

Original Research Article

Prevention of parent to child transmission of HIV: where are we? a decade's analysis

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ABSTRACT

Background: Vertical transmission of HIV remains the main source of pediatric HIV infection with transmission rates as high as 25%-45% without intervention. This rate can be reduced to levels below 2% with effective interventions.

Methods: This study summarizes the interventions taken up by the PPTCT centre from 2003 to 2014. The interventions were based on WHO guidelines adopted by NACO. All HIV positive mothers who were followed up or referred to sisu raksha-PPTCT centre were included in the study and their infants were followed up till 18 months of age. All the HIV positive mothers were given appropriate counselling and CD4 count estimation was done. They were given antiretroviral drugs as per respective WHO guidelines adopted by NACO and were counselled regarding feeding option. The babies were given antiretroviral drugs as per guidelines and were followed up for a period of 18 months after birth.

Results: From 2003 to 2010, the rate of mother to child transmission was 5.2% (30/573). From 2011 to 2014, after implementation of WHO 2010 guidelines, the transmission rate reduced to 3.5% (12/342). Further analysis of the data was done. From 2003 to 2010, 72.6% (441/607) mothers practiced exclusive breastfeeding. From 2011 and 2014, 95.5% (345/361) mothers practiced exclusive breastfeeding.

Conclusions: Effective implementation of WHO PPTCT guidelines, early diagnosis in pregnancy, antiretroviral drug intake in mother and Nevirapine prophylaxis to the baby together reduce mother to child transmission of HIV considerably.

Keywords: HIV (Human Immunodeficiency Virus), NACO (National AIDS Control Organization), PPTCT (Prevention of Parent to Child Transmission), WHO (World Health Organization)

INTRODUCTION

Vertical transmission of HIV remains the main source of pediatric HIV infection with transmission rates as high as 25%-45% without intervention. This rate can be reduced to levels below 2% with effective interventions. PPTCT programme was started by NACO in June 2001. Under the pilot study by NACO, short course Zidovudine regimen was used, and they showed 50% reduction in the mother to child transmission rates. From December 2002,

PPTCT program was introduced in all district hospitals where single dose Nevirapine therapy was started.

Since WHO issued revised guidelines in 2006, important evidence has emerged on the use of antiretroviral (ARV) prophylaxis/ antiretroviral therapy (ART) to prevent MTCT and on safe feeding practices for HIV-exposed infants. Based on this evidence again in 2010, guidelines were developed by WHO to provide international standards primarily for low- and middle-income settings.

Once implemented, these recommendations could reduce the risk of MTCT to less than 5% (or even lower) in breastfeeding population from a background risk of 35%, and to less than 2% in non-breastfeeding populations from a background risk of 25% and will ensure increased maternal and child survival.¹

PPTCT programme was started in BCHI and RC Davangere in the year 2003 with an aim to reduce the perinatal transmission of HIV by providing package of services like effective access to antenatal testing, counselling, antiretroviral therapy (ART), safe delivery practices, and appropriate infant feeding practice including access to antiretroviral drugs to prevent HIV transmission to infants, all of which have contributed in reducing the rate of MTCT from 4.25% to 1.7% over a period of 10 years. The objective of this study was to evaluate the impact of PPTCT interventions on parent to child transmission of HIV and to determine the impact of increasing uptake of exclusive breastfeeding as infant feeding option.

METHODS

This study was conducted at Sisu Raksha-PPTCT Project, Bapuji Child Health Institute and Research Centre, attached to JJM Medical College, Davangere. This study summarizes the interventions taken up by the PPTCT center from 2003 to 2014. The interventions were based on WHO guidelines adopted by NACO.

Pregnant mothers attending the antenatal clinics were screened for HIV in the present setup which includes 2 Government Hospitals and 4 referral hospitals. All HIV positive mothers who were followed up or referred to Sisu Raksha-PPTCT centre were included in the study and their infants were followed up till 18 months of age.

All the HIV positive mothers were given appropriate counselling and CD4 count estimation was done. They were given antiretroviral drugs as per respective WHO guidelines adopted by NACO. They were also counselled regarding feeding option for their babies. The babies were given antiretroviral drugs as per guidelines and were followed up for a period of 18 months after birth. As per WHO 2010 infant feeding guidelines, increasing number of mothers were encouraged to breastfeed their babies. HIV status of the babies was determined by DNA-PCR testing in early life and by rapid antibody test at 18 months of age.

RESULTS

A total of 94,054 mothers were followed up in antenatal clinics from 2003 to 2014. Out of them, 1352 were found to be HIV positive. Of these mothers, 1001 delivered in our setup. After excluding intrauterine deaths, still births, 2 early neonatal deaths due to prematurity and respiratory distress syndrome, 968 babies were followed up with adequate feeding advice.

Table 1: Year wise follow up details of mother-baby pairs attending antiretroviral clinics.

YEAR	2003-2008	2009	2010	2011	2012	2013	2014	Total
Total ANC's tested	42960	13553	12330	13532	2767	3478	5434	95054
Total HIV +ve	591	183	146	157	103	103	69	1352
+ve women delivered	392	132	107	128	87	93	62	1001
Feeding options								
Exclusive breastfeeding	308	43	90	113	73	88	56	786
Replacement feeding	80	56	16	9	11	2	3	168
Mixed feeding	12	2	0	0	0	0	0	14
Children tested at 18 months	400	71	102	102	81	89	70	915
Children tested HIV -ve	383	67	93	99	79	86	67	873
Children tested HIV +ve	17 (4.25%)	4 (5.63%)	9 (8.82%)	3 (2.94%)	2 (2.4%)	4	3	42 (4.62%)

Of these 786 children were exclusively breast fed, 168 were given replacement feeding and the remaining 14 children were put on both breast feeds and replacement feeding. 53 children were lost to follow up at 18 months of age in the study. Of the remaining 915 babies who were followed up till 18 months of age, 873 were tested negative. 42 babies were infected with HIV which accounted for 4.6%.

From 2003 to 2010, a total of 573 children were tested and of these 30 were found to be positive and the rate of mother to child transmission was 5.2% (30/573). From 2011 to 2014, after implementation of WHO 2010 guidelines, of the total 342 children tested, 12 children were HIV positive and the transmission rate reduced to 3.5% (12/342).

Further analysis of the data was done. Of the total 968 babies, the mothers were given feeding options with a great emphasis on exclusive breast feeding.

Table 2: Comparison of rates of mother to child transmission of HIV before and after 2010.

	No. of babies tested	HIV +ve babies	Percentage
2003-2010	573	30	5.2
2011-2014	342	12	3.5
Total	915	42	4.6

Table 3: Comparison of number of babies who received breastfeeding before and after 2010.

	No. of mother counselled regarding feeding options	No. of mothers who opted for exclusive breast feeding	%
2003-2010	607	441	72.5
2011-2014	361	345	95.5
TOTAL	968	786	81.1

From 2003 to 2010, of the total 607 babies followed up, 441 mothers practiced exclusive breastfeeding which accounted for 72.6%. From 2011 and 2014, there is a greater increase in exclusive breast-feeding rates from 72.6% to 95.5%. 345 out of 361 mothers practiced exclusive breastfeeding.

DISCUSSION

PPTCT projects have been one of the most rewarding medical interventions of the last decade. This study shows that over the last decade, with effective implementation of WHO guidelines, parent to child transmission of HIV has been reduced to less than 10% until the year 2010 and to less than 5% in last 2 years. At the same time, percentage of infants breastfed has increased from 76% during the initial years (from 2003 to 2008) to 95.5% from 2011 to 2014.

The 2010 revised PMTCT recommendations are based on two key approaches:

- Lifelong ART for HIV-infected women in need of treatment for their own health, which is also safe and effective in reducing MTCT
- ARV prophylaxis to prevent MTCT during pregnancy, delivery and breastfeeding for HIV-infected women not in need of treatment.¹

In 2012, WHO recommended that HIV positive should begin a triple antiretroviral regimen immediately after being diagnosed, irrespective of their CD4 count. Mothers should remain on the same triple antiretroviral regimen throughout pregnancy and should continue for life.² The goal of WHO PMTCT strategic vision 2010-

2015 is to eliminate paediatric HIV infections and improve maternal, newborn and child health and survival in the context of HIV.³

In 2010, for developing countries, WHO recommended that 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 only stop once a nutritionally adequate and safe diet without breast milk can be provided (strong recommendation). High quality of evidence for first six months of life.⁴

A study at Johannesburg showed low transmission rates of HIV with effective implementation of PPTCT interventions.⁵

A study conducted at Botswana showed that all regimens of HAART from pregnancy through 6 months postpartum resulted in high rates of virologic suppression, with an overall rate of mother-to-child transmission of 1.1%.⁶

A study conducted at Riyadh, Saudi Arabia showed that diagnosis, management, and antiretroviral therapy almost eliminated mother-to-child transmission of HIV-1 in their patient population.⁷

The Armed Forces Medical Services (AFMS) protocol of Universal screening of HIV infection in all pregnant women, HAART administration to all HIV positive pregnant women from second trimester, Elective Caesarean Section for all women who have a viral load above the cut-off of 50 copies/ml and universal supplementary feeding to all newborn infants (and no breast feeding) has reduced the MTCT to near zero.⁸

Ekouevi et al have reported in Cote d'Ivoire a significantly lower transmission rate among infants with maternal HAART (2.3%), compared to single dose nevirapine (16.1%), and in two other PMTCT programs in South Africa and Cameroon, rates of HIV transmission of 5% and 6.6% were observed.⁹⁻¹¹

In a study conducted in 2006-2008 in rural Kenya, occurrence of MTCT was more frequent (15%), although infant mortality was relatively limited.¹² The higher transmission rate in this study might reflect differences in health settings or social conditions and might also be a consequence of the earlier diagnosis of infant infection with virological testing.

Other studies have also reported information on infant mortality: Kouanda et al in urban Burkina Faso report a remarkable null transmission rate with maternal HAART, but infant mortality was present, even in the subgroup of maternal HAART.¹³ In a PMTCT program conducted in Northern Uganda, the rate of HIV transmission or HIV-related death among infants was 15.5%.¹⁴

CONCLUSION

Effective implementation of WHO PPTCT guidelines, early diagnosis in pregnancy, antiretroviral drug intake in mother and Nevirapine prophylaxis to the baby together reduce mother to child transmission of HIV considerably. In resource limited settings, HIV positive mothers can choose to breastfeed their babies with effective antiretroviral drug coverage

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