



EVALUATION OF FETO-MATERNAL OUTCOME IN HIV REACTIVE PATIENTS

Obstetrics & Gynaecology

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ABSTRACT

Background: HIV infection and its treatment can affect maternal and fetal outcomes. Hence the present study was undertaken to evaluate the maternal and fetal outcomes in HIV reactive patients. **Method:** This retro-prospective observational study was conducted in 80 HIV reactive patients in the Department of Gynaecology and Obstetrics at Tertiary Care Referral Hospital. **Results:** Age of the largest group of HIV reactive patients were between 26-30 years (43.75%) and most of the patients were multigravidae with previous FTND (48.75%). 41.8% of the HIV positive women in the cohort had the spouse infected with HIV. All the patients at this institute have undergone pre and posttest counseling. 60% of patients were delivered vaginally. The most common indication for LSCS was meconium stained amniotic fluid indicative of fetal distress. The incidence of preterm labor was 15%, low birth weight babies were 54.5% and 66.7% of the cohort opted for top feeding. There were 11 NICU admissions, one baby was stillbirth and 7 patients had lost to follow up. One maternal and two neonatal mortalities were reported. **Conclusion:** HIV infection increases the risk of adverse foetal outcome in terms of intrauterine demise, still birth and preterm labour. Better patient education will probably lead to earlier diagnosis and initiation of therapy to prevent transmission, and also to better fetal and infant outcomes.

KEYWORDS

HIV infection, Maternal and Fetal Outcomes, Multigravidae, Preterm, Stillbirth, Mortality

INTRODUCTION

Human Immunodeficiency Virus (HIV) is a *Lentivirus* belonging to *Retroviridae* family. It is a positive sense, single stranded, RNA virus. The two main types of HIV viruses discovered are HIV-1 and HIV-2. The viruses are more or less similar in morphology and the way of replication in the host while the difference lies in the infectivity of the virus subgroups. HIV-1 has a greater infectivity and virulence as compared to HIV-2. As a result of which HIV-2 infection is predominant in West Africa while the spread of HIV-1 is global [1].

Transmission of the infection is most commonly via anal penetrative intercourse, followed by vaginal intercourse. Being born to HIV infected mother, receiving blood transfusions and use of intravenous drugs, sharing needles, syringes, are known causes the transmission of the virus. However the most common cause of pediatric infection with HIV is vertical transmission from mother to child. The vertical transmission can occur during antenatal life of fetus, in-utero, during delivery that is intrapartum and after delivery, during breast-feeding. HIV infection in pregnancy can range from being undetected on routine blood tests (window period) to full-blown AIDS, causing maternal morbidity progressing to maternal and perinatal mortality due to fulminant infection [2].

In India, National AIDS Control Organization (NACO) [3] has launched a Prevention of Parent to Child Transmission (PPTCT) programme in 2002 which has around fifteen thousand Integrated Counseling and Testing Centers (ICTC) which offer PPTCT services to pregnant women. India is in the Phase IV of National AIDS Control Programme (NACP) [4]. While a lot of ongoing research and study is going on about taking steps in prevention of vertical transmission of HIV infection, present study was focused on the evaluation of maternal and immediate fetal outcome in patients already infected with HIV.

MATERIALS AND METHODS

After obtaining Institutional Ethical Committee approval and written informed consent from all the patients, this retro-prospective observational study was conducted in the Department of Gynaecology and Obstetrics in Tertiary Care Referral Hospital. All pregnant patients diagnosed as HIV Reactive for HIV 1 or 2 registered at this tertiary care referral hospital, HIV Reactive patients diagnosed for the first time during labor (unregistered patients), diagnosed in post-natal period during post-natal care on an average of 3-4 days and all HIV Reactive patients registered at hospital other than the institution where this study was conducted but delivering at this institution were included in the study. Those patients not consenting for the study, patients reactive on first Comb AIDS test, but negative on second SD Bioline and third Signal HIV tests (as these patients are considered HIV negative) were excluded from the study.

In case of registered patients, Ante-Natal Care (ANC) registration at the institute where this study has taken place comprised of pre-test counseling for testing for HIV, consent was obtained for drawing blood samples for testing HIV. Hemoglobin was checked by pin prick Sahli's Hemoglobinometer. Blood samples were collected for VDRL and HIV testing. Blood pressure was checked and the patient was examined. During next visit the report of HIV testing was made available only to the patient, maintaining the confidentiality. The patients who were tested positive for HIV were then counseled in a post-test counseling session about the progression of infection, risk of opportunistic, urinary and reproductive tract infections, risk of preterm labor. The patients were also explained about the need for starting ART, the risk of mother to child transmission and impact of ART on reduction in maternal to child transmission. Patients were also counseled about the risk and benefit of breast-feeding versus top feeding according to their disease status and socio-economic capabilities in feeding the baby. The patients who were tested positive were encouraged to register at (ART) Anti-Retroviral Therapy centers to procure free ART drugs from these centers. The ART centers perform CD4 counts for the patients on a six monthly basis. The ART centers also perform Liver and Renal Function Tests to rule out the hepato- and nephrotoxicity induced by ART drugs. The patients were closely followed up during the antenatal period. They were advised to take routine hematinics and calcium supplements for treating pre-existing or avoiding the development of anemia. The patients were explained about the course of their disease and the risk of infection to partner (if not infected already). Patients who were not registered at this concerned institute where the study has taken place, but were referred for management were treated in a similar way. It is confirmed if the patient had a post-test counseling and the patient's knowledge about the disease was assessed. Then they were appropriately counseled.

Patients who were HIV reactive, seen in labor were admitted. Care was taken to perform as less number of internal pelvic examinations as possible. Delayed amniotomy was done. All patients were given vaginal trial of labor except those who do not want a trial of labor. Routinely antibiotics were given only after delivery while suturing of episiotomies and prior when the patient goes for LSCS (Lower Segment Caesarean Section). The patient continues to take her routine ART even during labor. The practice of giving single dose Nevirapine during labor is now obsolete.

The mode of delivery, the requirement for need of LSCS, instrumental deliveries and the course of progress of labor were studied. The immediate neonatal outcome and need for Neonatal intensive care unit (NICU) stay was noted. All the babies were administered with syrup Nevirapine stat dose and continued till six weeks and then Tab. Clotrimoxazole was started. The baby weight, apgar score and sex of the baby were noted. The family's choice as to opting for breast-

feeding or top feeding with respect to the demographic and socio-economic factors was studied. The puerperium was observed for any complications fever spikes or development of any other puerperal complications during her stay in the hospital and while following up in the dedicated Post Natal Care (PNC) OPD which was specially conducted on every second and fourth Wednesday of every month. The immediate previous pregnancies were also studied, with respect to history of infection in previous pregnancy, any unwanted pregnancies, infection of previous baby, history of top feeding or breast-feeding the previous baby was studied. Also the mode of delivery in previous baby was noted.

STATISTICAL ANALYSIS

The simple statistical calculations were performed, using percentages and descriptive statistics. The results were tabulated and put on figures for easier depiction purposes.

RESULTS AND OBSERVATIONS

Number of deliveries during the study period in the hospital was 11,621. Out of which 84 pregnant patients had delivered at the institute where the study was done, of them two patients did not fit the inclusion criteria- did not give consent, one patient was a maternal mortality because of AIDS and the fourth patient developed post-partum psychosis that could not be taken into the study, as she was not able to give a valid consent. So this case study was performed on 80 patients and most of them belong to age group of 26-30 years (43.75%). Other socio-demographic characteristics of the mothers are shown in table 1.

Table 1: Socio-Demographic characteristics of the mothers

Parameters	No. of Patients	Percentage
Age group (Years)	19-20	09
	21-25	22
	26-30	35
	31-35	12
	>35	02
Educational Status	Illiterate	17
	Primary	07
	Secondary School	45
	Graduate	11
Social Class	I	07
	II	11
	III	44
	IV	18
Marital status	Married	77
	Unmarried	02
	Widow	01
Maternal Occupation	House Wife	73
	Accountant/ Beautician/ Domestic Maid/ News Reporter/ Street Vendor/ Student/ worker	1 patient each
Serostatus of spouse	Reactive	33
	Non-reactive	24
	Not tested	21
	Unknown	02
Registration Status	Registered	60
	Referred	17
	Unregistered	03
Time of registration	Up to 20 weeks	45
	21-30 weeks	25
	>30.1 weeks	10
Number of ANC/ ART Centre Visits	Number of visits	ANC visits
	0 to 3	13 (16.25%)
	4 to 6	15 (18.75%)
	7 to 9	20 (25%)
	10 to 12	22 (27.50%)
ART Centre Visits	ART Centre Visits	
	0 to 3	13 (16.25%)
	4 to 6	15 (18.75%)
	7 to 9	20 (25%)
	10 to 12	22 (27.50%)
	13 to 16	09 (11.25%)

Medical co-morbidities in association with HIV reactive status are shown in figure 1.

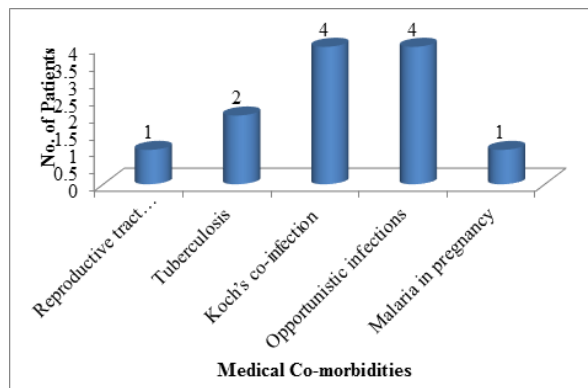


Figure 1: Medical co-morbidities in association with HIV reactive status

A majority of patients were multigravidae with previous vaginal deliveries amounting to 48.75% followed by primigravidae (40%). Most of the patients had undergone 2-3 pelvic examinations (47.50%). 37.55% of mother received antibiotics during their labor and other obstetric history were shown in table 2.

Table 2: Obstetric characteristics and history of the mothers

Parameters	No. of Patients	Percentage
Parity	Primigravidae	32
	G2A1 & G3A2	06
	Multigravidae with previous FTND	39
	Multigravidae with previous LSCS	03
Number of Internal Examinations	0 to 1	05
	2 to 3	38
	4 to 5	24
	6 to 7	09
	8 to 10	04
Antibiotics during labor	Yes	30
	No	50
HIV Reactive Status in previous pregnancy	Yes	35
	No	12
	NA	32
	unknown	01
Previous child affected with HIV	Yes	12
	No	23
	unknown	03
	Not applicable	42

PROM (Premature Rupture of Membranes), PPROM (Preterm Premature Rupture Of Membranes)

The maximum number of patients had CD4 counts between the ranges of 350 to 499 amounting to 30% of the study population followed by >500 (26.25%) as shown in Figure 2.

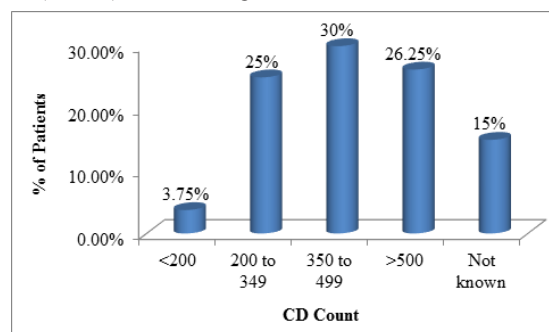


Figure 2: CD4 Count in mothers in HIV positive

Maximum number of patients was delivered vaginally with a 60% vaginal birth rate and 29% of the patients had undergone an LSCS.

Indication for LSCS was depicted in figure 3. Most of the patients had undergone a labor course of 4-5 hours in their 1st stage of labor (25%) while up to 10 minutes in their second stage of labor (22.5%). The maximum number of patients (85%) had gone up to full term and delivered after 37 weeks of gestation (80%). 9 patients have PROM and seven patients developed PPROM. The maximum patients had an uneventful stay in the hospital, with an uneventful puerperium as shown in table 3.

Table 3: Obstetric outcome

Parameters		No. of Patients	Percentage	
Mode of Delivery	FT breech delivery	01	1	
	FTND	48	60	
	PTVD	08	10	
	LSCS	23	29	
Duration of labor	1st stage (Hrs)	1 to 3	13	16.25
		4 to 6	20	25.0
		7 to 10	12	15.0
		11 to 16	09	11.25
		Not monitored	03	3.75
		NA	23	28.75
	2nd stage (minutes)	Up to 10	18	22.5
		11 to 20	11	13.75
		21 to 30	10	12.5
		31 to 40	09	11.25
		41 to 60	06	8.5
		NA	26	32.5
Preterm Labor	Yes	12	15	
	No	68	85	
Gestational age at delivery	28 to 33.6 weeks	7	8.75	
	34 to 36.6 weeks	9	11.25	
	37 to 39.6 weeks	49	61.25	
	More than 40	15	18.75	
PROM	Yes	09	11.2	
	No	71	88.8	
PPROM	Yes	07	8.8	
	No	73	91.2	
Puerperium event	Blood Transfusion	04	5	
	Psoas Abscess	01	1.2	
	Thrombophlebitis requiring fasciotomy	01	1.2	
	Puerperial Tubal Ligation	01	1.2	
	Uneventful	73	91.2	

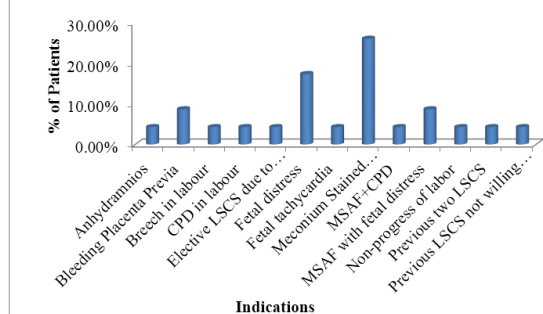


Figure 3: Indication for LSCS

Out of 80 patients, one patient delivered twins, amounting to 81 babies, out of which 40 were males and 41 were females. The maximum weight distribution of the babies was among the birth weight of 2.7 to 2.9 kg (25%). The majority of babies born had the Apgar score of 9 (93.9%). Eleven babies required NICU admission. One baby was stillbirth hence feeding option was not applicable. 66.7% of patients opted for top feeding and 32% of patients opted for breast-feeding. Syrup Nevirapine was administered to all babies except the one still born baby. Seven patients had lost to follow-up; two were neonatal deaths and one stillbirth, so rests of the 70 babies were administered with Syp. Nevirapine up to six weeks post-partum, and Tab. Clotrimoxazole after six weeks, (Table 4).

Table 4: Neonatal outcomes among women who are HIV reactive

Parameters		No. of Patients	Percentage
Birth Weight (kgs)	0 to 1	01	1
	1 to 1.9	13	16.25
	2 to 2.3	14	17.25
	2.4 to 2.6	16	20.0
	2.7 to 2.9	20	25.0
Sex of the baby	3 to 3.5	17	21.25
	Female	41	50.6
Apgar score	Male	40	49.4
	0	01	1.2
	3	01	1.2
	5	02	2.5
	7	01	1.2
NICU Admission	9	76	93.9
	Yes	11	13.6
Breastfeeding	No	70	86.4
	NA	01	1.3
	Yes	26	32
Top feeding	No	26	32
	NA	01	1.3
	Yes	54	66.7
Baby administered Syp. Nevirapine up to six weeks and baby on Co-trimoxazole after six weeks	LTFU	07	8.8
	NA	02	2.5
	No	01	1.2
	Yes	70	87.5

Out of 80 patients, 12 patients had an HIV positive baby out of previous birth. Twenty-three patients had a non-infected baby from previous birth. Three mothers had neonatal deaths hence the status of previous births were unknown. Out of the 42 not applicable cases, 3 patients had a previous IUFD, 32 patients were primigravidae, and seven patients had previous abortions. Out of the 12 HIV positive previous babies, 4 were breast-fed and 8 were top-fed. Eleven HIV positive babies were born by vaginal birth and one was born by LSCS.

DISCUSSION

Maternal HIV transmission is the primary means by which infants become infected. Hence prevention of maternal HIV transmission is of paramount importance. In the present study, all the patients were positive for HIV, of them 50% already knew that they were HIV positive who were diagnosed preconceptionally the other 50% came to know about the infection due to routine counseling and HIV check up antenatally. 16.2% of the study group was not compliant to Anti Retroviral Therapy. Patients were compliant to hematinics were 68%, while 15% of the population was non-compliant to hematinics. All patients delivering had received both pre and post test counseling regarding HIV. The age group of HIV infected mother that was the most prevalent was 26-30 years (43.75%) which is comparable with the study done by Goswami et al [5], Joshi et al [6] and Shankar et al [7]. Maximum numbers of patients delivering were married (96.2%) and housewives (91.2%). The husbands of HIV positive mothers were mainly in a salaried job amounting to 65% of the occupational division. 41.8% of the spouses were infected and a huge number of people 21 out of the eighty spouses were not tested for the disease. 75% of patients were registered in the hospital. One unmarried patient was admitted throughout her antenatal course for social reasons. The other 79 women were studied for their follow up with regular ANC course. All these findings are correlated with the study done by Yadav et al [8]. The low socioeconomic status and lack of education were main reason for the lack of awareness of the infection and also for loss of follow ups.

The prevalence of respiratory tract infection (RTI) in overall pregnant women was 1.2%. A study conducted by Mathad et al [9], found that a rate of 0.7-7.9% for presence of active tuberculosis in HIV positive mothers, while in current study, 2.5% mothers had tuberculosis in current pregnancy and as high as 5% of the same study group had tuberculosis in previous pregnancies. The patients on ART had the median CD4 count of 436cells/cu.mm. Increased viral load and hence lower CD4 counts are associated with increased secretion of HIV in cervico-vaginal secretions, amniotic fluid and in breast milk thus increasing the chances of maternal to fetal transmission of the disease [10]. Four patients in our study group had opportunistic infections in the form of, otitis media, genital warts, Herpes Zoster and Lower RTI.

This finding is correlated with the previous studies [11-13]. Only one patient had malaria during pregnancy, and that was relapse of previous P. vivax malaria.

In two separate studies conducted by Merwe et al [14] in South Africa and another by Kim et al [15] in Zambia, it was concluded that pregnant women with CD4 counts of less than 350/cu.mm were at increased risk of prematurity and delivering low birth weight babies. In present study, 15% of the study population had gone into preterm labor, while 8.8% of the study population had PPROM. 34% of the babies were born with low birth weight (<2.5kg). This shows that there's a high level of co-relation between infection with HIV and prematurity.

The labor course should be monitored in HIV reactive patients as to when do the membranes get ruptured, either artificially or spontaneously. In current study, 11.2% of the study population had PROM while 8.8% had PPROM. The incidence of preterm labor was 15% which is comparable with the study Shankar et al [7]. In a case study by Peckham et al [16] it has been proven that elective LSCS causes a reduced risk of vertical transmission in HIV. Although elective LSCS was not the treatment modality of choice for delivering HIV positive patients at the institute where the study was conducted, but in our study, 23 (29%) patients had undergone LSCS. The most common indication for LSCS was meconium stained amniotic fluid indicative of fetal distress. In case instrumentation is required, forceps is preferred over vacuum, because vacuum may cause micro abrasions, which increases the risk of HIV transmission during vaginal birth. Also episiotomies should be avoided in the patients with HIV and should be given only when utterly indicated, as increased maternal blood exposure to the baby causes increased risk of HIV transmission. Out of the 80 exposed babies, 66.7% of the mothers chose formula feeds of the babies while the remaining 32% chose to breast feed the baby which is comparable with the study done by Goswami et al [5]. One maternal and two neonatal mortalities were reported in the duration of the study.

Limitations

1. The difficulty faced during the study, was mainly in convincing the patients about participating in the study. The patients suffering from HIV belonging to the vulnerable group of population were hesitant to show reports, and denied revealing their ART center book for reviewing follow up.
2. Seven patients were lost to follow up. It was difficult to convince them to follow up and bring their babies for a regular follow up.
3. The patients who were referred from different hospitals had a poor follow up and were inadequately counseled about the status of their disease. As a result these patients were confused about the mode of feeding of the babies and required a lot of positive reinforcement about the mode of feeding they have opted for.
4. Since the patients were followed up for only six weeks, effect of continued ART and NVP for baby is not studied. It requires at least 18 month follow up.

CONCLUSION

HIV infection increases the risk of adverse foetal outcome in terms of intrauterine demise, still birth and preterm labour. Social class and educational status play a vital role in establishing a good reasoning and determining the follow-up with ANC OPD and ART centers and compliance to hematinics and ART. The patients were counseled throughout their antenatal period and in the post-natal ward stay, were explained about the risks and benefits of top feeding and breast-feeding comparatively. The patients had also been explained the top feeds should be affordable, feasible, acceptable, sustainable and safe and to opt for it according to the intelligence capacities, after checking for their socio-demographic status, with the level of literacy and understanding of the mother. This also highlights strong parental wish to protect the baby in the light of the fact that vertical transmission can occur during breast-feeding. It only highlights need for handholding throughout this period.

Team approach involving an experienced obstetrician, neonatologist and physician gives hope of having a healthy uninfected baby for HIV infected mothers.

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