiretroviral (ARV) prophylaxis given to women during pregnancy and labour and to the infant in the first 6 weeks of life, obstetrical interventions including elective caesarean delivery (prior to the onset of labour and rupture of membranes), and complete avoidance of breastfeeding (6-8).

AIIMS Protocols

5. ARV regimens for treating pregnant women (9)

Refer to figure-1.

- For HIV-infected pregnant women in need of ART for their own health**,** ART should be administered irrespective of gestational age and continue throughout pregnancy, delivery and thereafter (recommended for all HIV-infected pregnant women with CD4 cell count $\leq$350 cells/mm^3, irrespective of WHO clinical staging; and for WHO clinical stage 3 or 4, irrespective of CD4 cell count)
- Recommended regimen for pregnant women with indication for ART is combination of zidovudine (AZT), lamivudine (3TC) and nevirapine (NVP) or efavirenz (EFV) in antepartum, intrapartum and postpartum period; EFV-based regimens should not be newly-initiated during the first trimester of pregnancy.
- Recommended regimen for pregnant women who are not eligible for ART, but for preventing MTCT is to start ART as early as 14 weeks gestation or as soon as possible when women present late in pregnancy, in labour or at delivery. Two options for ART are available:
  - Option A: daily AZT in antepartum period, combination of single dose of NVP at onset of labour and dose of AZT and 3TC during labour followed by combination of AZT and 3TC for 7 days in postpartum period.
  - Option B: consists of triple ARV drugs starting as early as 14 weeks of gestation until one week after all exposure to breast

AIIMS Protocols

milk has ended (AZT + 3TC + LPV or AZT + 3TC + ABC or AZT + 3TC + EFV); [ABC= abacavir].

- Omission of the Single dose-NVP and AZT+3TC intra and postpartum may be considered for women who receive at least four weeks of AZT before delivery.
- If a woman received a three-drug regimen during pregnancy, a continued regimen of triple therapy is recommended for mother through the end of the breastfeeding period.

6. ARV regimens for infants born to HIV infected mothers (9)

- For breastfeeding infants: daily NVP from birth until 6 weeks of age or until one week after all exposure to breast milk has ended. The dose of nevirapine is 10 mg/ d for infants $\leq$ 2.5 kg; 15 mg/ d for infants more than 2.5 kg
- For non-breastfeeding infants: daily AZT or daily NVP from birth until 6 weeks of age. The dose of zidovudine is 4 mg/ kg twice a day.

7. Intrapartum interventions

- Avoid rupture of membranes unless medically indicated.
- Delivery by elective caesarean section at 38 weeks before onset of labour and rupture of membranes.
- Avoid procedures increasing risk of exposure of child to maternal blood and secretions like use of scalp electrodes.

8. Breast feeding

AIIMS Protocols

- Breast-feeding is an important mode of transmission of HIV infection in developing countries. The risk of HIV infection via breast-feeding is highest in the early months of breast-feeding (10). Exclusive breast-feeding has been reported to carry a lower risk of HIV transmission than mixed feeding.
- Factors that increase the likelihood of transmission include detectable levels of HIV in breast milk, the presence of mastitis and low maternal CD4+ T cell count.
- Mothers known to be HIV-infected should only give commercial infant formula milk as a replacement feed when specific conditions are met (referred to as AFASS – affordable, feasible, acceptable, sustainable and safe in the 2006 WHO recommendations on HIV and Infant Feeding)(11)
    - Mother, or other caregiver can reliably provide sufficient infant formula milk to support normal growth and development of the infant.
    - Mother or caregiver can prepare it cleanly and frequently enough so that it is safe and carries a low risk of diarrhea and malnutrition.
    - Mother or caregiver can, in the first six months, exclusively give infant formula milk.
    - Family is supportive of this practice.
    - Mother or caregiver can access health care that offers comprehensive child health services.

AIIMS Protocols

- Mothers known to be HIV-infected may consider expressing and heat-treating breast milk as an interim feeding strategy in special circumstances such as:
  - Low birth weight or is otherwise ill in the neonatal period and unable to breastfeed
  - Mother is unwell and temporarily unable to breastfeed
  - Temporary breast health problem such as mastitis
  - To assist mothers to stop breastfeeding
  - If antiretroviral drugs are temporarily not available
- Replacement feeding should be given by katori spoon; bottle feeds should be avoided.
- If replacement feeding is not feasible, mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life. Breastfeeding should then stop once a nutritionally adequate and safe diet without breast milk can be provided.
- Breastfeeding should stop gradually in one month.

AIIMS Protocols

9. Postnatal Diagnosis of HIV Infection (12)

Refer to figure-2

- In children younger than 18 months diagnosis of HIV infection is based on: a positive virological test at 6 weeks for HIV or its components (usually by HIV-DNA PCR). The diagnosis should be confirmed by a

second test on a separate sample shuold be repeated at the earliest (12).

- If an infant or child is breastfeeding, he or she remains at risk of acquiring HIV infection throughout the breastfeeding period. Virological assays to detect HIV infection should be conducted at least six weeks or more after the complete cessation of breastfeeding to rule out HIV infection.
- Positive antibody testing is not recommended for definitive or confirmatory diagnosis of HIV infection in children until 18 months of age (13).

10. Co-trimoxazole prophylaxis

- Co-trimoxazole prophylaxis is recommended for all HIV-exposed infants under age 18 months starting at 4–6 weeks of age or when first seen and continued until HIV infection can be excluded (14).
- Co-trimoxazole prophylaxis is also recommended for a breastfeeding child of any age, continued until HIV infection can be excluded following cessation of breastfeeding, with testing performed six weeks or more after breastfeeding was stopped.
- In children < 6 month dose is 2.5 mL once a day (trimethoprim 40 mg & sulphamethoxazole 200 mg/ 5 mL)

11. **Immunization** (15)

- HIV exposed or infected but asymptomatic children should receive all standard vaccines as per national schedule.

AIIMS Protocols

- HIV infected children with immune suppression or symptoms should receive all standard vaccines except BCG, OPV, and varicella vaccines.
- Consider HiB and pneumococcal vaccines in all HIV exposed children (irrespective of symptoms or CD4 count).

References

1. UNAIDS/WHO. AIDS Epidemic Update. December, 2009.

2. National AIDS Control Organization. HIV Sentinel Surveillance and HIV estimation in India 2007. Available at: http://nacoonline.org/upload/Publication/M&E%20Surveillance,%20Research/HIV%20Sentinel%20Surveillance%20and%20HIV%20Estimation%202007_A%20Technical%20Brief.pdf (accessed on 25/1/2010).

3. Havens P, Waters D. Management of the infant born to a mother with HIV infection. Pediatr Clin North Am 2004; 51: 909-937.

4. The Working Group on Mother-to-Child HIV. Transmission of, Rates of mother-to child transmission of HIV-1 in Africa, America, and Europe: results from 13 perinatal studies. J Acquir Immune Defic Syndr 1995; 8:506–10.

5. De Cock KM, Fowler MG, Mercier E, et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. JAMA 2000; 283:1175-82.

6. Lallemant M, Jourdain G, Le Coeur S, et al. Single-dose perinatal nevirapine plus standard zidovudine to prevent mother-to-child transmission of HIV-1 in Thailand. N Engl J Med 2004; 351:217-28.

7. Thorne C, Patel D, Fiore S, Peckham C, Newell ML. Mother-to-child transmission of HIV infection in the era of highly active antiretroviral therapy. Clinical Infectious Diseases 2005; 40:458–465.

8. Magoni M, Bassani L, Okong P et al. Mode of infant feeding and HIV infection in children in a program for prevention of mother-to-child transmission in Uganda. AIDS 2005; 19:433-7.

9. WHO. Rapid advice: Use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants. November 2009.

AIIMS Protocols

10. Dunn DT, Tess BH, Rodrigues LC, Ades AE. Mother-to-child transmission of HIV: implications of variation in maternal infectivity. AIDS 1998; 12:2211-6.

11. WHO. Rapid advice: Revised WHO principles and recommendations on infant feeding in the context of HIV. November 2009.

12. WHO. Antiretroviral therapy of HIV infection in infants and children: towards universal access 2010.

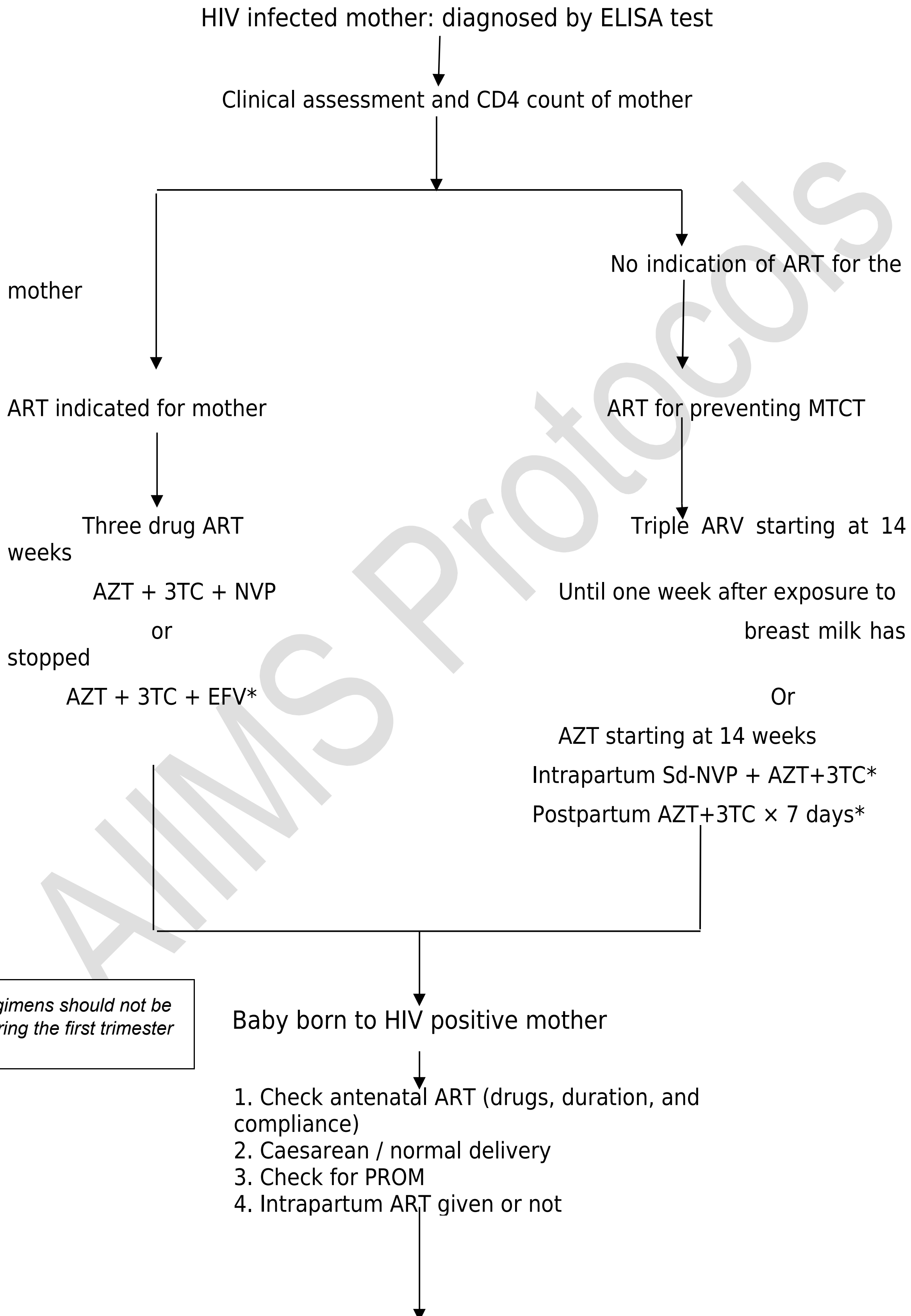
13. Chantry CJ, Cooper ER, Pelton SI, Zorilla C, Hillyer GV, Diaz C. Seroreversion in human immunodeficiency virus-exposed but uninfected infants. Pediatr Infect Dis J 1995; 14:382-7.

14. WHO. Guidelines on co-trimoxazole prophylaxis for HIV-related infections among children, adolescents and adults in resource-limited settings recommendations for a public health approach. 2006.

15. Anonymous. Immunization in special circumstances. In, Shah RC, Shah NK, Kukreja S (Eds). IAP Guide Book on Immunization, Mumbai; IAP Committee on Immunization, 2005-2006; 52-54.

AIIMS Protocols

Figure 1 Protocol on approach to a baby born to HIV infected mother[8]



AIIMS Protocols

Infant: NVP for 6 wk or AZT for 6 wk

* Sd-NVP and AZT+3TC intra- and post-partum can be omitted if mother receives more than 4 weeks of AZT during pregnancy

Note:

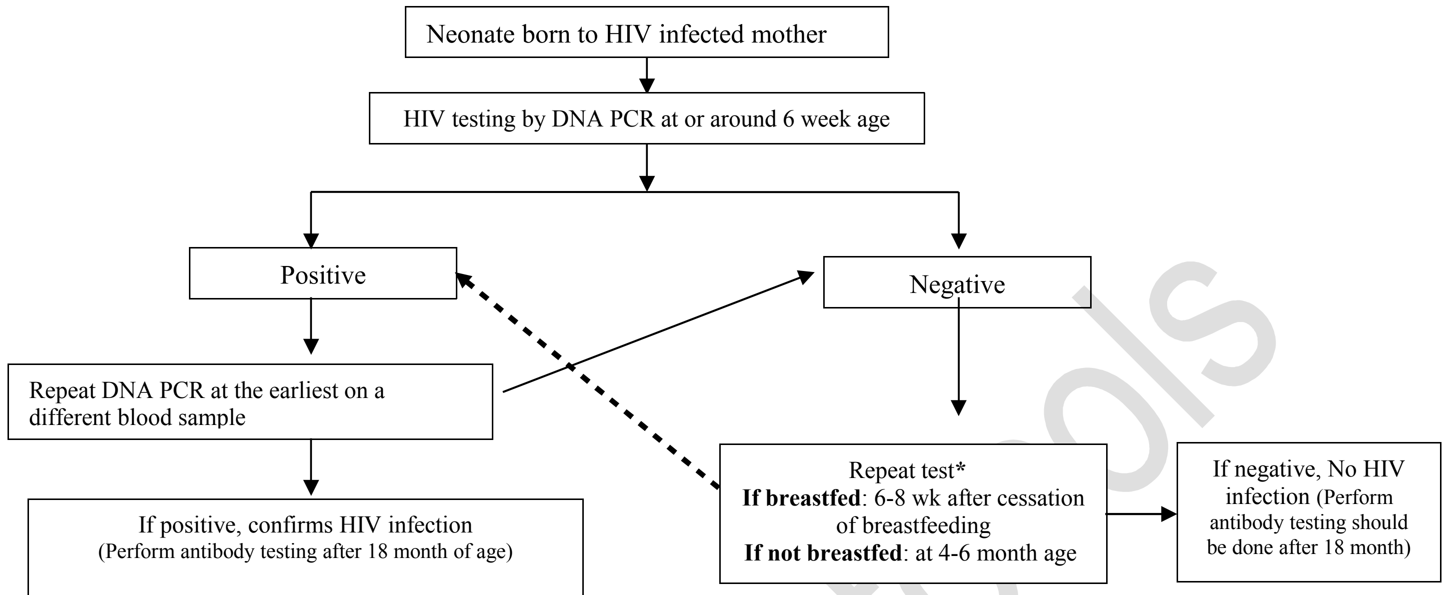
- *For breastfeeding infants: daily NVP from birth until 6 weeks of age or until one week after all exposure to breast milk has ended*

Abbreviations:

ART	-	Antiretroviral therapy
AZT	-	Zidovudine (4 mg/kg twice a day for the infant)
Sd NVP	-	Single dose nevirapine
3TC	-	Lamivudine
NVP	-	Nevirapine (10 mg/ d for infants $\leq$ 2.5 kg; 15 mg/ d for infants more than 2.5 kg)
EFV	-	Efavirenz

AIIMS Protocols

Figure 2 Diagnostic approach for HIV exposed infants[11]



- Test may also need to be repeated in infants who develop symptoms or signs suggestive of HIV infection.

AIIMS Protocols