

# Prevalence of Human Immunodeficiency Virus Infection in Pregnant Women and Birth Outcome at Tertiary Care Centre in a North Indian Town

## Research Article

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### Abstract

**Background and objectives:** There are an estimated 2.5 million HIV-infected persons in India. Limited data is available from India on HIV and birth outcomes. Nearly 30% are women of reproductive age who are often diagnosed for the first time during pregnancy. With the prevalence of HIV in the antenatal clinics in many parts of India nearing 1% in 2008, measures to avert neonatal adverse outcomes in this population are important for child survival. The present study was done to determine the prevalence of HIV seropositivity in females attending ANC clinic and to study the birth outcome of HIV positive pregnant females.

**Materials and Methods:** A prospective study was carried out over a period of three years (2011-2013) from. The sample population included 6067 pregnant women registered and counselled at the antenatal clinics of this hospital. All of them were screened for their HIV status and the HIV positive pregnant females were followed up to evaluate the birth outcome.

**Results:** A total of 6067 pregnant females were screened for the presence of HIV in antenatal patients over three year period. Overall positivity rate was found to be 0.41% (25 females). Despite of all precautionary measure and use of Zidovudine mother to infant transmission was seen in 2 cases.

**Conclusion:** Early contact with health care facility, ART for the pregnant HIV positive mothers, proper follow up, use of Zidovudine intrapartum and postpartum for mother and baby is associated with a better outcome of pregnancy, reduced mother to child transmission of HIV and a normal new born.

**Keywords:** HIV; ART; Zidovudine

### Introduction

There are an estimated 2.5 million HIV-infected persons in India, at the end of 2010; an estimated 34 million people were living with

AIDS worldwide [1]. India harbours the third largest number of HIV infected individuals in the world [2]. Nearly 30% are women of reproductive age who are often diagnosed for the first time during pregnancy. The first documented HIV infection in India was among

a cohort of sex workers in the southern State of Tamil Nadu, in 1986 [3,4]. The virus since then has been spreading rapidly across the country. States with a high prevalence of HIV include Maharashtra, Tamil Nadu, Karnataka, Andhra Pradesh, Manipur, and Nagaland [1,3]. There is limited data from India on HIV and birth outcomes. With the prevalence of HIV in the antenatal clinics in many parts of India nearing 1% in 2008, measures to avert neonatal adverse outcomes in this population are important for child survival. Determining birth outcomes among this population along with surveillance of cases of mother-to-child transmission is the need of hour.

The present study was done to determine the prevalence of HIV seropositivity in females attending ANC clinic and to study the birth outcome of HIV positive pregnant females.

## Material and Methods

**The study area and population:** This study was carried out over a period of three years from January 2011 to December 2013 in the Department of Microbiology, Jawaharlal Nehru Medical College, Aligarh, India. The sample population included 6067 pregnant women registered and counselled at the antenatal clinics of this hospital.

**Sample collection and processing:** Informed consent was obtained from each pregnant woman prior to sample collection. Five ml venous blood sample was collected in a sterile plain container from all pregnant women who came for testing. Blood was allowed to clot for 30 minutes at room temperature (25-30 °C) and serum was separated. The serum samples were tested within 24 hrs.

**HIV serology and CD4 cell count:** HIV infection was diagnosed using three antigenically different kits as per the national HIV testing policy [9]. CD4 cell counts were determined by flow-cytometry technique by Partec CyFlow® Counter (Germany). The CD4 counts were stratified in accordance with the 1993 CDC (Centers for Disease Control) Revised Classification for HIV infection into 3 groups – > 500, 200–500, and < 200 cells/mm<sup>3</sup>.

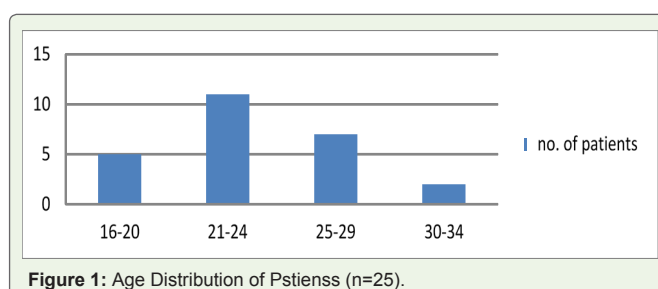
**Parameters of birth outcome perinatal Characteristics:** Obstetric and Perinatal Characteristics of mother included Gestational age at time of diagnosis of HIV, CD4 cell count at diagnosis, Risk factor for transmission, HIV status of husband, Opportunistic infections and the preventive action taken at the time of delivery (Table-2). The birth outcome of HIV positive females included Elective abortion, Spontaneous abortion, Gestational age at delivery, Preterm delivery, Mean birth weight, Early neonatal mortality, Mother to infant transmission (Table-4).

## Results

A total of 6067 pregnant females were screened for the presence of HIV in antenatal patients over three year period. Overall positivity

**Table 1:** Year Wise Prevalence of HIV in Pregnant Women.

Year	Total tested	HIV positive	% positivity
2011	1926	8	0.41
2012	2023	9	0.44
2013	2118	8	0.37
Total	6067	25	0.41



**Figure 1:** Age Distribution of HIV Positive Females (n=25).

**Table 2:** Characteristics of HIV Positive Females

Obstetric and Perinatal Characteristics of mother	No. of positives (%)		
	First trimester	Second trimester	Third trimester
Gestational age at time of diagnosis of HIV	17 (0.46%)	6 (0.43%)	2 (0.21%)
Risk factor for transmission	Heterosexual	others	
	13 (52%)	12 (48%)	
Opportunistic infections	Present	Absent	
	5 (20%)	20 (80%)	
HIV status of husband	Positive	Negative/unknown	
	11 (44%)	14 (56%)	
CD4 cell count at diagnosis (cells/mm <sup>3</sup> )	<200	>200	
	6 (24%)	19 (76%)	
Antiretroviral therapy administered at and following delivery	Positive	Negative	
	21 (84%)	4 (16%)	

rate was found to be 0.41% (Table 1). Their age range was 16-34 years (median 24 years). The majority (44%) were in the age group 21-24 years, followed by 25-29 years (28%) (Figure 1).

The Obstetric and Perinatal Characteristics of HIV positive females described in table 2, out of total 25 HIV positive females 17 were diagnosed in the first trimester, 6 females in second trimester and 2 in the third trimester. Out of total 6067 females screened for HIV 61% had their first contact with the ANC in First trimester (Table 3, Figure 2). Husbands of 21 (84%) females were tested positive for HIV infection, and in these cases the mode of transmission was taken as heterosexual.

The birth outcome of HIV infected pregnant women (Table 4), 4 delivered dead fetes. The remaining 21 women gave birth to live babies. Of these, 1 was a preterm delivery (35.2 weeks), and the rest delivered at term. There was no IUFD, spontaneous miscarriages or maternal deaths. All live born infants received antiretroviral prophylaxis after. There was no an intra-uterine fetal death (IUFD), spontaneous miscarriages, or maternal mortality. despite of all precautionary measure and use of Zidovudine mother to infant transmission was seen in 2 cases.

## Discussion

Testing the HIV status of the females attending ANC provides an effortless opportunity not only for screening and prevent mother-to-child transmission but also to sensitize and educate them about HIV/AIDS, family planning and preventive aspects of health care.

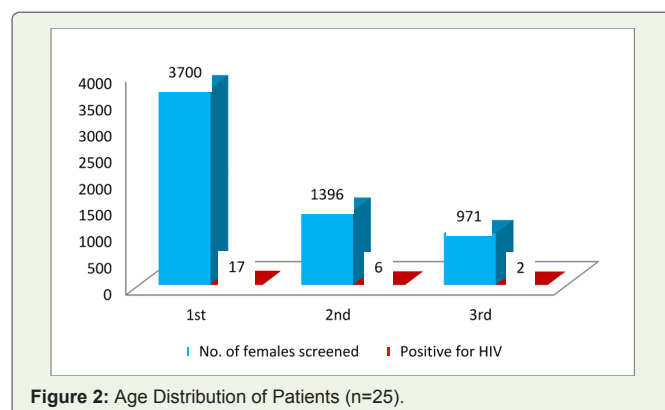
The present study although not representing in whole population

**Table 3:** Trimester wise distribution of the pregnant females screened for HIV infection

Trimester	No. of females (%)	Positive for HIV (%)
1 <sup>st</sup>	3700 (61)	17 (0.46)
2 <sup>nd</sup>	1396(23)	06 (0.43)
3 <sup>rd</sup>	971(16)	02 (0.21)
<b>Total</b>	<b>6067(100)</b>	<b>25 (0.41)</b>

**Table 4:** Birth outcome of HIV infected pregnant women (n=25)

Characteristics of mother/infant	
Elective abortion	Nil
Spontaneous abortion	Nil
Maternal mortality	Nil
Mean gestational age at delivery	38.3
Preterm delivery	01
Mean birth weight	2.97 (Kg)
Still birth	4
IUD	Nil
Early neonatal mortality	Nil
Total number of live births	21
Total number of infants receiving zidovudine Prophylaxis	21
Mother to infant transmission	02

**Figure 2:** Age Distribution of Patients (n=25).

in general, provides the insight of the prevalence of HIV positivity in the pregnant females attending ANC clinic. As expected the HIV positivity of 0.41% in our study is higher than the overall prevalence (0.3%) in general Indian population as the study cohort includes the most vulnerable population in terms age and sexual practices. Also because of the screening nature of the test rather than investigative.

While analyzing the trend of HIV prevalence and the number of females tested in the past 3 years (2011 to 2013). The change in the prevalence rate was not significant (0.41, 0.44, 0.37%), the gradual and persistent increase in the number of female attending the ANC and screened provides some solace.

The overall, HIV seroprevalence found in our study was 0.41%. Similar seroprevalence of 0.41% were noted by Sinha et al. in 2008 [5]. A slight higher prevalence of 0.56% were noted by Mandal et al. in 2010, 0.77% by Parmeshwari et al. in 2009 and 0.72% by Nagdeo et al. in 2007 [6-8], in comparison, lower seroprevalence of 0.17% were observed by Chaudhari et al. in 2010, 0.35% by Joshi et al. in 2010 [9,10].

In our study, the HIV infection was highest in the age group of 21-21 years (41.86%) closely followed by 20 to 24 yrs (44%). Ukey et al. reported that HIV infection was highest in the age group of 19-24 years (46.94%) followed by 25-29 years (31.29%) [11]. It may be because of the fact that 20 to 29 years is the most sexually active age group. High prevalence in this group can be considered as forecasting of financial burden as well as loss of youth for the nation. HIV prevalence in younger age groups (15-24 years) is a useful proxy for trends in HIV incidence. A declining trend among antenatal women from Karnataka, Andhra Pradesh, Maharashtra and Tamil Nadu has been described [12].

Our study indicates that the HIV status of the perinatal women does not apparently affect the birth outcome in terms of elective abortions, miscarriages, IUFD, birth weight, preterm labour or maternal mortality rate. This may be because most of the females were tested early in pregnancy and were put on ART along with the proper intrapartum preventive measures. This fact stresses on the timely ANC visits of pregnant females, starting early in the gestational age. In one study conducted on young HIV-infected Indian pregnant women, researchers found those who received regular antiretroviral therapy had no adverse pregnancy outcomes [13].

In conclusion, early contact with health care facility, ART for the pregnant HIV positive mothers, proper follow up, use of Zidovudine intrapartum and postpartum for mother and baby is associated with a better outcome of pregnancy, reduced mother to child transmission of HIV and a normal new born.

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