

## ORIGINAL ARTICLE

### A PROSPECTIVE STUDY OF OBSTETRIC AND NEW BORN OUTCOME IN A COHORT OF HIV AFFECTED PREGNANT WOMEN

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**ABSTRACT: BACKGROUND:** In India, the HIV prevalence in women of child bearing age is seen where already the risk of maternal and newborn morbidity mortality are high. There is need to investigate the association between maternal HIV infection and adverse pregnancy outcomes so the disease is better address. **OBJECTIVES:** To study the obstetrics and newborn outcome in pregnant women with HIV infection. **METHODOLOGY:** All booked ANC cases that are screened to be HIV positive in one year period are included. History taken, clinical examination is done. Patients are subjected to investigation like ANC investigation and CD4 cell count and obstetrics scan. All the patient will be followed up till term/ delivery and outcome studied. **STATICAL ANALYSIS:** descriptive study and chi-square test. **RESULT:** Maternal HIV infection is associated with incidence of low birth weight in 52.3, pre-term labour in 34.5%, PROM in 30% and IUGR in 20%. These adverse outcomes have an inverse relationship with CD4 count. Lower CD4 count is also associated with increase obstetrics, fetal complication and opportunistic infection. (P<0.05) **CONCLUSION:** maternal HIV infection is associated with increased incidence of adverse obstetrics and newborn outcome have an inverse relation with CD4 count.

**KEYWORDS:** HIV, AIDS, Perinatal outcome, CD4 count.

**INTRODUCTION:** Human immune deficiency virus, HIV is now established as the primary cause of ACQUIRED IMMUNO DEFICIENCY SYNDROME (AIDS). Impact on health care of women, infant and children.

**OBJECTIVES:** to study the prevalence of HIV infection in pregnant women in VANI VILAS HOSPITAL.

**CONCLUSION:** A study evaluates the pregnancy outcome in HIV sero-positive women, comprised of 120 patient and a year study and showed HIV infection adversely affect the pregnancy outcome and significantly associated with higher incidence of IUGR, FETAL COMPLICATION.

**INTRODUCTION:** HIV infection is predominantly transmitted through the sexual route additionally it is transmitted through the parental route that includes blood and shared needles and syringing and mother to child transmission. In order to prevent transmission of HIV infection certain strategies like early and effective treatment of sexually diseased promoting of condom and advocating monogamous relation are being applied world over.

Women have emerged as the fastest growing HIV infected population worldwide, mainly because of increasing hetero sexual transmission. Most infected women are of reproductive age group and the great conserved both for women and the treating physician in the relationship

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between the HIV infection and pregnancy. Whether HIV infection itself may adversely affect pregnancy, remains controversial.<sup>1</sup>

The observation that HIV infection would be transmitted from mother to child was recognized early in the HIV epidemic. Most of these have been concerned with risk of mother to child transmission and the various factors associated with the transmission.<sup>2-4</sup>

In a recent meta-analysis found relatively weak relationship between maternal HIV infection and adverse peri-natal outcome. However studies exclusively from developed countries report no adverse peri-natal outcome.<sup>5</sup>

Spectacular scientific advances have been made in the last few years which have made a significant impact in devising strategies to reduce adverse effect of HIV on pregnancies and to reduce mother to child transmission of HIV infection. The CD4 count has been proven of diagnostic and prognostic value in treating HIV positive pregnant women. So it is practice routinely in our hospital. Women are categories based on CD4 count and are treated with anti-retro viral therapy.<sup>6</sup>

Therefore we formulated this studies a prospective study of obstetrics and new born outcome in cohort of HIV infected pregnant women. This study will help in understanding the effect of HIV on pregnancy, the outcome based on CD4 count and anti-retro viral therapy. These data will be helpful in formulating future guidelines in management of HIV positive pregnant women.

### AIMS AND OBJECTIVES:

- A) To study the prevalence of HIV infection in pregnant women at VANI VILASH HOSPITAL.
- B) To study the obstetrics and new born outcome in these pregnant women with HIV infection.

**EPIDEMIOLOGY:** Karnataka a diverse state in south India has a population of 53 million. HIV prevalence among ante natal clinic attended exceed 1% from 2009 -10 and drop to 0.5 in 2011-12. Prevalence is more in and around Devdasi belt in northern Karnataka:

- The milestone of HIV AIDS epidemic at a glance.
- 1985-86. Indian council of medical research (ICMR) initiated HIV surveillance at specified sites. The first report of HIV infection is sex workers in Chennai and first report of AIDS in Mumbai.
- 1991. National Aids Control Organization (NACO) was established.
- 1992. ICMR established national AIDS research institute (NARI) in Pune.
- 1999. Supreme court ruling made HIV testing of all blood bottles mandatory.
- 2002. Feasibility study for prevention of parent to child transmission of HIV with Zidovudine were initiated by NACO.
- 2003. Indian pharmaceuticals companies marketed anti retro viral drugs with considerable price reduction.
- 2004. Tripartite agreement between NACO(Ministry of Health) ICMR and international AIDS vaccine initiated facilitated HIV vaccine and testing in India.
- 2006. Central government announced the policy of highly active anti retro viral therapy to those who suffer from AIDS.
- Programme implementation begins for phased scale up programme of antiretro viral therapy by NACO. NACO estimates currently 5.1 million persons living in India with HIV.
- AIDS vaccine trial was initiated.

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There is some decrease in CD4 cell during the period of pregnancy and re born time to return to normal appears to be extended for HIV infected women. The picture is however equivocal. The observation is critical in that although they are not directly measuring the outcome of primary interest.

**MANAGEMENT OF HIV POSITIVE PREGNANT WOMEN:** Most of the HIV women will be asymptomatic and have no major obstetrical problems during their pregnancies. They should receive similar ANC as that of HIV negative women unless indicated to receive the HIV related treatment. There is no evident that number of ANC should be increased although they need additional counseling and support as an integral part of the management.

Invasive diagnostic procedure Such as chorionic villous sampling, amniocentesis or culdo centesis should be avoided if possible due to risk of infection to the fetus.

**EXAMINATION AND INVESTIGATION:** HIV positive women should have a full physical examination under first visit. Particular attention should be paid to any sign of HIV related infections particularly tuberculosis, oral or vaginal thrush or lymphadenopathy herpes zoster in a young women is often an early sign of HIV infection and current HERPES lesion or the scars from the previous infection may be found. Other co-existence sexually transmitted disease especially syphilis common in HIV positive women and may increase the risk of transmission and the level of virus in vaginal and cervical secretion. Maternal weight should be monitored and nutritional supplementation advised was necessary. Oropharynx should be examined at each visit for the presence of thrush.

LAB investigation will depend upon the available resources of the health services so a hemoglobin estimation is mandatory and complete blood count should be performed and T-cell subset investigation undertaken were possible. Viral load estimation may provide a valuable prognostic indicator. Cervical smear should be performed.

**COUNCELLING BEFORE AND AFTER HIV TESTING IN PREGNANCY:** Pre and post-test counseling are essential elements of the management of HIV in pregnancies. Pre-test counseling enables women and men to take informed decision about an HIV test. Post-test counseling is an integral part of the management of HIV positive person and provides an important opportunity for risk reduction massages for those found to be HIV negative.

### **Protocol followed in pretest counseling;**

- Take client to private setting for counselling.
- Explained or determined the reason for HIV testing.
- Provide information about HIV/ AIDS.
- Provide information about the HIV antibody test including information window period.
- Provide information about the test procedure.
- Obtain informed consent.

### **PROTOCOL FOLLOWED IN POST TEST COUNSELING:**

- See the client personally to give the result.
- No telephonic result preferably not before a weekend.

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- Give the result as soon as possible after the test is done.
- Identify the person immediate consent.
- Encourage the client to ask more questions.
- Refer for follow up care and counselling.

**ANTI RETROVIRAL THERAPY:** ALL HIV positive women should be refer to the ART center for registration into care and screened for medical eligibility for ART. Once they have been diagnosed in the prevention of parent to child transmission programme. In a pregnant patient with HIV positive should access CD4 count as per national guidelines. These women should be jointly managed at the ART center for HIV/ART aspect and ante natal team for obstetrics concerned.

### WHO CRITERIA FOR ART IN PREGNANCY:

WHO STAGE	CD4 testing not available or result pending	CD4 available
1	Do not treat	Treat if CD4<200cells /mm3
2	Do not treat	
3	Treat	Treat if CD4 <350cells/mm3
4	Treat	Treat irrespective of CD4

**Note:** Consider initiation of ART in asymptomatic HIV infected pregnant women with CD4 count <250 cells/mm3 and initiate before CD4 count drops below 200cells/mm3.

The following are the first line ART regime for pregnant women requiring treatment for her own health. AZT+3TC+NVP.

EFV can be used as a substitute to NVP if there is contraindication like hepatotoxicity, and EFV has got fetal teratogenicity in the first trimester of pregnancy.

ART is recommended for post-partum breast feeding women who meet the medical criteria for the initiation of ART for their own health. The prefer regimes is AZT +3TC+NVP.

The goals in the management of HIV in pregnancies are dual: managing the mothers HIV status and prevention of mother to child transmission. The indicator for ART and drugs selection in pregnancy is similar to those in non-pregnant women.

Good clinical management of HIV in pregnant women requires the support of a multidisciplinary team, including antenatal specialties, pediatricians, counselors, members of ART center and community based organization (NGO, positive network etc).

VIRAL	Viral genotype and phenotype viral resistance viral load.	Risk of transmission more with HIV 1 than with HIV2. Monoclonal macrophage tropic are transferred more than T cell tropic.
MATERNAL	Maternal immunological status Maternal nutrition status Maternal clinical status Behavioral factors	Low CD4 count or advanced disease more risk Risk of transmission is more with high maternal viremia such as at time of seroconversion or advanced disease.

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	Antiretroviral treatment	Associated genital tract infection increase the risk ART during pregnancy and at onset of labour reduce transmission rate.
OBSTETRICS	Prolongs rupture of membrane(>4hours) Mode of delivery Intra partum obstetrical procedure Invasive fetal monitoring	Duration of labour does not affect Transmission risk is doubled with ruptured of membranes>4hours 2% increase transmission with each hour increment. Episiotomy, vaginal tear, chorioamnionitis, abruption placenta, preterm delivery, traumatic deliveries increase the risk.
FETAL	PREMATURITY GENETIC MULTIPLE pregnancy	Prematurity, multiple gestation increase the risk
INFANT	Breast feeding gastrointestinal tract factors immature immune system	

### **MATERIALS AND METHODS:**

**STUDY AREA:** The study was conducted at VANI VILAS HOSPITAL, Bangalore.

**STUDY POPULATION:** All pregnant women attending the ante natal clinic at VANI VILAS HOSPITAL after pre and post-test counseling. HIV infected pregnant women were followed up prospectively till term and delivery.

**STUDY DESIGN:** Hospital based prospective study.

**INCLUSION CRITERIA:** All pregnant women who were HIV positive

**EXCLUSION CRITERIA:** All pregnant women with HIV negative status and pregnant patients with medical disorders of pregnancy.

**SAMPLING METHOD:** Convenience sampling.

**STATICAL ANALYSIS:** SPSS VERSION 16 was used for analyzing the data.

**ANALYTICAL STATSTICS:** Chi square test was used to test the difference in the incidence of obstetrics complication, fetal complication and opportunistic infection in relation to CD4 count.

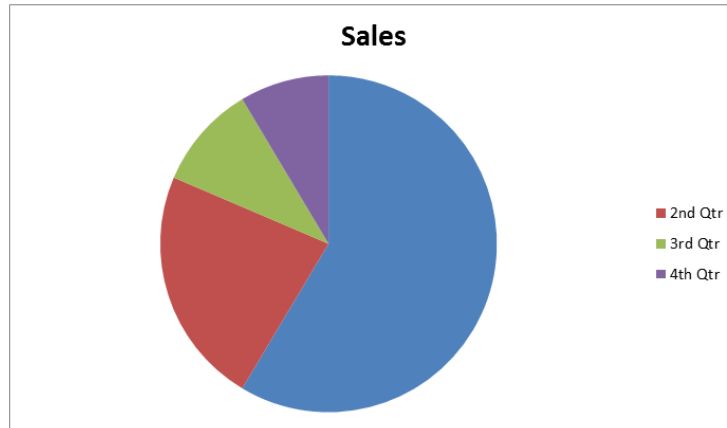
**METHODOLOGY:** All the booked patient who visited VANI VILAS HOSPITAL for ANC clinic HIV testing was done according to NACO guidelines using the rapid test and post-test counseling was done for patient who were sero positive.

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Patient consent is taken, detail history taken, clinical examination was done. If any medical disorders are identified, those patients are excluded.

All the parturients in the study received single dose of tab. NEVIRIPINE 200mg at the onset of labour and the neonates received a single dose Neveripine calculated at 2mg per kg body weight 72 hours of delivery. Some parturients obtained for Elective LSCS as they were aware of the reduced risk of mother to child transmission and their request are accepted.

### OBSERVATIONS AND RESULTS:



**Pie chart depicting age wise distribution of HIV infected women**

EDUCATION	MEN	WOMEN	MEN%	WOMEN%
Illiterate	42	62	35	52
Primary	39	39	33	33
Secondary	23	17	19	14
College	16	02	13	02
<b>Total</b>	<b>120</b>	<b>120</b>		

**EDUCATION OF MEN AND WOMEN**

Occupation of women	No of cases	%
COOLIE	11	9
CSW	02	2%
FACTORY	02	2%
FARMER	04	3%
HW	96	80%
SHOP	3	3%
TEACHER	2	2%
<b>TOTAL</b>	<b>120</b>	

**OCCUPATION OF WOMEN**

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OCCUPATION	NO OF CASES	%
BAR VENDOR	1	1%
BUSINESS	6	5%
CABLE OP	1	1%
CARPENTER	1	1%
CLEANER	1	1%
CLERK	1	1%
COBBLER	1	1%
COOK	1	1%
COOLIE	28	23%
DRIVER	33	28%
FACTORY	9	8%
FARMER	19	16%
HOTEL WAITER	4	3%
MECHANIC	3	3%
PAINTER	2	2%
PAN SHOP	3	3%
SHOP	3	3%
TAILOR	3	3%
<b>TOTAL</b>	<b>120</b>	
<b>OCCUPATION OF MEN</b>		

PRESENCE OF RISK FACTOR	NO OF CASES	%
BLOOD TRANSFUSION	7	6%
SEXUALLY TRANSMITTED	20	17%

HIGH RISK BEHAVIOUR	NO OF CASES	%
SELF	5	4%
HUSBAND	41	34%
BOTH	5	4%
NILL	69	58%
<b>Relationship with other contributing risk factors</b>		

The study shows that 7% women had history of blood transfusion, 17% had an STD, 8% were polygamous whereas 38% of the husbands had multiple sexual partners.

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### Relationship with other contributing risk factors:

IUGR	NO OF CASES	%
PRESENT	22	20
ABSENT	87	80
<b>TOTAL</b>	<b>109</b>	

**INTRA UTERINE GROWTH RESTRICTION**

MODE OF DELIVERY	TOTAL NO OF CASES	%
VAGINAL	89	81.65%
LSCS	20	18.35%
<b>GRAND TOTAL</b>	<b>109</b>	<b>100%</b>

**MODE OF DELIVERY:**

BIRTH WEIGT	
<2.5 Kgs	57 cases
>2.5kgs	52 cases
Minimum	0.7 kg
Maximum	3.75 kg
Mean	2.33 kg
SD	0.65

**BIRTH WEIGHT DETAILS:**

ART	NO OF CASES	%
YES	26	21.6%
NO	94	78.4%
<b>TOTAL</b>	<b>120</b>	

**Anti-Retro viral Therapy:**

CD4 COUNT	POST TERM	PRE TERM	TERM
<199	0(0)	2(40)	3(60)
200-349	1(12.5)	13(35.1)	16(53.3)
>350	7(87.5)	22(59.5)	45(60.8)
<b>TOTAL</b>	<b>8(100)</b>	<b>37(100)</b>	<b>64(100)</b>

**Analysis of pregnancy outcomes in relation to CD4 count:  
CD4 count versus gestational age at birth**

CHI square =2.9 df=4 p=0.574



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It was observed that among those with CD4 count <199, preterm labour was seen to be 5.4%. Among those with CD4 count 200-349 and >350, 35.1% and 59.5% had preterm labour respectively CD4 count vs birth weight.

CD4 COUNT	LOW BIRTH WEIGHT NO	NORMAL WEIGHT	TOTAL
<199	2(40)	3(60)	5(100)
200-349	20(66.7)	10(33.3)	30(100)
>350	35(47.3)	39(52.7)	74(100)

Among those mother with CD4 count <199 we observed 40% had a low birth weight. And those CD4 count 200-349 66.7% had low birth weight.

**DISCUSSION:** In present study 120 HIV seropositive pregnant women were followed prospectively and studied the consequences of maternal HIV infection on pregnancy outcome. The focus for evaluation was mainly antepartum complication in mother pregnancy outcome and newborn outcome.

Almost all the women were in the age group of 17-36 years. Among 65% had married life <4 years. And 34% has < 2 years.

Education status of both women and partner 52% women's are illiterate and husbands 35% are illiterate and 2% pre-university women and 13% had pre-university education in men.

80% women are housewives, 8% working as a coolie with polygamous relationship. Most of their husbands were driver and commercial sex workers. 4% of the husbands had polygamous relation and 23% had ongoing STDs.

In this study among 120 HIV women 2.5% opted for termination of pregnancy 5% had spontaneous abortion 1 had septic abortion 1 patient had ectopic pregnancy. So 110 patients crossed 28 weeks gestation pregnancy followed till delivery.

The incidence of post-partum complication puerperal pyrexia, sepsis, post operated wound infection etc. this was statistically significant with the ( $p$  value < 0.05). It was observed that there is an increase relation between the CD4 count and opportunistic infections (statistically significant < 0.05).

This study a prospective study of obstetrics and newborn outcome in a cohort of HIV infected pregnant women evaluates the pregnancy outcome in HIV sero-positive women. All the antenatal patient attending VANI VILAS hospital were screened for HIV infection for pre and post-test counseling. The HIV infected women were informed about their status and followed till delivery.

The study was done in a one year time comprised of 120 patients. Among that 3 patient opted for termination of pregnancy 7 had spontaneous abortion and 1 patient had ectopic pregnancy so 109 patient were followed till delivery.

In the present study it was observed that most of the sero-positive women were age group 20 to 25 years and married life of 4 years. Most of them are illiterates and housewives and had a monogamous relation.

Only 8% had a polygamous relationship whereas 33% of the spouses were illiterates and 38% had a polygamous relationship with multiple sexual partners. It was observed that husband's occupation plays an important role as one third of them were drivers.

Significant no of women had an associated STD either in the past or the present.

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IUGR was noted in 20% of the fetus born to these HIV infected women as determined by obstetrics ultrasonography and the incidence increase with lower CD4 count ( $P < 0.05$ ) preterm labour was seen in 34.5%. pre-term labour rupture of membranes and associated complications was noted in 30% of the patient and showed the trend of more adverse results with decreasing CD4 count.

Low birth weight was found in as high as 52.3% patients with mean birth weight of 2.33kgs. There were high incidence of still birth rate (4.5%) and intrauterine death rate (4.5%) and have an inversely relation with CD4 count. ( $p < 0.05$ )

Post-partum complication rate was also significantly more with puerperal pyrexia (9%), puerperal sepsis, more so in patient with caesarean section with wound infection rate being 20%.

To conclude maternal HIV infection adversely affects the pregnancy outcome (obstetrics and newborn outcome) and is significantly associated with higher incidence of IUGR, fetal complication and obstetrics complications more so when the CD4 count is less (statistics significant  $p < 0.05$ ). HIV infection is also associated with increased incidence of pre-term labour, PROM, low birth weight and post-partum complication and show the increasing trend as CD4 count decreases.

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