

ORIGINAL ARTICLE

EVALUATION OF MOTHER TO CHILD TRANSMISSION OF HIV IN A TERTIARY CARE CENTRE

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ABSTRACT

Introduction: It is estimated that 22000-61000 of pregnant women living with HIV in India have mother to child transmission (MTCT) rate of 12-97%. This study was done to evaluate transmission rate of HIV from mother to child in a tertiary care hospital and evaluate role of different interventions.

Methodology: In this study all babies of HIV positive mothers who were diagnosed antenatal and also babies less than 18 months of age of HIV positive mother who came to paediatric OPD were enrolled. Informed consent was taken and assurance about secrecy was given. Detailed background information, antenatal history, obstetric history, birth history, mother investigation and treatment history were recorded. Single dose nevirapin was given to all mother and baby pairs. All babies were followed up to 18 months of age. Sero diagnoses of all babies were checked at different ages with different diagnostic tests and confirmed at the end of 18 months of age with 3 rapid diagnostic tests.

Result and Conclusion – Mother to child transmission rate was 11.4% in this study. Single dose nevirapin to mother baby pair had 93-97% protectivity. Anti retroviral treatment was 80-83% protective in mother with low CD4 count and high viral load. Due to limitation of sources breast feeding was still adopted as acceptable feeding option.

Keywords: HIV, Mother to child transmission, single dose nevirapin.

Acronyms

ART- antiretroviral treatment
ARVs- antiretroviral prophylaxis
CTX- co-trimoxazole prophylaxis
EID- early infant diagnosis
MTCT- mother to child transmission
PMTCT- prevention of mother to child transmission
SDNVP- single dose nevirapine

INTRODUCTION

Approximately half of the 33.4 million persons living with the human immune deficiency virus (HIV) worldwide are women of reproductive age and among the 2.1 million HIV infected children virtually all were infected during pregnancy, delivery or breast feeding. ¹Transmission of HIV from HIV positive mother to child during pregnancy, labour, delivery, breast feeding is called mother to child transmission (MTCT). MTCT is 15-45% without any intervention which can be decreased to 5% with interventions. Since 2002 the number of newly infected children has declined, probably owing to increased implementation of interventions for the prevention of mother to child transmission (PMTCT) of HIV and global stabilisation of HIV prevalence among the women. ² In 2008 almost half of the HIV infected pregnant women received anti

retroviral treatment (ART) for PMTCT. ¹ In most cases the simplest intervention, single dose nevirapine, was given to the mother during labor and to the infant after birth. Nevirapine halves the risk of peripartum transmission. ³ Nevirapine based therapy are the most widely available and affordable treatment in resource limited countries where more than 95% of infection in infants and children occur.

Infection to newborns is transmitted by mother prenatally; however, considering the role of the male partner in the transmission of infection to a woman, in India it is appropriately termed as parent to child transmission (PTCT).

Gujarat HIV Sentinel Survey (HSS), 2007, covering 9517 antenatal care-seeking women (ANCs), showed the median positivity rate of 0.46% HIV infection among ANCs. ³

In July 2010 WHO issued new HIV and AIDS guidelines on PMTCT and on HIV and Breast feeding ⁹. For both PMTCT and infant feeding there are major differences between these 2010 recommendations and previous guidance issued in 2006. Under the 2010 guidelines all HIV positive mothers identified during pregnancy should receive a course of anti retroviral drugs to prevent MTCT. All infants born to HIV positive mothers should also receive a course of anti

retroviral drugs and should be exclusively breast feed for six months and complimentary fed for upto 1 yr¹¹.

Previous guidelines issued in 2006 recommended that only women with low CD4 count should receive a combination of HIV and AIDS drugs to prevent MTCT and all HIV positive mothers were advised to exclusively breast feed for 6 months and then rapidly wean to avoid transmitting HIV to their infants¹⁰. Countries where resources are limited still these guidelines are used. In 2012 WHO released update of 2010 guidelines which provide third option for PMTCT¹². The decision to adopt either option A, B or B+ should be made at a country level.

It is estimated that there are between 22,000 and 61, 00 HIV pregnant women living with HIV in India. Although the percentage of pregnant women tested for HIV increased from 2% in 2005 to 23% in 2010. Testing coverage is still low¹⁴. India has adapted the WHO PMTCT option A regimen for PMTCT and the discussions are underway on whether to shift to option B regimen. A coasted national PMTCT scale up plan (2010-2015) is in place^{20, 21}. An MTCT transmission rate in 2010 was 12-97%. Estimated 18-49% of HIV exposed infants received ARVs for PMTCT in 2010¹⁸.

According to health facility data, the majority of pregnant women (96%) attended at least one ANC visit in 2010. However survey data suggests, significantly fewer attend at least four ANC visits as recommended by WHO. Survey data from 2007-2008 indicate that 75% of the women attended at least one ANC visit while only half (51%) attended at least four and women in urban areas were more likely than women in rural areas to attend four (70% vs. 41%). Despite good ANC coverage, only 53% pregnant women accessed skilled birth attendance at delivery in 2007-2008 and, in 2010, only 23% tested for HIV. An estimated 18% to 49% of HIV-exposed infants received ARVs for PMTCT in 2010^{18, 19}.

In 2010, nearly two-thirds (63%) of pregnant women identified as living with HIV were accessed with CD4 testing to determine if there were in need of treatment for their own health. The availability of early infant diagnostic services was very limited. Between 2-5% of HIV exposing infants were tested for HIV within 2 months of birth in 2010 and 2-7% received co-trimoxazole prophylaxis. India's PMTCT guidelines were revised in 2010 to provide more efficacious ARV regimens for pregnant women living with HIV however in 2010; single dose nevirapin was the primary regimen available¹⁸.

Global 2015 targets are to reduce the number of new HIV infection among the children by 90%, reduce the number of HIV associated deaths to women during pregnancy delivery or puerperium by 50%, reduce under 5 deaths due to HIV by at least 50%, Provide anti retroviral therapy for all children with HIV. Reduce MTCT of HIV to <5% and 90% of mothers should receive ARTs/ARVs and 90% of breast feeding infant

mother pairs should receive ARTs/ARVs by the year 2015^{20, 21}.

In Gujarat, ANC testing is now scaled up to 400 integrated counselling and Testing Centres (ICTCs) from 14 in 2005-06 including 289 stand-alone and 111 facility-integrated ICTCs. Estimated annual pregnancies in Gujarat are estimated to be around 14 lakhs out of which around 55% deliveries take place in the public sector⁶.

To meet the targets for India by 2015 expansion of PMTCT services are urgently needed to improve intervention coverage. To do this effectively India needs to define optimal programming approaches in a low prevalence and population settings. Identify bottlenecks to MCH services, access and improve ANC visit retention and skilled delivery is critical, including engagement of the private sector and community groups. Expand provision of CTX prophylaxis, early infant diagnosis, ARVs for PMTCT and ART for children with HIV also needed to meet the target. Strengthening routine monitoring system is required to ensure timely collection and reporting of quality data on global plan indicators.

MATERIAL AND METHODS

This is a prospective observational study conducted in a tertiary care centre of Ahmedabad. The study was conducted from January 2010 to June 2012. All babies born to HIV positive mothers diagnosed from antenatal OPD were enrolled in the study. Also babies of HIV positive mother who came to paediatric OPD who were less than 18 months of age were also included in the study. All mothers were properly explained and informed consent was taken. Mothers were assured about secrecy and we tried to maintain secrecy throughout the study. Mothers were given prepared questionnaires regarding their background information like age, parity, active married life, socio-economic class. Detailed obstetric history and birth history was taken. Maternal investigation including CD4 counts was noted.

Detailed maternal treatment history was taken. After delivery babies were followed up to 18 months. Babies' treatment history was noted. In this study, as the centre is a ART centre in a tertiary care hospital WHO option plan A was followed, according to which all mothers diagnosed with HIV having CD4 count <350 cells/mm³ were started on triple ARVs. Single dose nevirapin to mother in the dose of 200 mg tablet at the onset of labor was given⁴. And nevirapin syrup (2mg/kg of body weight) is offered to the babies within 72 hours of birth. The mother and babies who were not available for timely interventions missed this treatment.

Our motto was early infant diagnosis. All babies less than 6 months of age were diagnosed by DNA PCR testing and any seropositive result was confirmed by whole blood sampling. All babies' sero diagnosis was sent two months after stoppage of breast feeding. At the end of 18 months all serodiagnosis were confirmed

by 3 rapid diagnostic tests. Cotrimoxazole prophylaxis was given to all babies' before confirmed seronegative.

Total 86 babies were enrolled in the study. Out of these 6 babies were died due to some another causes before 18 months and 10 babies were lost in follow up upto 18 months. Total 70 babies were followed up to 18 months among which 8 were HIV positive and 62 were HIV

NEGATIVE. Thus, mother to child transmission rate was 11.4%.

Table 1: Incidence of sero – positivity in infants

Babies	Sero-positive	Sero-negative
n=70	8	62
Percentage	11.4%	88.6%

Table 2 Relation of Seropositivity of HIV into babies with different factors & their valuabilities

		HIV Positive (N=8)	HIV Negative (N=62)	Total (N=70)	P Value	Odds Ratio
Single dose nevirapin to mother	Yes	3 (5.1 %)	55 (94.9 %)	58	> 0.0001	0.07
	No	5 (41.6%)	7 (58.2%)	12	Significant	
Single dose nevirapin to baby	Yes	2 (3.3 %)	58 (96.7 %)	60	> 0.0001	0.04
	No	6 (60%)	4 (40 %)	10	Significant	
Antenatal ART to mother	Yes	1 (3.7%)	26 (96.3%)	27	0.0221	0.197
	No	7 (16.3%)	36 (83.7%)	43		
Exclusive BF for 3-6 month	Yes	6 (12.5%)	42 (87.5%)	48	0.99	1.42
	No	2 (9.09%)	20 (90.9%)	22		
Mood of delivery	LSCS	3 (9.4%)	29 (90.6 %)	32	0.9	0.68
	ND	5 (13.1%)	33 (86.9%)	38		

DISCUSSION

This study was done in a tertiary care hospital of Ahmedabad city. All antenatal mothers were counselled for HIV diagnosis and among them all HIV positive mothers' babies were enrolled in the study. All babies were followed up to 18 months. 10 babies were lost in follow up and 6 babies were died before completion of study so were not included in study. Among remaining 70 babies, 8 babies were confirmed seropositive at 18 months of age so in this study MTCT rate was 11.4%.

According to WHO guidelines 2010 MTCT rate was 12 -97% by the end of 2010.¹⁸ In our ART centre all mothers were counselled according to NACO guidelines and they were following WHO option A regimen for treating HIV positive regimens. Primary goal of the centre was diagnosis of HIV positive from all antenatal women, good MCH services, counselling, hospital delivery, early infant diagnosis and interventions to reduce MTCT, CTX to all babies of HIV positive mothers. We have seen that in our study SD NVP was given to all mothers before delivery as 200 mg tab some babies who were outside delivered their mothers did not get SDNVP. MTCT rate was 5.1% in the mothers who have taken SDNVP than 41.6% who have not taken SDNVP. Protectivity of SDNVP was almost 93 % (OR). All babies born to HIV positive mothers were given SDNVP as 2 mg/kg of dose within 72 hours of birth. MTCT rate was 3.3% who has taken it than 60% who has not taken it .The protectivity of SDNVP to babies' was seen 96% (OR). Thus, SDNVP to mother baby pair has 93-97% protectivity in mother to child transmission of HIV.

India is still a country with limited resources. It has still limited access to PMTCT services despite good ANC coverage. SD NVP both to mother and baby is still widely used to prevent MTCT. According to 2010 data

only 2 -5% babies born to HIV positive mothers receive ARVs for PMTCT, CTX prophylaxis, and EID. We have tried to diagnose all exposed babies before 18 months of age and gave CTX prophylaxis to all babies until confirmed seronegative.

In our study we have seen that protectivity level of mode of delivery either LSCS or ND was almost same. We have tried not to do artificial rupture of membrane in ND to decrease transmission. 9.4% among LSCS and 13.1% among ND were seropositive. where p value was not significant.

In our hospital we still advise mothers to give breastfeeding up to 3 to 6 months. We do not prefer mix feeding. All mothers were advised to stop BF abruptly. Serodiagnosis was done in all babies after two months of stoppage of feeding. The couples where top feeding was feasible we gave them option of top milk and we have seen that 12.5% among BF and 9% of babies on top milk were seropositive. In the presence of other interventions feeding practice has not significant role in PMTCT.

We have adopted WHO option A regimen for treatment of HIV positive pregnant women all women on CD4 count less than 350 cells/mm³ were on ART some of them has drop out from treatment and some has not taken at all this was limitation of study still among all mothers who has taken ART only 3% was seropositive. Thus ART has a good protectivity rate when women have low CD4 count and high viral load.

Global 2015 targets of WHO is to reduce number of new HIV infections among children by 90% and decrease HIV associated deaths to women during pregnancy, delivery or puerperium by 50%, decrease under 5 deaths due to HIV by atleast 50% and provide antiretroviral therapy to all children with HIV and decrease MTCT rates less than 5%. Over past decade

many low ,middle income countries had achieve at least 80% coverage of services to prevent HIV transmission to babies but still in country like India where resources are limited old interventions are used for PMTCT. We have studied that just by improving ANC coverage, counselling and old intervention drugs and techniques we can decrease MTCT rate to 11% but for reaching towards the targets of 2015 we have to phase out it as a matter of priority in accordance with recent WHO guidelines. It will also leverage broader efforts to improve maternal and child health, the technical expertise of other countries, the aid effectiveness agenda, renewed engagement of regional bodies as well as development in research policies for focused and simplified treatment and interventions.

CONCLUSION

It is estimated that there are 22,000 to 61,000 HIV pregnant women living with HIV in India till today ¹⁴. Prevention of mother to child transmission is still very demanding task for reaching towards global targets 2015. This study was done in ART centre of tertiary care hospital taking in account of good ANC coverage, good MCH services, EID, timely ART, proper counselling. In our study MTCT rate was 11.4%. Among all interventions SDNVP to mother and baby both had a significant protectivity 93-96% for MTCT. In the mothers with high viral load and low CD4 count timely starting of ART had also 81% protectivity. Still breast feeding was given as a primary feeding option and in the presence of other interventions feeding practices can not affect much on MTCT.

Reaching toward global plan 2015(20, 21) all pregnant women access to quality life saving HIV prevention treatment services for themselves and their children and for that adequate resources human and financial should be available both at community, national and international level in timely and predictable manner.

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