Original Article

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Obstetrics and Gynaecology Section

# Prevention of Parent to Child Transmission of HIV: Single Centre Experience of 14 years at Tertiary Care Hospital in Delhi, India

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## ABSTRACT

**Introduction:** Prevention of Parent To Child Transmission (PPTCT) of HIV/AIDS is an integral component of AIDS control programme. PPTCT is an ongoing programme since last 15 years.

**Aim:** The aim of the study was to evaluate the reduction in the burden of disease in newborn and infants by prevention of parents to child transmission of HIV/AIDS.

**Materials and Methods:** This retrospective study was conducted at Department of Obstetrics and Gynecology in a tertiary care hospital of Delhi from May 2002 to May 2015. The data was collected from records of maternal details registered at PPTCT clinic as well as list of infants undergoing Early Infant Diagnosis (EID) recorded in the standard format as per instructions from National AIDS Control Organization (NACO) of India. The Programme performance was assessed against performance indicators stated by NACO, India.

**Results:** Evaluation was done by dividing study period into two halves of seven years each. Out of 2,52,447 new antenatal case registration, overall, 43% received pretest of which, 91% were tested. Antenatal seropositivity rate varied from 0.1%-0.25%. Of 243 seropositive antenatal women 187 partners tested positive. While 25 women opted for MTP, 15 had still births. There were 17 neonatal deaths at 3-12 months attributable to respiratory infections and diarrheal diseases. Operative delivery rates declined from 50% to 31% over the years. Most women opted for breast feeding. The lost to follow up rate of newborns was quite high with details of only 43.5% being available at 18 months of infant's age. A total of three infants tested HIV positive at 18 months of age.

**Conclusion:** The study highlights the practical aspects of policy implementation and operational issues involved in low resource country.

**Keywords**: Antenatal woman, Antiretroviral therapy, Nevirapine

## INTRODUCTION

PPTCT of HIV/AIDS is an integral component of AIDS control programmes since Mother To Child Transmission (MTCT) of HIV/AIDS accounts for over 90% of new infections in children [1]. Without any intervention, the risk of MTCT is estimated at 15%-45% which is reduced to below 5% with the current strategy [2]. Till the year 2013, single dose evirapine (NVP) to the mother baby pair was practiced in India. This reduced the risk of (MTCT) to 16% (in breastfed) and 11% (with replacement feed) [3]. Concerns of viral resistance with Sd-Nevirapine compromising subsequent treatment led to the change in strategy. Based on the current policy of NACO, India, is to prescribe lifelong Antiretroviral Therapy (ART) to all seropositive pregnant women regardless of CD4 count or WHO clinical stage, both for their own health and to prevent vertical HIV transmission from mother to child [4]. An estimated 2.1 million PLHIV (People Living with HIV/AIDS) live in India; of these women constitute 39% while 7% are children below 15 years [5]. With such high numbers, PPTCT is of utmost importance to control the number of newborns infected with the virus.

With the introduction of HAART (highly active antiretroviral therapy), HIV transmission has been reduced significantly. As also reported by Ngemu et al., in 2014, viral load in mother was significantly reduced with HAART ($Z=11.324$, $p<0.001$) and about 90% of the children were HIV negative [6].

In another study, in an urban hospital in Angola (2012), it was reported that estimated rates of HIV transmission and death in infants was 8.5% if mother is on ART and 38.9% without ART on a median follow up of 74 weeks [7].

Guru Teg Bahadur (GTB) Hospital caters to the highly populous East Delhi and West Uttar Pradesh belt. The PPTCT programme started at the hospital in 2002 but ART service were established in November 2005.

The PPTCT strategy which is carried out at the Antenatal Clinic of the hospital includes group counselling followed by individual consent. "Opt out" approach is adopted while offering HIV testing. After obtaining an informed consent, HIV testing is done using Rapid test kits namely, Comb-aid (SD diagnostics Ltd.), AIDS-scan trispot (Bharat biotechnology Ltd) and SD Bioline. These kits are supplied by NACO. According to NACO policy, all three tests are required to be positive to diagnose seropositivity [8]. The report is available within 24 hours of testing. Post-test counselling was done for all the women who reported for collecting reports of HIV test before revealing the result. Pregnant women testing positive for HIV are advised Pap smear & VDRL testing, referral to ART centre, TB centre and importance of institutional delivery is re-emphasised. These women were also informed about the neonatal feeding options, neonatal follow up with Dried Blood Smear (DBS) and neonatal Antiretroviral (ARV) prophylaxis. Information about the benefits of use of condom, partner testing is also imparted. Women requesting for pregnancy termination were referred to the Family Welfare clinic for appropriate management.

The aim of the study was to study the impact of PPTCT programme in reduction disease burden in newborn and infants.

## MATERIALS AND METHODS

The PPTCT programme started in the year 2002 at GTB Hospital. The staffs posted at the centre are two counsellors and laboratory

technicians each. This retrospective study was conducted at a tertiary care teaching hospital of Delhi, India. The Institutional ethical clearance was obtained before commencement of the study. Data of 14 years from May 2002 to May 2015 was extracted for retrospective analysis from hospital records. Other than the demographic details, the following performance indicators were assessed (as per NACO Guideline) [9]:

1. Number of New ANC (Antenatal Clinic) Registrations;
2. Number of pregnant women provided with pre-test counselling;
3. Out of all registered number of pregnant women tested for HIV;
4. Total number of pregnant women detected HIV positive;
5. Number of pregnant women who received post-test counselling and given test results;
6. Number of spouses/partners of HIV infected pregnant women tested for HIV;
7. Number of spouses/partners of HIV infected pregnant women found infected;
8. Number of HIV infected pregnant women who underwent MTP (Medical termination of pregnancy);
9. Total number of deliveries of HIV infected women (vaginal + LSCS);
10. Total number of HIV infected women opting for breast feed for first six months;
11. Total number of HIV infected women opting for replacement feeding for first six months

Treatment of HIV positive pregnant women was based on the existing NACO recommendations. The women received combination of Ziduvudine, Nevirapine and Lamivudine for CD4 count less than 350/ml$^3$ or peripartum single dose nevirapine to mother baby pair when CD4 counts were more than 350/ml$^3$ till a change of policy resulting in Tenovofir, Lamivudine and Efavirenz to all positive women with prolonged coverage of the neonate 2013 onwards. Of the total, 218 mother baby pairs (89.7%) received prophylactic ART coverage.

## STATISTICAL ANAYLSIS

Statistical evaluation of the results was done by using Computer Software SPSS Version 20.0.

The results are expressed in percentage.

## RESULTS

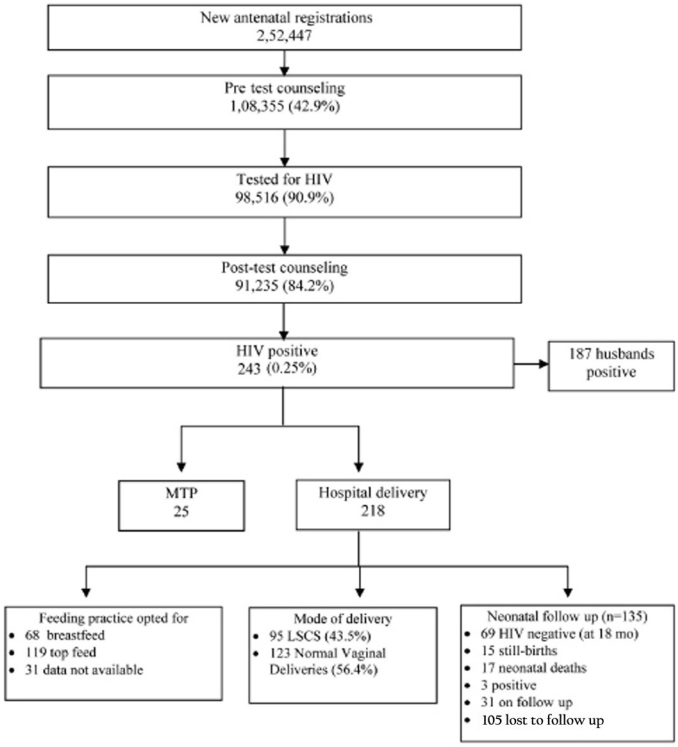
The results were viewed separately in two blocks of seven years each i.e., 2002-08 and 2009-15 since there was an obvious difference in performance. Teething problems of a new programme compounded by deficient manpower and inadequate data maintenance were evident in the initial seven years. Compilation of data in the period 2002 to 2009 was found difficult due to non uniform recording. Total of 2,52,447 new antenatal registrations were recorded in the period of 14 years from 2002 to 2015. Overall, 43% (28.2% and 54.6%) of antenatal mothers received pretest counseling of which, 91% were tested [Table/Fig-1] Antenatal seropositivity rate varied from 0.09%-0.25% [Table/Fig-2]. Highest rate of seropositivity was 0.25%, reported in year 2015 and least rate was 0.09% in the year 2007 [Table/Fig-2].

Heterosexual route was the most common mode for disease acquisition. Demographic characteristics are shown in [Table/Fig-3] Despite efforts, testing of spouse was limited to seropositive women. 187 partners tested positive of which 41% were migrant workers, 21% drivers, 1.6% were intravenous drug users.

Overall, 243 seropositive antenatal women were detected in the 14 year period. While 25 women opted for MTP, 15 had still births. of the remaining 203 sero-positive pregnant women, there were 17 neonatal deaths at 3-12 months attributable to respiratory infections and diarrheal diseases. Seven of these infants were positive by DBS at three months. The lost to follow up rate of infants was very high with details of 43.5% being available at completion of 18 months of infant's age and of these three babies tested HIV positive. of the total 218 mother who carried on their pregnancies, all the mother baby pairs received prophylactic ART coverage.

Comparing the two blocks of seven years each, there is a definite improvement in each aspect of service delivery as can be observed from [Table/Fig-4]. While the cesarean delivery rates were high at 50% initially, it decreased to 31.4% in the latter half. Overall top feeding was the preferred option (119/186) indicated by the pregnant mother in antenatal clinic. There was improvement in neonatal follow up with reduction in lost to follow up from 70% to 50%.

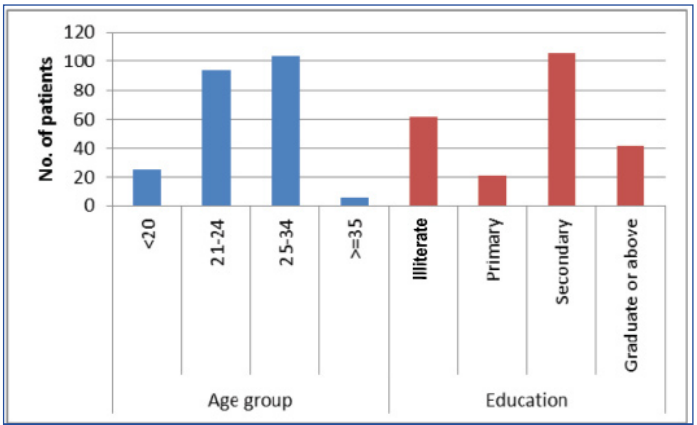
## DISCUSSION




**[Table/Fig-1]:** PPTCT services in Antenatal clinic (2002-2015).

| year | Prevalence (%) |
|---|---|
| 2002 | 0.24 |
| 2003 | 0.15 |
| 2004 | 0.16 |
| 2005 | 0.13 |
| 2006 | 0.23 |
| 2007 | 0.09 |
| 2008 | 0.24 |
| 2009 | 0.12 |
| 2010 | 0.18 |
| 2011 | 0.13 |
| 2012 | 0.21 |
| 2013 | 0.18 |
| 2014 | 0.20 |
| 2015 | 0.25 |

**[Table/Fig-2]:** Year wise prevalence trend of HIV positive patients.




**[Table/Fig-3]:** Demographic characters of seropositive patients.

| | 2002-2008 | 2009-2015 | Total |
|---|---|---|---|
| Total number of new ANC | 112,531 | 139,916 | 2,52,447 |
| Pretest counseling | 31,846(28.2%) | 76,509(54.6%) | 108,355(42.9%) |
| HIV Testing | 22,513(70.6%) | 75,643(98.8%) | 98,156(90.2%) |
| Post-test counseling | 20,851(65.4%) | 70,434(93.1%) | 91,285(84.2%) |
| Husbands | 56 | 131 | 187 |
| HIV tests positive | 100 | 143 | 243 |
| MTP | 13 | 12 | 25 |
| Net HIV positive pregnancies | 87 | 131 | 218 |
| Cesarean | 50 | 45 | 95 |
| Normal vaginal delivery | 37 | 86 | 123 |
| Breast feed | 15 | 53 | 68/186* |
| Top feed | 41 | 78 | 119/186* |
| Baby outcome | | | |
| Still births | 9 | 6 | 15 |
| Neonatal deaths | 12 | 5 | 17 |
| Lost to follow up | 46/66 | 59/120 | 105/186 |
| Babies(n=81) on follow-up, 50 > 18 months; 31< 18months | | | |
| Positive at 18 months | 1 | 2 | 3 |

**[Table/Fig-4]:** PPTCT services at our Hospital in two blocks of seven years each. *Data of 32 mothers not available.

In the current study, there was a definite improvement of services over the 14 years: pretest counseling improved from 28.2% (2002-08) to 54.6% (2009-15), HIV testing from 70.6% to 98.8%. Post-test counseling also improved from 65.4% to 93.1%. Sustained efforts through awareness building activities in antenatal clinic and also among medical and paramedical workers at the hospital, increase in manpower, regular training of counselors could bring this change.

With the use of HAART strategies, PPTCT has been virtually eliminated in developed countries [10]. However, the prevention of transmission has still remained a major challenge for developing countries. Globally, an estimated 3,70,000 children were newly infected with HIV in 2009, and most of them were from low and middle income countries [11]. The HIV prevalence observed among ANC clinic attendees is considered a proxy for HIV prevalence in general population. Its prevalence in 2014-15 was 0.29% (90% CI: 0.28-0.31) and 0.25% in Delhi [5]. Average seroprevalence rate seen in our study was also 0.25%.

The National Agency for Control of AIDS, Nigeria in 2010 reported that only 16.9% of women were tested for HIV [12]. According to UN general assembly special session report, just 20% of the annual estimates of pregnant women in India were counseled and tested for HIV in 2009. Furthermore, only 30% of the estimated HIV infected pregnant women were identified; of these about 60% received sd-NVP which was the national protocol at that time [13]. Antenatal coverage of PPTCT service has been reported to range from 52.4% [14] to more than 95% [15,16]. The opt out approach has consistently resulted in >95% uptake of HIV antibody testing across a variety of international settings [17]. Indian studies have reported testing rates ranging from as low as 64.3% [18] to as high as 92.6% [15]. The percentage of pregnant women accepting HIV test (as percentage of pre-test counseled women) in all the SACS was found to be about or over 90% during 2007-2008 [19]. Testing rates improved from 70.6% in earlier years to 98.8% in the present study too.

Among all the seropositive women delivered at our hospital, average cesarean and normal vaginal delivery rate was 43.5% and 56.4% respectively. In the initial years, cesarean rates were quite high (57%) but with continuous trainings the trends changed and in the later years with higher rates of vaginal delivery (65.6%). Vaginal delivery rates of 46%-66% [20,21] have been mentioned in other studies from India. In this era of HAART, with MCTC as low as 0% following vaginal delivery, high rates of operative delivery point towards an urgent need to sensitize the staff [22]. Majority of women in the present study were in the age group 21-34 years (86.4%) and most common route was heterosexual transmission (90.5%). Similar findings have also been observed in other studies [23,24].

A major limitation of our study continues to be high lost to follow up of infants initially upto 70% but later reduced to 50% with the introduction of dried blood spot at six weeks. Other studies from India have also reported quite high lost to follow up rates ranging from 29% to 67.8% [17,25,26] while in African studies it is seen to vary from 20.8% to 66% [27-29]. Reason for such high rates could be due to high migration rates, birth of a sibling resulting in shift of focus from affected child and to a lesser extent due to lack of awareness despite the high intensity awareness building strategies. These findings emphasize the need for actively developing a tracking system. Operational research studies have evaluated different healthcare delivery models for providing PMTCT services. In a study from western Kenya outcome was compared between 179 HIV-exposed infants seen at clinics that integrated PMTCT follow up services into Maternal and Child Health (MCH) services and 184 infants in an HIV comprehensive care clinic from age six weeks to 12 months [30]. Follow up was better through PMTCT services that were integrated into the MCH clinics compared to delivery of services in the HIV comprehensive care clinics. Seropositivity among the infants could not be calculated in the current study due to high rate of lost to follow ups. Various studies in India have reported seropositivity rate ranging from 3.6% to 15% [15,20].

Involvement of male partner is an essential component for successful implementation of PPTCT programme. In the initial years of our programme, couple counselling and testing was done but since majority of the time the husbands were not found to be accompanying the women, their participation remained low. Hence, testing was insisted for the husbands of serospositive women only. Most of the partners (87.7%) were found HIV positive. Similar findings were also observed by Chauhan G et al. [31].

Despite an improvement over the years, the lost to follow up rates of infants remains high.

## CONCLUSION

This report highlights the strengths and weaknesses thereby of the PPTCT programme developed over 14 years thereby providing an opportunity for improvement. It also gives a perspective of the practical aspects of policy implementation and operational issues involved in low resource country.

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