



TRANSMISSION OF HIV IN EXCLUSIVELY BREASTFED BABIES OF HIV POSITIVE MOTHERS RECEIVING ANTIRETROVIRAL THERAPY

Pediatrics

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ABSTRACT

Aim: To evaluate HIV transmission in exclusively breastfed babies along with the ARV drugs.

Material and method: The present study was conducted among 30 pairs of mother and infant in the Department of Pediatrics, University College of Medical Sciences and associated Guru TegBahadur Hospital, a tertiary care centre in Delhi. CD4 cell count and viral load using RT PCR was done at the time of presentation in all these unbooked HIV positive mothers. These mothers were started on triple drug ART at the time of delivery. Follow up visits were done at 6, 10, 14 weeks and 7.5 months of age to ensure drugs and feeding compliance.

Results: Mean + SD of CD4 cell count at the time of delivery of mothers who were on ART was 404 ± 189.62 and of those in ARV group was 507 ± 120.16 with statistically insignificant difference. The overall risk of HIV transmission (ante, intra and postpartum) in babies born to HIV positive mothers at 6 weeks of age was 30% (9/30). At the end of study, overall HIV transmission rate in infants born to HIV infected mother was 36.7% (11/30).

Conclusion: Triple drug antiretroviral therapy is effective in reducing transmission of HIV through breastfeeding in unbooked mothers even when started at the time of the delivery.

KEYWORDS

HIV, Infant, Transmission, Antiretroviral Therapy

INTRODUCTION:

AIDS is a condition in human in which the immune system begins to fall leading to life threatening opportunistic infections¹. According to UNAIDS and WHO 33.4 million people are living with HIV infection of whom 2.1 million are children under 15 years of age. Besides 430,000 new pediatric infection occurred in 2008². The estimated risk and timing of mother to child transmission (MTCT) in the absence of intervention (as per NACO guidelines 2006) during pregnancy is 5 to 10%, during labour and delivery is 10 to 15%, during breastfeeding is 5 to 20%, overall without breastfeeding is 15 to 25%, overall with breastfeeding up to 6 months is 20 to 35% and overall with breastfeeding up to 18 months is 30 to 45%³.

So breast feeding carries a large amount of risk of HIV-1 transmission. It can be prevented if feeding pattern fulfils the AFASS (acceptable, feasible, affordable, safe, sustainable) criteria. In order to reduce the risk of HIV transmission through breastfeeds, there has been recently a novel approach of administration of antiretroviral (ARV) drugs to mother as well as to the child until the continuation of breastfeeding period^{4,5}. The abovementioned approach has been used mainly in African countries with gratifying results^{6,7}.

The transmission of HIV virus from mother to child can be reduced upto 1.1% by giving ARV prophylaxis during breastfeeding period⁸. Keeping in mind the implementation of this policy in resource poor country like India, present pilot study has been planned to look for HIV transmission in exclusively breastfed babies along with the ARV drugs.

MATERIAL AND METHOD:

This observational case series was conducted in anti-retroviral clinic of department of pediatrics and department of obstetrics & gynaecology of a tertiary care teaching hospital between November 2010 and April 2012. All unbooked mothers who were detected positive for HIV when they reached our hospital for delivery and their babies were enrolled in the study. Babies born with birth weight of less than 1 kg, less than 32 weeks and those born with gross congenital anomalies were excluded. Written informed consent was taken from the parents and ethical

clearance was taken from the institutional ethical committee. During study period of 18 months, 30 pairs of mother and infant were enrolled. Infant's recruitment was done at birth.

Treatment protocol:

CD4 cell count and viral load using RT PCR was done at the time of presentation in all these unbooked HIV positive mothers. These mothers were started on triple drug ART at the time of delivery, along with Nevirapine (NVP) in doses of 2 mg/kg/day for six weeks along with exclusive breastfeeding to the baby. These mothers were also counseled for exclusive breastfeeding for 6 months. Those who were not willing to breast feed were given replacement feed.

Follow up: Follow up visits were done at 6, 10, 14 weeks and 7.5 months of age to ensure drugs and feeding compliance. All the babies were subjected to DNA PCR test at 6 weeks of age. Test was repeated in infants, who were detected positive once, before labeling them positive. ART was started in DNA PCR positive infants. A repeat DNA PCR was done in negative babies, 6 weeks after cessation of breastfeeding in breastfed babies. RT-PCR was again done 6 weeks after cessation of exclusive breast feeding.

Statistical analysis:

Statistical analysis was performed by SPSS version 24 (IBM, Armonk, NY, USA) for data storage, tabulation, and the generation of descriptive and inferential statistics.

RESULTS:

Out of the 30 mothers, 19 mothers were put on ART, 7 on ARV and 4 on SdNVP. Out of 19 mothers on ART, 15 chose to exclusive breastfeeding and 4 mothers put their babies on top milk which was powdered milk. All 7 mothers from ARV group and 4 from SdNVP group chose exclusive breastfeeding for their babies. Mean + SD of CD4 cell count at the time of delivery of mothers who were on ART was 404 ± 189.62 and of those in ARV group was 507 ± 120.16 . This difference was not statistically significant ($p=0.195$) as shown in table 1.

The overall risk of HIV transmission (ante, intra and postpartum) in

babies born to HIV positive mothers at 6 weeks of age was 30% (9/30). At the end of study, overall HIV transmission rate in infants born to HIV infected mother was 36.7% (11/30). Mothers who chose EBF with ARV prophylaxis showed lesser transmission rate than mothers who chose EBF and received only single dose of nevirapine (14.3% v/s 25%). Mothers who were on ART and chose EBF had highest transmission rate of 53.3% in the present study. Transmission rate at the end of the study in infants who received exclusive breastfeeding was higher than infants who received top feeding. But this difference was also not statistically significant (table 2).

None of the mothers receiving ART had any drug related side effect like drugs induce rashes and hepatotoxicity. Two out of 7 mothers from ARV group complained of nausea, which is a known side effect of EFV.

DISCUSSION:

The success and availability of ARV drugs intervention that effectively reduced in utero and intra-partum transmission of HIV has shifted the focus of clinical research to identify the intervention that will reduce post-natal transmission of HIV through breast milk. One of the valid approach is to provide antiretroviral therapy to mother who is breast feeding or to infant for period of breastfeeding, or both¹.

Our study did not show any difference in the transmission rate in infants at 6 weeks of age whether they were delivered through lower segment caesarean section or vaginal route. This finding was contradictory to previous study which was conducted by Kind et al² in 1998 which showed that LSCS was effective intervention to reduce in mother to child transmission of HIV. Our study finding may be due to late presentation of mothers in labour stage where LSCS was an emergency procedure not an elective procedure and infants had exposed to maternal genital fluid.

In our study the transmission at 6 weeks of age was 30% (9/30). This transmission rate is very high. Nine out of 19 mothers in ART group had CD4 cell count less than 350 cell/mm³ and seven out of 30 mothers had viral load more than 10,000 RNA copies /ml. These mothers were in advance stage of disease at the time of delivery.

In our study, HIV transmission rate in EBF babies of HIV infected mothers receiving antiretroviral therapy at 6 weeks of age was 36.4% (8/22). This transmission rate was very high in comparison to previous studies which have shown the transmission rate at 6 weeks of age was between 0.7 to 5.5%. In Dream study, which was conducted by Marazziet al¹⁰ in 2007 showed the transmission rate at 6 weeks of age in infants, whose mothers received antiretroviral drugs from 25 weeks of gestation to 6 months of breastfeeding period, was only 1.2%. HIV Transmission rate in breastfeeding infants at 6 weeks of age was 4.2% in Kibs¹¹ and 3.3% in Kesho study¹². In these studies mothers were receiving triple antiretroviral prophylaxis during breast feeding period.

In our study, 6 weeks high transmission rate may be due to various factors which increase the in utero and intra-partum transmission like advanced stage of disease in mothers, higher viral load at the time of delivery, rupture of membrane more than 4 hour before delivery, sexual transmitted disease in mothers, chorioamnionitis, and invasive delivery procedure that increase contact baby with mothers infected blood or body fluid (Episiotomy)¹³.

CONCLUSION:

Triple drug antiretroviral therapy is effective in reducing transmission of HIV through breastfeeding in unbooked mothers even when started at the time of the delivery.

Table 1: CD4 cell count of mothers at the time of delivery

Patients	Cd4 cell count at delivery Mean ± SD
ART (19)	404±189.62
ARV (07)	507 ± 120.16
SdNVP (04)	684 ± 152.24

Table 2: HIV Transmission Rate at 6 weeks of age and end of study

Interval	Total cases (N=30)	ART+E BF (N=15)	ARV+E BF (N=7)	ART+Top feeding (N=4)	EBF+SdN VP (N=4)
6 Weeks of Age					
Positive	9	7	1	1	0
Percentage	30%	46.7%	14.3%	25%	0

End of Study					
Positive	11	8	1	1	1
Percentage	36.7%	53.3%	14.3%	25%	14.3%

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