

Original Research Article

Maternal and fetal outcomes in HIV positive pregnant female

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ABSTRACT

Background: Vertical Transmission is still not an uncommon mode of HIV transmission. HIV and its treatment can also affect maternal and fetal outcomes. We aimed to study incidence and factors of MTCT and maternal and fetal outcomes with the current standard of care.

Methods: It was an observational study, at BRD medical college Gorakhpur. Pregnant, HIV positive females consenting for the study were enrolled. Follow up was up to 6 months post-delivery. Infant testing for transmission was done at 6 months.

Results: A total 35 HIV positive pregnant female were studied. Follow up could be completed in only 29 patients. Four (13.79%) infants had HIV DNA detectable in whole blood at 6 months. Transmission was 16.6% in group taking ART for <3 month as compared to 11.7% in group taking ART for >3 months, 25% in mixed feeding group vs. 12% in exclusive breast feeding and 16.6% in NVD group vs. 9% in LSCS. Incidence of Preterm delivery was higher in group who took ART for longer duration. IUGR was present in 10/29 (27%) and growth failure in 12/29 (41%) infants.

Conclusions: Longer ART duration and cesarean section delivery were more effective in preventing MTCT. Even exclusive breast feeding could result in MTCT. HIV exposure in utero may lead to IUGR. ART has no deleterious or positive effect on fetal growth but may be associated with preterm delivery. Better patient education will probably lead to earlier diagnosis and initiation of therapy to prevent transmission, and also to better fetal and infant outcomes.

Keywords: ART, IUGR, LSCS, MTCT, NVD

INTRODUCTION

Mother to child transmission (MTCT) is not an uncommon mode of HIV transmission, especially in resource poor countries. The transmission of HIV from HIV-positive mother to her child during pregnancy, labour, delivery or breastfeeding is called mother-to-child transmission.

According to current NACO guidelines pregnant women who are found HIV positive, should have immediate and lifelong ART to treat HIV and improve her own health, maximally suppress maternal viral load prior to conception to decrease the risk of perinatal transmission

and of HIV transmission to an uninfected partner.¹ Sexual partners should be encouraged to receive counseling and HIV testing and, if infected, to seek appropriate HIV care.

Although antiretroviral medications have the potential to improve health and extend the life of HIV-infected women, they may also result in unwanted adverse effects that may also compromise successful pregnancy and delivery. HIV infection itself has been associated with varying rates of adverse pregnancy outcomes such as increased spontaneous abortions, stillbirths, perinatal and infant mortality, intrauterine growth restriction, low birth weights and chorioamnionitis.^{2,3}

Goals of pre-conceptional counseling are to improve the health of the women before conception and to identify the risk factors for adverse maternal and fetal outcome. In the absence of any interventions transmission rates of MTCT range from 15-45%. This rate can be reduced to levels below 5% with effective interventions.

In order to reduce perinatal transmission, all pregnant women should have access to voluntary HIV testing and counseling. Delays in accessing antenatal care and low levels of education are the most significant patient risk factors associated with MTCT. Other factors like high viral load, advance age, any bad habit during pregnancy (smoking and alcohol), and premature delivery, breast feeding or mixed feeding are also responsible for MTCT.

Our hospital has been running an ART centre which has over 3500 patients on follow up; moreover it is also routine to have voluntary HIV testing in all pregnant females at the first hospital visit. We planned to study the incidence and factors affecting MTCT in all HIV positive pregnant patients undergoing a hospital delivery.

METHODS

The study was done over a period of one year from August 2014-2015, after approval by the institutional ethical committee. All pregnant females who were HIV positive and consented for the study, were enrolled and maternal and infant follow up was up to 6 months post-delivery. All patients were provided care as per standard NACO protocols and exclusive breast feeding was encouraged in all.

Maternal CD4 count was done at the time of delivery and whole blood DNA PCR was done in infant at 6 months. Maternal CD4 was done by FACS count method. Whole blood of infant collected under aseptic condition and stored at deep freezer (at -80 degree Celsius) and investigated for DNA PCR.

Developmental delay of infant assessed by WHO growth chart by using weight for height, height for age. Standard protocols laid down by NACO were followed for both mother and child.

RESULTS

There were 35 HIV positive pregnant female who were included in the study. Most of the patients (82.8%) were between age group 20-30 years. Most of the females (65.7%) were literate. There were 14 patients who were HIV positive and were on anti-retroviral therapy pre conception, 13 were detected to be HIV positive at ante natal screening and 8 patients who were detected to be positive at the onset of labour, which was their first hospital visit. There were a total of 35 live births, follow up could be completed in only 29 patients and these are included in further analysis. There were 4 infants in

whom HIV DNA was detectable in whole blood at 6 months. The incidence of MTCT was 13.79%.

Table 1: Duration of antiretroviral therapy and risk of transmission.

Mean duration of ART	No of cases	No of positive cases	No of negative cases
<3 month	12	2	10
≥3month	17	2	15

Odds ratio- 1.5000, 95% CI- 0.1806 to 12.4598

The various factors that were analyzed as risk factors for MTCT were; duration of antiretroviral therapy, mode of delivery, maternal CD 4 count at delivery and feeding practices. These are analyzed in Table 1-5.

Table 2: Duration of art and maternal outcome.

Duration of ART	No of cases	Pre term delivery	Full term delivery
Pre-pregnancy	11	2	9
During pregnancy	18	0	18

HAART associated with increased risk of preterm delivery

Table 3: CD 4 value and risk of transmission.

CD4 count of pregnant female (µl)	No of pregnant females	no of positive children	No of negative children
≤ 350	9	1	8
>350	20	3	17
Total	29	4	25

Odds ratio- 0.7083, 95% CI- 0.0634 to 7.9197

Table 4: Feeding practice and risk of transmission.

Feeding practice	No of children	No of positive children	No of negative children
Exclusive breast feeding	25	3	22
Mixed feeding	4	1	3
Total	29	4	25

Odds ratio- 0.4091, 95% CI- 0.0315 to 5.3164

Table 5: Mode of delivery and risk of transmission.

Mode of delivery	No of cases	No of positive cases	No of negative cases
NVD	18	3	15
LSCS	11	1	10
Total	29	4	25

Odds ratio- 2.0000, 95% CI- 0.1813 to 22.057

The Mean birth weight of the 35 children born to HIV positive mothers was 2.64kg.

On follow up, although there was no delay in the milestones achieved, but 12 out of 29 infant had poor weight gain at 6 month. This was unrelated to the HIV status of the infant, the CD4 count of the mother, nor to the socioeconomic status and educational status of the mother.

DISCUSSION

The Incidence of MTCT in our study was 13.79%. This is in contrast to the low rates reported with effective interventions. In the absence of any interventions transmission rates of MTCT range from 15-45%. Interventions not only include drug therapy but a comprehensive package including patient education and counseling as well. For the interventions to be effective, they should also be acceptable to the patient. Although there were a small number of patients in our study, and standard treatment protocols were followed yet the transmission rates were high. These may be due to various factors.

HAART for mothers effectively reduces the risk of infant HIV infection.⁴ The effectiveness in preventing MTCT is related to suppressed viral loads.⁵ This would require ART for at least 6 months duration. In present study we found that when standard triple ART regimen (Tenofovir, Lamivudine, Efavirenz) is given for at least 3 month before delivery chances of mother to child transmission is low (11.7%) as compared to when standard ART is started late in pregnancy, or at the time of delivery (16.6%). Two of the 7 females who took ART at the time of labour had MTCT. Although we do not have the viral load, the CD4 count of one of the patient was less than 200 suggesting need to initiate ART for mothers to prevent MTCT.

In present study 25 children were on exclusive breast feeding, 3 of them were detected to be HIV positive at 6 month, while of the 4 children who were on mixed feeding, 1 became HIV positive. Exclusive breast feeding has a low rate of transmission because HIV is not secreted in breast milk. Transmission is because of local anatomical abnormalities or mixed feeding. The mothers were enquired regarding local abnormalities and mixed feeding practices but both were denied by them. We were not able to do 6 week HIV detection of infant and hence cannot refute the chances of an intrapartum transmission in these infants. The timing of MTCT has always been a matter of debate, being most common during the period of breast feeding. Again, though the numbers are too small to be statistically significant, the rate of transmission was 25% in mixed feeding. The higher incidence of HIV transmission with mixed feeding has been shown in various other studies and hence either exclusive breast feeding with precautions of exclusive top feeding is recommended.⁶

Breast feeding is a major post-partum risk of HIV transmission. Risk is 14% from mothers with established

HIV infection and 29% from mothers who acquire HIV after birth. Late postnatal transmission, therefore, could contribute as much as 42% to the overall rate of MTCT.⁷ Although breastfeeding approximately doubles the risk of mother-to-child transmission, in resource poor country breast feeding is essential for the growth of the infant.

Normal vaginal delivery is associated with higher rate (16.6%) of transmission as compare to LSCS (9%). According to NACO 2013, Caesarean sections are not recommended for prevention of mother-to-child transmission, particularly where women are taking ART for their own health, C-section should be performed for obstetric indications only. But elective cesarean section had decreased rates of HIV transmission as compare to other modes of delivery.⁸

HAART is associated with reduction in mother to child transmission but with an increased risk of preterm delivery.⁹ In present study, as already discussed, chances of mother to child transmission was less in group taking HAART during pregnancy but the incidence of pre-term delivery was significantly higher, although the CI of the OR was very wide. Maternal viral load, CD4 count and symptomatic disease have been associated with preterm birth.^{10,11} No such correlation could be found in present study.

In present study the number of SGA babies was higher in group who were taking ART for a shorter duration pre delivery (<6 months). This is in contrast to the previous reported literature where ART has been shown to be associated with SGA. This percentage of SGA infant is also higher than the incidence of SGA infants in the general population. A high rate of IUGR has been observed among HIV pregnancies, probably due to placental insufficiency.¹²

HIV infection in mother itself can cause IUGR.¹³ SGA babies are at a higher risk for peripartum HIV transmission but in our study all four babies who found HIV positive, had birth weight ≥ 2.5 kg, hence further research is needed to study the mechanism of transmission in relation to birth weight.

HIV exposure in utero, even without subsequent transmission of the infection may also affect growth in infancy and early childhood.¹⁴ Factors attributed to developmental delays are not only due to maternal HIV infection but it is multifactorial, like maternal malnutrition, maternal (smoking, and alcohol use), and socio-economic condition (maternal education, socio-economic status). Of the 12 infants who had poor weight gain and growth failure, all belonged to poor socioeconomic status and 75% mothers were illiterate. It has been shown that women with higher education were significantly more likely to attend prenatal care visit.¹⁵ These potential determinants of poor growth other than HIV infection in mother have to be evaluated more precisely.

Factors like duration of ART, mode of delivery, feeding practices were studied in this observational study. We found that a longer ART duration and cesarean section delivery were effective in preventing MTCT. Even though the ART programs and maternal and child health schemes have been continuing for past many years, yet still a significant number (50% in present study) do not avail these services. Much more is needed in terms of patient awareness and acceptance of these schemes. Although normal vaginal delivery without any manipulation and instrumentation is recommended by NACO, the incidence of MTCT with NVD has been found to be higher in our study and other studies as well.¹⁶ Where facilities for a safe caesarean section are available, these guidelines should be relooked into.

CONCLUSION

Though present sample size was small to be of statistical significance, our results suggest that better patient education will probably lead to earlier diagnosis and initiation of therapy to prevent transmission. In patients who are on ART education and counseling can also lead to better fetal and infant outcomes.

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