



Seroprevalence and utilization of therapeutic intervention in PPTCT services in a teaching hospital in Kolkata

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OBJECTIVE(S) : To determine the prevalence of HIV during pregnancy, demographic factors of pregnant women testing positive for HIV and the utilization of therapeutic interventions to minimize the risk of mother-to-child transmission (MTCT) in prevention of parent to child transmission (PPTCT) services.

METHOD(S) : Pregnant women presenting to tertiary care center in Kolkata from 1st January, 2004 to 31st December, 2005 had HIV serology performed by Rapid Test after receiving counseling in groups of 10-15. Care was administered using a standard protocol by a multi-disciplinary team of healthcare personnel. Antiretroviral prophylaxis with nevirapine was given to seropositive women and their children.

RESULTS : Of the 25,394 new antenatal booking visits 22,850 (89.98%) women attended pretest counseling and 21,369 (83.23%) of them accepted HIV testing. Thirty-five women were found to be seropositive. Seroprevalence rate of HIV infection was 0.16%. Majority of the 35 HIV infected women were primiparous, Hindu, addiction free, and with multiple sex partners of the husband or the woman herself sex partners. Only 28 (28/35, 80%) came for collecting their reports and 19 of them received treatment at our hospital. Of the 35 seropositive women five (17.85%) opted for pregnancy termination and 14 have delivered and all of them have live born babies. All these mothers and their newborns (100%) have received nevirapine prophylaxis.

CONCLUSION(S) : The seroprevalence of HIV infection among antenatal women is low. Uptake of interventions aimed at reducing the risk of mother-to-child HIV transmission is high but the follow up of children is limited.

Key words : HIV, PPTCT, Mother to child transmission

Introduction

The human immuno deficiency virus (HIV) pandemic is spreading and increasing steadily through out the globe. The principal mode of spread is heterosexual activity, however, the vast majority of children acquire the infection by perinatal transmission. Maternal to fetal or infant (vertical) transmission of HIV may occur during pregnancy, during children or through breast-feeding. Vertical transmission of HIV infection is reported in 25-35% of babies born to HIV

positive women in Asia ¹. The prevention of vertical transmission is of paramount importance in reducing the prevalence of pediatric HIV and total number of HIV infected patients.

HIV counseling and voluntary antenatal testing offer opportunities to detect HIV infection and to prevent transmission of the infection to the offspring. Before making an informed decision about whether to be tested, a woman needs to know how HIV infection is acquired and what infection means for her health and that of her infant. Counseling can help uninfected women to assess their current or future risk of HIV infection, as well as reinforce the need for behavior that reduces risk, such as, limiting the number of sexual partners and using condoms. Identification of the women with HIV infection during pregnancy allows the

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woman to take an informed decision about continuing the pregnancy and about the intervention to decrease the risk of mother to child transmission (MTCT).

The West Bengal State AIDS Prevention & Control Society introduced PPTCT (Prevention of Parent to Child Transmission) services on 1st December, 2003. From the start of the service, the uptake of antenatal testing for HIV and the therapeutic intervention to reduce mother to child transmission (MTCT) of HIV infection has been carefully monitored. This paper analysis the offer to test for HIV, uptake of HIV screening program and therapeutic intervention to reduced mother-to child transmission of HIV infection in a teaching hospital in West Bengal.

Methods

All the women registered in our antenatal clinic from 1st January, 2004 to 31st December, 2005 were given group counseling regarding testing for HIV. The counseling included history taking, audiovisual display regarding transmission of HIV infection, importance of antenatal care, condom demonstration, and signing the consent form. Women who gave their informed consent were tested for HIV. The testing procedure included three rapid tests (Comb, Tridot and SD Bioline). Initially reactive rapid tests were repeated in duplicate and specimen with repeatedly reactive three rapid tests was

considered positive according to the national guideline ¹. Collection of the report was accompanied by the posttest counseling session. If the woman was detected seropositive she was informed through one-to-one counseling session. In cases where the woman was interested and willing to inform her spouse or partner, the counseling session included the couple together. Partner information / notification and testing, and testing of other children, if any, followed subsequently. If the woman was willing termination of pregnancy this options for MTP, was considered. Those who were willing to continue pregnancy or were not eligible for MTP of women with advanced pregnancy were managed by integrated antenatal services by obstetrician and physician together. This included detailed history taking and physical examination, laboratory tests for complete blood count, routine and microscopic examination of urine, nutritional assessment, counseling, and screening for other sexually transmitted infection. Oral iron prophylaxis, tetanus toxoid immunization. Antiretroviral (ARV) drug treatment and prophylaxis during pregnancy according to national guidelines, safer delivery practices, counseling on infant feeding and planning for effective contraceptive use.

Results

There were 12,586 and 12808 new antenatal booking visits in 2004 and 2005 respectively. Of these 9,364 (74.4%) and

Table 1. Antenatal HIV testing uptake.

Antenatal HIV testing	2004	2005
New antenatal registration	12586	12808
Women attended pre test counseling	10514/1258(83.53%)	12336/12808 (96.31%)
Women accepted HIV testing	9364/10514 (89.06%)	11772/12336 (95.42%)
Women who attended posttest counseling and collected report	7681/9364 (82.02%)	10969/11772 (93.17%)
HIV positive	10 ^a /9364 (0.10%)	25 ^b /11772 (0.21%)
HIV positive women who attended post test counseling	7/10 (70%)	21 /25 (84%)
Spouses/partners of HIV positive women counseled and tested	6/7 (85.71%)	20/21 (95.23%)
Number of spouses / partners HIV positive	4/6 (66.66%)	9/20 (45%)
Number of previous children of HIV positive women who were tested for HIV	2 ^a	10 ^b
Number of previous children who were detected HIV positive	1 ^c	1 ^c
No of spouses/partners of HIV negative women counseled	329/7671(4.28%)	1800/10944 (16.44%)

^a Of the 10 HIV + ve women, 4 were primigravidas, 3 did not collect their reports and were not seen again, and 1 primipara had list her child at 7 months age due to diarrhea.

^b Of the 25 HIV + ve women, 6 were primigravidas, 4 did not collect their reports and were not seen again. 1 primipara had no living child, and of the remaining 14, only 10 brought their children for HIV testing and 4 did not.

^c Were breast fed for prolonged periods.

11,772 (91.9%) women accepted HIV testing in 2004 and 2005 respectively. Thirty-five women were found to be seropositive in the 2 years. Some women without prior registration of antenatal clinic were also counseled and tested for HIV. Seventy such women (data available since September 2004) in 2004 and 594 in 2005 were counseled and of them 62 (2/70,88.57%) and 591 (591/594;99.49%) accepted HIV testing and none were detected positive. The seroprevalence rate of HIV infection was 0.1% (10/9364) and 0.2% (25/12363) in 2004 and 2005 respectively (Table 1).

Table 2 and 3 show the demographic characteristics of seropositive women. The mean age of seropositive women was 23.91 ± 6.27 (SD) years. All women were booked for delivery in our institution a majority of them were primiparous, Hindu, addiction free, from low socioeconomic status and with or multiple sex partners of the husband or the women herself. None of these women were aware of their HIV status before pregnancy.

Table 2. Demographic characteristics of seropositive women.

Variables	Seropositive women N=35	Percentage
Age*	23.91 ± 6.27	
Parity 0	10/35	28.57
1	16/35	45.71
2	5/35	14.28
3	4/35	11.42
Social status-low	28/35	80
Middle-	7/35	20
High	-	-
Residence-Urban	18/35	51.42
Rural	17/35	48.57
Religion		
Hindu	28/35	80
Muslim-	7/35	20
Contraceptive practice-		
Condom-	1/35	2.85
O C Pill	3/35	8.57
None	31/35	88.57
Addiction -		
Pan chewing with tabacco	3/35	8.57
None	32/35	91.42
Multiple sex partners		
Husband -	16/35	45.71
Wife -	9/35	25.71
Both -	2/35	5.71
Commercial sex worker	6/35	17.14
Recipient of blood and blood products	1/35	2.85
AIDS in husband-	1/35	2.85
Active tuberculosis in husband	2/35	5.71

Table 3. Demographic characteristics of seropositive women (n=35)

	Seropositive	Percentage
Contraceptive practice		
Condom	1	2.85
O C Pill	3	8.57
None-	31	88.57
Addiction		
Chewing beetal leaves with tobacco	3	8.57
None	32	91.42
Multiple sex partners		
Husband	16	45.71
Wife	9	25.71
Both	2	5.71
Commercial sex worker	6	17.14
Recipient of blood and blood products	1	2.85
AIDS in husband	1	2.85
Active tuberculosis in husband	2	5.71

Table 4 shows the utilization of therapeutic intervention offered to seropositive women to reduce mother to child transmission of HIV. Of the 35 seropositive women 28 (80%) collected their reports. Of these 28 women, five (17.85%) opted for termination of pregnancy (MTP) and 14 women have delivered and all of them have time born babies. All of these mothers and newborns have received nevirapine prophylaxis. Three women (3/11, 27.27%) have opted for breastfeeding after counseling. Till now two mothers have turned up with their babies for the blood test at 18 months and both the babies proved HIV negative. The remaining 9 out of the 28 HIV+ve women were accounted as follows - one had MTP in a private nursing home, one refused admission and had home delivery, one delivered at another teaching hospital, and six after a few antenatal check-ups at our hospital were not seen again.

Table 4. Utilization of therapeutic intervention at our hospital (n=19).

	No. of Women /Newborn	Percentage
Termination of pregnancy	5/19	26.31%
Delivery	14/19	73.69
Live birth	14/14	100
Cesarean delivery	6/14	42.86
Vaginal delivery	8/14	57.14
Antiretroviral prophylaxis		
Mother	14/14	100
Newborn ^a	14/14	100

^a Five of the 14 babies have reached 18 months age by December 2006. Of these 2 came for HIV testing and both tested negative while the remaining 3 are last to followup. Of the 9 babies who are not 18 month old by December 2006 only 6 are coming followup and all of them are well and symptom free while the remaining 3 are last to follow-up.

Discussion

The timely administration of a potent combination of antiretroviral drugs during pregnancy can reduce the risk of mother-to-child HIV transmission to 2% or less, and also improve the health of the mother. But, first the pregnant women's HIV status must be known³. There are two ways to do voluntary HIV testing. In "opt in-approach pregnant women are given pretest counseling and they must agree to getting an HIV test, usually in writing. In 'opt out' approach pregnant women are told that an HIV test will be included in the standard group of prenatal tests (that is to say, test given to all pregnant women), and that they may decline the test. Unless they decline they will receive an HIV test. Center for Disease Control (CDC) recommends an opt out approach as the testing rate is 85-98% but with an opt in approach testing rate ranges from 25-83%^{3,4}. There have been policy moves endorsed by the World Health Organization and UNAIDS to introduce routine 'opt out' HIV testing in countries with high prevalence⁵. In one recent study conducted in Gujarat the acceptance of HIV testing through opt in approach was 90.6%⁶. In our study, the acceptance of HIV testing through "opt in" policy was 89% (9364/10514) and 95% (11772/12336) in 2004 and 2005 respectively. Even with such a high rate of testing, there are still a substantial number of women who pass through their antenatal and intranatal care where neither they nor their attendants are aware of HIV status (women who did not attend counseling - 2072 and 472 in 2004 and 2005 respectively and women who did not accepted HIV testing 1156 and 564 in 2004 and 2005 respectively). A positive test is distressing to the woman, but it is important to know her HIV status since effective treatment can be offered which will reduce the risk of transmission of infection to the baby⁷. Rapid tests can detect HIV antibody in 10-60 minutes at the point of care and they have sensitivity and specificity comparable to those of enzyme immunoassays. However, the predictive value of a single screening test varies with the prevalence of HIV infection among the population tested. Because HIV prevalence is low in most perinatal testing settings, the negative predictive value of a single rapid test (i.e., the probability that a negative test accurately indicates that the person tested is uninfected) is high. A negative rapid test does not require further testing. In contrast, the positive predictive value of a single test (i.e., the probability that a positive test represents true infection) will be low among populations with low prevalence. Therefore, a positive or reactive rapid screening test result should be supplemented with a confirmatory Western blot or immunofluorescence assay (IFA) test⁴. However, necessary peripartum interventions to reduce the risk for perinatal transmission might need to be based on the preliminary results of rapid testing at labor and delivery. Decisions regarding use of antiretroviral drugs to prevent perinatal transmission among

women who are repeatedly reactive on a single rapid HIV test require clinical judgement regarding initiation of prophylactic treatment before results of a confirmatory test are available. In studies conducted outside the United States, specific combinations of two or more different screening assays provided results as reliable as those from the conventional EIA/Western blot combination. As additional rapid assays become licensed and available in the United States, specific combinations of two or more different rapid HIV tests for diagnosis of HIV infection in women who do not receive health care until labor might be useful because combinations of rapid tests have provided results as reliable as those from the EIA/Western blot combination. Until other rapid assays are available, some women who are reactive on a single rapid test might consider prophylactic treatment until HIV infection is ruled out. Confirmatory standard testing should be done after delivery for women with a positive rapid test result⁴.

Mehrotra et al⁸ in their study used two rapid tests and one ELISA test to detect seropositive samples, which were further confirmed by Western blot technique. Out of 1000 antenatal women screened five were found to be seropositive by ELISA testing but after Western blot testing only four were confirmed. In a multicenter study on rapid HIV testing during labor Bultery et al⁹ report 90 percent positive predictive value 100% sensitivity and 99.9% specificity of rapid tests. In their study initially reactive EIAs and rapid tests were repeated in duplicate : specimens with repeatedly reactive EIA or rapid tests were tested using Western blot. Of the 5744 women offered rapid HIV testing there were four false positive rapid test results 11 false positive EIA results and 34 Western blot confirmed HIV positive women while there were no false negative rapid test or EIA result. In our PPTCT center we follow NACO policy to detect HIV status (strategy III)¹. We do not send any positive sample for Western Blot test. However studies conducted by Mehrotra et al⁸ and Bultery et al⁹ showed that there might be a chance of false positive test results on exclusive three rapid test method. We are not sure, whether any of our 35 seropositive women were false positive. So a policy may be adopted in future to detect false positive results by randomly sending rapid test positive sample for Western Blot test.

88.23% (18650/21136) of all antenatal women were tested for HIV and 80% (28/35) of seropositive women returned to collect the test report and for posttest counseling. It is not clear why a large no of women (2496 in 2 years) failed to return for collecting test reports and for posttest counseling. Reasons could be patient perception that she is not at risk, fear of diagnosis, poor awareness and education about HIV and perhaps inadequate emphasis on the posttest counseling visit during pretest counseling⁵.

National AIDS Control Organization of India (NACO) declared that the country experienced 72,000 new HIV infections in 2005; nearly triple the 28,000 new cases in 2004. The new data means overall infections grew by 1.4 percent¹⁰. Shyamala et al¹¹ from south west India compiled year wise detection of seropositive cases, and showed a rising trend in antenatal clinics from 0.2% in 1997 to 1.4% in 2001. On the other hand, a reduction of more than a third in HIV-1 prevalence in 2000-04 in young women in south India has been reported. The authors concluded that this fall is probably due to rising condom use by men and female sex workers in south India reducing transmission to wives. Prevalence in the north, however, was about a fifth of that in the south, with no significant decreases or increases in 2000-04¹².

The seroprevalence rate of HIV infection in our study was low and found to be 0.1% (10/9426) and 0.2% (25/12363) in 2004 & 2005 respectively with an overall seroprevalence rate of 0.16%. However there is an increasing trend. To determine actual seroprevalence rate all booked as well as unbooked antenatal women screened for HIV were included. Seroprevalence rate of our study is similar to that in studies conducted among antenatal women in other areas of India viz., Allahabad - 0.4%⁶ and Gujarat 1.09%⁶. Our study shows that the prevalence of HIV infection among antenatal women has not reached to an alarming state in this part of the country. But this is the time to take actions so that not only mother to child transmission can be prevented but also new infections can be prevented among prospective parents. If we can act properly we will be able to prevent the epidemic. If we fail, the country may face the consequences that is faced by South Africa today where one out of four pregnant woman is infected with HIV.

According to our study majority of seropositive women were from low socioeconomic status. Hindu community, without any addiction but had multiple sex partners of the husband or the woman herself. Majority of seropositive women were not using any contraceptive. Similar observation is made by Mehrotra et al⁸. Principal mode of transmission was heterosexual contact either by husband or wife. Seventeen percent women were commercial sex workers. Thirteen percent of commercial sex workers in Kolkata are infected with HIV¹³. Perry et al¹⁴ in a study conducted in West Indies state that there is no significant difference between seropositive and seronegative women regarding socioeconomic status, residence, and religion but those with higher number of lifetime sex partners are at greater risk of HIV infection.

A three fold strategy is needed to prevent babies from acquiring HIV from their mothers (i) preventing HIV infection among prospective parents (ii) avoiding unwanted

pregnancies among HIV positive women and (iii) preventing the transmission of HIV from HIV positive mothers to their infants during pregnancy, labor, delivery and breast feeding¹⁵. In our study 5 (17.85%) women opted for MTP and 14 delivered in our hospital. All these women and their children received single dose nevirapine prophylaxis. Although there is concern about the drug resistance, single dose nevirapine remains the best choice for preventing MTCT of HIV in areas where medical resources are limited¹⁵.

During postpartum period an HIV infected woman should receive ongoing HIV related medical care, including immune function monitoring, recommended therapy, and prophylaxis for and treatment of opportunistic infections and other HIV related conditions. HIV infected women should receive gynecologic care, including regular Pap smears, reproductive counseling, information on how to prevent sexual and drug related transmission of HIV, and treatment of gynecologic conditions. HIV infected women should be informed of the importance of follow up of children. Children whose HIV status is unknown require early diagnostic testing and prophylactic therapy to prevent *Pneumocystis carinii* pneumonia pending determination of their status. Uninfected children who are exposed to antiretroviral therapy should be assessed for potential shortterm and longterm side effect⁴. Our study reveals, follow up of the mothers the children was limited. The health statuses of the children, who are so far delivered, are not known. In light of the high mortality in all children of HIV-infected women, programs for prevention of MTCT should be monitored not only in terms of HIV transmission avoided but also in terms of child survival¹⁶.

Conclusion

Seroprevalence of HIV infection among antenatal women is low and uptake of interventions aimed at reducing the risk of mother-to-child HIV transmission is high. There is therefore every prospect that the detection of HIV through antenatal testing would result in a decrease in pediatric HIV infection and AIDS.

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