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RESEARCH ARTICLE

Multidrug Regimen for Prevention of Mother-to-child Transmission in Human Immunodeficiency Virus-positive Mothers in India—From Prevention toward Elimination

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ABSTRACT

Objectives: To study the incidence, demographics, and course till delivery of HIV positive women on multidrug regimen for prevention of mother-to-child transmission (PMTCT). To study the efficacy of this regimen, neonatal outcome and human immunodeficiency virus (HIV) status in infants of these women to detect transmission.

Design: Prospective observational study.

Duration: 20 months (01/03/2014–31/10/2015).

Setting: Department of Obstetrics and Gynaecology at a Tertiary Health Care Center in Mumbai, Maharashtra, India.

Population or sample: The HIV-positive antenatal women attending outpatient department (OPD) or admitted in wards.

Sample size: 93.

Materials and methods: All HIV positive pregnant women were, after consent and counseling, started on tenofovir-lamivudine-efavirenz (TLE) regimen for HIV prophylaxis. Those women who were already on ART were continued on the same regimen. Post-delivery syrup nevirapine was given to the baby for 6 weeks.

Main outcome measures: To study transmission of HIV to the baby by testing at 6 weeks, 6 months, 12 months and 18 months.

Results: Of the 93 babies,13 babies were lost to neonatal death and stillbirth. Of the 80 live-born infants, 6 were lost to follow-up. Hence, 74 infants were tested at 6 weeks, 6 months, 12 weeks and 18 months of age.

All the 74 tested babies were seronegative.

Conclusion: The use of multidrug regimen (as per WHO B+), even in resource-limited settings gives astonishing results with no baby found to be seropositive thus showing us the way forward from prevention to elimination.

Keywords: Antenatal, Human immunodeficiency virus, Multidrug regimen, Neonatal outcome, Prevention of mother-to-child transmission.

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INTRODUCTION

The prevalence of HIV in antenatal population in India ranges 0.08–5%. Of the 27 million annual pregnancies, 1.89 lakh occur in HIV positive pregnant women. In the absence of treatment, the risk of vertical transmission of HIV is as high as 20–45%. Mother-to-child transmission of HIV can occur during pregnancy, labor or breastfeeding. Earlier single-dose nevirapine regimen at the onset of labor was used to prevent parent to child transmission of HIV, in accordance with PMTCT guidelines. However, in March 2014, National Aids Control Organization (NACO) adopted the more efficacious multidrug antiretroviral (ARV) regimen in the PMTCT Programme. The recommended first-line regimen for ARV prophylaxis in HIV infected pregnant women is now tenofovir 300 mg+lamivudine 300 mg + efavirenz 600 mg (TLE). In our study, we studied the incidence of seropositive deliveries, demographics, maternal factors, obstetric

complications and course till delivery in seropositive mothers,efficacy of the new triple drug regimen for PMTCT, any side effects of the triple-drug regimen in seropositive mothers and the neonatal outcome and HIV status in infants of HIV positive mothers at JJ Hospital, Mumbai.

MATERIALS AND METHODS

The study was designed to enroll HIV positive pregnant women during the antenatal period and prospectively follow them up to delivery and thereafter for testing of infants for HIV. The enrolment was done at PMTCT center of Department of Obstetrics and Gynaecology of our Institute. The study period was between March 2014 (when the triple-drug regimen was started for PMTCT in India) until October 2015.

After taking informed consent, the patients were counseled and tested for their HIV status. Those who were found to be seropositive for HIV underwent confidential post-test counseling regarding the vertical transmission and importance of their delivery in the PMTCT centers.

An HIV infected pregnant women were initiated on the new triple drug TLE regimen once they registered. Those mothers already on ART for their health were continued on the same regimen. ARV/ART was continued throughout the antenatal period, labour and delivery, breastfeeding and lifelong thereafter. After delivery, the first dose of Nevirapine was given to Infant between 6 hours and 12 hours of delivery and continued for 6 weeks.

A detailed performa was prepared to obtain the maternal data which included information on demographics, socioeconomic-cultural factors, obstetric history, history of a spouse, testing of spouse and previous children, information on ART regimen and opportunistic infections like Kochs. Detailed follow-up during ANC clinics was kept with regular USG and Investigations. Lastly, the mode of delivery and outcome of the baby was noted. Further patients were followed-up for testing of the baby.

Early icnfant diagnosis was done by PCR screening at 6 weeks and 6 months. Confirmation was done by whole blood sampling at 12 months and 18 months. Samples were taken at ICTC center of our institute.

Quantitative and qualitative data were corroborated at the end of the study period and the findings were used to explore the efficacy of triple-drug regimen for PMTCT in seropositive mothers and the possible contributory factors affecting HIV transmission to the baby.

RESULTS

Of the 93 patients, 51 patients were referred from ART center of which 28 patients were on ART and 23 patients were pre-ART. Four patients came directly in labor. The number of patients detected seropositive in our PMTCT Programme was 22 with a prevalence of 0.36% (Table 1).

Out of 93, 34 were in the age group of 26–30, 29 patients in 21–25, 9 patients were teenage pregnancies less than 20-year age, 23 patients were elderly and the mean age was 27 years (Table 2).

Eighty-five of 93 patients studied were housewives. Seven patients were working women, 3 were salaried, 2 were house help and 2 were laborers and 1 was a commercial sex worker (Table 2).

Fifty-one patients were preconceptionally diagnosed as seropositive. Thirty-eight patients were detected to be seropositive during present ANC checkup. Four patients came directly in labor and were detected positive by Spot test (Table 2).

There were four main reasons for HIV testing of seropositive ANC patients. Sixty patients out of 93 were detected Seropositive during screening under PMTCT programme, 38 during present pregnancy and 22 during previous pregnancies. Fourteen patients were detected seropositive while being investigated for other medical conditions. Fifteen patients were detected after the husband was diagnosed as seropositive. Four patients came directly in labor and were detected positive by spot test (Table 2).

Voluntary testing of spouse was done for 88 patients out of which 60 couples were Seroconcordant. Twenty-eight couples were serodiscordant. Out of these 28 couples, 12 patients remarried after the death of the first spouse who was a diagnosed case of HIV (Table 2).

Eighty-nine patients out of 93 were registered/booked cases. Of these, 89 registered patients, 57 were registered outside and referred to our institute for further management. Thirty-two patients were registered under our PMTCT programme. Four patients were unregistered.

Table 1: Prevalence of HIV-positive deliveries in our institute

Period	*March 2014–October 2015*
Total number of deliveries at our institute	4983
Total number of HIV positive detected in our PPTCT Programme	22
Incidence	0.36%

Table 2: Maternal characteristics

Maternal characteristics		*Number*	*Percentage (%)*
Median age		27 years	–
Married		90	96.8
Education	Illiterate	38	40.9
	Primary	29	31.2
	Secondary	20	21.5
	Graduate	6	6.4
Socioeconomic class	Lower	40	43
	Upper lower	29	31.2
	Lower middle	18	19.3
	Upper middle	6	6.5
Parity	Primi	34	36.5
	G2	23	24.7
	G3	27	29.1
	>G3	9	9.7
Weight	≤40	33	35.5
	41–50	30	32.2
	51–60	21	22.6
	61–70	8	8.6
	>70	1	1.1
Hemoglobin	<7	8	8.6
	7–9	51	54.8
	9–11	30	32.3
	>11	4	4.3
Time of HIV detection	Preconception	51	54.8
	Anc-present pregnancy	38	40.9
	In labor	4	4.3
Cd4 count	<200	4	4.3
	201–350	24	25.8
	351–500	10	10.8
	>500	55	59.1
Time of ANC registration	≤12 weeks	21	23.6
	13–28 weeks	36	40.5
	28–35 weeks	24	26.9
	>35 weeks	8	9.0
No. of ANC visits	<3	12	13.5
	4–8	59	66.3
	>8	18	20.2
Obstetric complications	Oligohydramnios (AFI <5)	9	9.7
	IUGR	6	6.5
	Preterm	6	6.5
	PIH	3	3.2
	GDM	1	1.1
Mode of delivery	Vaginal delivery	64	68.8
	LSCS	29	31.2

Twenty-eight patients in the study were already taking ART for their health. Fifteen patients were on ZLN, 9 on TLN, 2 on TLE 1 on ALN and 1 on SLN (Table 3).

Sixty-five patients were started on ARV. Fifty-four were on TLE regimen. Ten patients with exposure to Nevirapine in previous pregnancy were on TL+LPv/Rt. One patient on TLE regimen developed Tenofovir induced abnormal RFT and was shifted to SLE (Table 3).

Table 3: Details of maternal ART/ARV

Details of regimen		*Number of patients*	*Percentage (%)*
ART (28)	ZLN	15	16.1
	TLN	9	9.7
	TLE	2	2.1
	ALN	1	1.1
	SLN	1	1.1
ARV (65)	TLE	54	58
	TLE -->SLE	1	1.1
	TL + LPV/RT		
	(NVP in previous pregnancy)	10	10.8
Total		93	100

T= Tenofovir L= Tamivudine E= Efavirenz
LPv = LOPINAVIR S = STAVUDINE Z = ZIDOVUDINE

Five patients received triple-drug treatment for less than 1 month. Forty-two patients received treatment for more than 7 months of which 24 received it for >9 months. Four patients that were received directly in labor received a single dose of TLE in labor. Five out of 28 patients on ART developed Zidovudine-induced anemia and in 2 such patients, the regimen was changed.

Out of 65 patients on ARV-TLE regimen, one patient had deranged RFT's hence, was shifted to SLE (Table 3).

Out of 93 patients studied, there were 90 live births and 3 stillbirths, 71 of which were with mother and 19 were admitted in NICU of which 9 were discharged, and 10 were NND. Four out of these 9 were low birth weight, 3 had congenital anomalies–fetal ascites, congenital cyanotic heart disease, and lung hypoplasia. Three babies expired due to meconium aspiration syndrome. Three babies were stillborn, out of which 2 were macerated stillbirths.

Out of 93 babies, 46 babies were low birth weight with weight less than 2.5 kg; of these 3 babies were extremely low birth weight with birth weight less than 1.5 kg.

A total number of babies breastfed out of 80 live borns was 60 (75%). 20 (25%) babies were top-fed.

Out of 80 live babies, 6 patients were lost to follow-up despite repeated counseling (Table 4).

All infants were followed up at 6 weeks and again at 6 months when DBS or dried blood spot samples were taken at ICTC of our institution for DNA PCR testing. Out of 80 live born babies (13 babies were NND/MSB/FSB), 74 babies were tested at 6 weeks, 6 months, 12 months and 18 months. All 74 babies tested negative for HIV (Table 5).

Table 4: Outcome of baby

Outcome		*Number of patients*	*Percentage (%)*
Live births	With mother	71	76.3
	NICU	19	20.4
Total live births		90	97
Stillbirth		3	3

DISCUSSION

A number of patients detected seropositive in our PMTCT Programme were 22 with HIV detection rate of 0.36%. However, the overall delivery rate was higher as many patients were referred to us for ART and further management. The incidence of seropositivity among ANC attendees was 0.35% as per the NACO Annual Report,[1] 0.62% as per Goswami et al.,[2] and 0.53% as per Dash et al.[3]

In our study, the maximum number of patients (54.8%) were in the age group 25–34 years. Similarly, in studies by Goswami et al.,[2], Berhan et al.,[4] and Omondi et al.,[5] maximum patients were in the age group 25–34 years—42.71%, 59.9%, and 64.8%, respectively.

The majority of women living with HIV are in their reproductive years (aged 15–45 years) and heterosexual transmission from male partners is the most common route of transmission of HIV. Effective ARV therapy has led to an improvement in the quality of life and life expectancy. A high HIV prevalence in this age group is a financial burden and loss of productivity for the nation, as it is the most productive age group. Hence, interventions targeting this age-group are needed to eliminate PMTCT.

In our study, 40.9% of the patients were illiterate, 31.2% had primary education while only 6.4% were graduates. As was in a study by Saha et al. in 2012 in India, 75% of patients were illiterate or primary educated.[6] A higher illiteracy rate in our study was because most patients came from low socioeconomic strata with minimal access to education. There is a direct relationship between illiteracy and HIV/AIDS vulnerability. Illiterate women are vulnerable to HIV/AIDS through their inability to read and write or acquire adequate knowledge for protecting herself from STDs including HIV/AIDS.

Socioeconomic status was determined in our study by modified Kuppuswamy's scale. Accordingly, 74.2% of cases came from a lower socioeconomic class. In the Kesho Bora Randomized Control Trial, 56.5% of patients belonged to the lower income group.[7] Kwatra et al. in their study on seropositive women concluded that 77.93% of patients came from the lower socioeconomic strata.[8] Poverty increases biological susceptibility to HIV/AIDS and is associated with illiteracy in a primarily patriarchal society like India.

In our study, of the 93 patients studied 80.7% of patients were married and 16.1% of patients were remarried. About 2.1% of patients were recently widowed, conceived before the husband's death and 1.1% were separated. There was no unmarried patient. As per Darak et al. 58.8% of the study population were married, 37.8% were widowed, and 3.4% were separated/divorced.[9] The majority of HIV-infected women in our study did not give a history of having multiple partners, intravenous drug use or blood transfusions, and appear to have been infected with HIV through monogamous sex with their HIV-infected husbands. Social norms regarding arranged marriages and a patriarchal society, stop women from protecting themselves due to ignorance and lack of social support, for example asking husbands to use barrier contraception.

In our study, 36.5% of patients were primi, 53.8% being second/third gravida. However, 9.7% of the patients were more than gravida 3. Similar to Goswami et al. where 44.66% of patients were primigravidae, 41.99 and were the second gravida and 13.34% were gravida 3 and above.[2] Also as per Kwatra et al.,[8] 43.44% seropositive mothers were primi, 43.44% gravida 2 and 13.09% were

Table 5: HIV testing of babies

S. No.	*Author/Study*	*Regime*	*Transmission (%)*
1.	PACTG 06[22]	AZT from 14 weeks	8.3
		2 mg/kg iv during labor	
		2 mg/kg oral qid to baby x 4 week	
2.	HIV NET 012[26]	Intrapartum and neonatal nevirapine (SD)	10.4
		Zidovudine	8.2
3.	Kesho Bora study[30]	Triple drug regimen	3.3 (6 weeks)
		Zidovudine + SD nevirapine	5% (6 weeks)
4.	Mma Bana[105]	ZLA BD 26–34 weeks (Trizivir)	0.53
		ZL + Lp/Rt BD 26–34 weeks till 6 M postpartum	0.17
5.	Il Okafor et al.[106]	Triple drug regimen (HAART)	No babies tested positive
6.	Present study	Triple drug regimen- TLE	No babies tested positive (74 tested)

more than Gravida 3.79 Familial obligations, inability to terminate the pregnancy, social pressures like the stigma of infertility, ensuring lineage continuity appears to be important for continuing the repeat pregnancies in seropositive women. Hence, despite high contraceptive use by HIV-positive women, pregnancies still occurred.

In our study, the mean maternal weight at registration was 46.5 kg which was less than that see in the study by Ndirangu et al.[10] in 2012 where mean weight was 61.8 kg and in the study by Kayira et al.[11] it was 57.7 kg. Low maternal weight is a marker of low maternal nutrient reserves as HIV severely effects nutritional status causing wasting and poor socioeconomic status of patients.

In our study, 54.84% of patients had hemoglobin in the range of 7–9 g%, 8.60% of patients had severe anemia with Hb <7g%. As per studies by Ezechi et al.,[12] Delva et al.[13] and Ashtagi et al.[14] the incidence of severe Anemia was 3.6%, 10%, and 16.92%, respectively. Maternal anemia, diagnosed at first antenatal visit, was associated with a low reserve, inadequate weight gain, increases the risks of preterm delivery and low birth weight

As regards the time of HIV detection, 40.9% of patients in our study were detected seropositive in the present pregnancy while 54.8% of patients diagnosed preconceptionally. Of these, 23.6% of patients were diagnosed during previous pregnancies as a part of the PMTCT Programme. Hence, 64.5% of the total cases were detected due to the reach of the PMTCT Programme. Similar to the study by IlariaIzowhere 43.1% of patients were detected during present pregnancy whereas 53.9% were detected preconceptionally.[15] Since antenatal clinics sometimes are a woman's first point of contact with the health care system, HIV testing integrated in such clinics is the main reason for detection of HIV positive status in women who would not otherwise get tested and provides us with an opportunity to initiate her into a continuum of care wherein, ARV/ART is given to her throughout pregnancy, labor, delivery, breastfeeding, and infant prophylaxis.

About 64.5% of the couples in our study were seroconcordant, and 30.1% were serodiscordant. Out of these, serodiscordant couples, 12.9% of patients remarried after the death of the first spouse who was a diagnosed case of HIV. This was similar to the study by Darak et al., where 79.4% of couples were seroconcordant and 7.7% serodiscordant.[9] Similar results were found a study by Meyers et al. where 43% pregnancies were between seroconcordant couples, 55.2% between serodiscordant couples.[16] In our study, 30.1% serodiscordance can be explained on the basis of the fact that in many partners who are recently tested may be in the window period of HIV and hence, will test negative. The coexistence of various biological cal factors along with the social scenario explains this situation. For example, 12 seropositive mothers who were earlier in seroconcordant relationships, remarried after the death of a spouse who was a known case of HIV, due to societal pressures and were in serodiscordant relationships during second marriage. Because of the stigma associated with HIV, there may also be non-disclosure of seropositive status leading to more serodiscordant relationships.

In our study, 4.30% patients had a CD4 count of < 200, 25.8% had a CD4 count of 200–350, 10.8% had a CD4 count of 350–500 and 59.1% patients had CD4 count >500. Similarly in the study by IlariaIzo et al.,[15] where 2.8% of the study population had CD4 counts <200, 27.8% between 200–350, 25% between 350–500 and 44% had >500.88 In the ANRS French Perinatal Cohort,[17] 10.2% patients reported CD4 count <200, 22.2% between 200–350 and 67.7% >350.91 plasma viremia as illustrated by CD4 count is an important marker of disease progression and immune status of patients in HIV. Women with CD4 counts less than 350 are started on ART and when such women conceive and ART has continued the risk of transmission to fetus becomes minimal.

In our study, 23.6% of patients registered in the first trimester, 41.57% of patients registered in 41.6% and 34.8% in the third trimester. Similar findings were observed in the ANRS French Perinatal Cohort[17] in 2004 with 10.4% patients registering in the first trimester, 42% registered in the second trimester and 47.56% in the third trimester. and the Elsabe du Plessis study[18] with 11.7% of patients having first ANC visits in the first trimester, 51.5% in the second trimester and 36.8% in the third trimester. Early antenatal registration is related with the reduction of perinatal morbidity and mortality for seropositive mothers. For those women who were not already on ART, the first ANC visit determined when ARV was started for the patient. Those patients who reported late in pregnancy, the total duration of ARV received was less than those who reported earlier, thereby increasing the chances of vertical transmission.

Majority of the patients in our study (66.3%) had 4–8 ANC visits, 13.5% of patients had less than 4 ANC. Four-patients came directly in labor. In the study by Aishat et al. 16.4% of patients had less than 3 ANC visits, majority patients that is 52.7% had 4–8 ANC.[19] A high percentage of seropositive women following up regularly in ANC clinic reflects effective counseling services provided under the PMTCT Programme, showing an inclination towards health seeking behavior among this population. This has a significant effect on preventing mother to child transmission as women who regularly attend ANC clinic will also be more complaint with ART/ARV medications, minimizing vertical transmission.

In our study, we found that 30.1% of patients were already on ART whereas 69.9% of patients were on ARV. Hence, a large number of patients were started on a

triple-drug regimen as a result of the new PMTCT Programme, minimizing the risk of transmission significantly. In the study conducted by Berhan et al. in Ethiopia, it was found that 63.4% of the population was on ART whereas 30.3% were on ARV.[4]

In our study, 1 patient developed tenofovir induced Nephritis and hence her regimen had to be changed. Five patients who were already on ART developed zidovudine-induced anemia, and hence their regimen was changed to a tenofovir-based regimen. As per the study by Gallant et al., on the safety of tenofovir-based regimens, it was found that two patients out of 299 had ARF and 2 patients had a rash.[20] Our study, hence indicates that TLE appears to be generally safe for HIV infected pregnant women.

In our study, 68.8% of patients delivered vaginally while 31.2% were delivered by LSCS. All cesarean sections were done for obstetric indications. This was similar to the study by Thorne et al. where 63.56% of patients delivered vaginally whereas 36.44% of patients delivered via cesarean section.[21] and in a study by Lussiana et al. where 69.2% of patients delivered by vaginal delivery whereas 30.8% by cesarean section.[22] Earlier, it was observed that elective cesarean-section significantly lowered the risk of mother-to-child transmission of HIV-1 infection without a significantly increased risk of complications for the mother.[23] However, in the era of triple-drug therapy, vaginal birth has once more become the safer option for seropositive women to deliver, with minimal risk of transmission.

In our study, preterm birth was seen in 6.45% patients, PIH was seen in 3.22% patients, 6.45% patients reported intrauterine growth restriction (IUGR), premature rupture of membranes (PROM) was present in 6.45% patients and gestational diabetes mellitus (GDM) was present in 1.07% patients. Increased incidence of IUGR and low birth weight may be associated with a damaged immune system and immunosuppression seen in HIV. Obstetric complications per se are not increased in pregnancies in HIV positive women. However, the management of complications such as PROM may be altered, as increased duration of membrane rupture and Prematurity are risk factors for transmission of HIV.

Out of 93 patients studied, there were 90 live births and 3 stillbirths. Out of living born babies, 19 were admitted in NICU. Out of 19 babies admitted in NICU, 9 were successfully discharged. Ten babies admitted in NICU expired in the neonatal period. 4 out of the 9 Neonatal deaths were low birth weight, 3 had congenital anomalies–fetal ascites, congenital cyanotic heart disease, and Lung hypoplasia. Three babies expired due to meconium aspiration syndrome. Hence, out of 93 babies delivered, 80 babies had a successful outcome and went home with mother. HIV-infected women, particularly those with advanced disease, may have higher rates of pregnancy loss (miscarriage and stillbirth) and neonatal mortality than uninfected women. Excess neonatal mortality in HIV-infected women may be associated with low birth weight and prematurity.

In our study, out of 93 babies delivered, 49.4% were Low birth weight with weight less than 2.5 kg out of which 3.23% were extremely lo w birth weight with birth weight less than 1.5 kg. In the study by Leroy et al., it was found that out of a total number of infants of Seropositive mothers, 25.5% were low birth weight.[23] More number of low birth weight babies in our study can be explained due to factors such as low socioeconomic background, poor prepregnancy nutrition, immunosuppression, the possibility of coinfection with TB.

With the advent of triple-drug regimens for PMTCT, the scenario of infant feeding practices has transformed, with exclusive breastfeeding becoming the standard of care for infants. This is especially important in the context of developing countries and resource-poor settings where breastmilk is an important source of nutrition for the baby. In the present study, 72.16% of babies were breastfed whereas 27.84% were top fed. Similarly, in the study by Aishat et al. in 2012 61% babies were breastfed whereas 26% were top fed[19] and Muluye et al. where 83.8% patients exclusively breastfed their babies, 10.5% were top fed.[24]

Transmission of HIV Infection

In the PACTG 06 trial conducted to compare the efficacy of zidovudine given from 14 weeks of pregnancy f/b 2 mg/kg during labor and 2 mg/kg qid to baby for 4 weeks it was found that the risk for transmission to the baby was 8.3%.[25]

In the HIVNET 012 trial, Intrapartum and neonatal single-dose nevirapine were compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda.[26] The estimated risks of transmission in the zidovudine and nevirapine groups were: 10.4% and 8.2%.

In the Kesho Bora study, triple ARV therapy was compared with zidovudine and single-dose nevirapine prophylaxis during pregnancy and breastfeeding.[7] The rate of HIV transmission at 6 weeks was 3.3% (95% CI 1.9–5.6%) in the triple ARV group and 5.0% (3.3–7.7%) in the zidovudine and single-dose nevirapine group.

In the Mma Bana study, comparing the efficacy of two different triple-drug regimens, in the group receiving zidovudine, abacavir, and lamivudine, the transmission was 0.53% whereas in the group receiving ZL +LP/RT it was 0.17%.[27]

In the II Okafor study in 2009 in Nigeria, babies were given TLE regimen and no babies tested positive, of the 182 babies tested.[28]

We found similar results in our study, 74 infants were followed up (6 lost to follow-up) and again at 6 months, 12 months and 18 months at ICTC of our institution. Out of 80 live born babies (13 babies were NND/MSB/FSB), 74 babies were tested and 6 patients were lost to follow-up. All 74 babies tested negative for HIV.

In conclusion, none of the babies tested in our study were found positive for HIV.

CONCLUSION

Mother-to-child transmission is the predominant way children become infected with HIV worldwide. The prevention of mother-to-child transmission has been the major tool to identify HIV-infected pregnant women by voluntary counseling and testing for HIV and then provide ARV drug prophylaxis to them during delivery and then to their newborn infants.

In our study, the use of the WHO B+ triple-drug regimen led us to astonishing results. None of the 74 babies tested positive. This marks a significant shift from previous nevirapine-based studies. where 16 babies out of every 100 potentially tested positive.

Healthier mothers taking a triple-drug regimen means healthier babies and happy families. Life long ART to the pregnant woman also means a better quality of life for the mother and the child.

Clearly, option B plus and triple-drug therapy adopted by the govenment of India to provide lifelong ART to prevent parent to child Transmission of HIV is providing us with results that will make the transmission of HIV to the generation of tomorrow negligible.

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