

## Original article

# Changing trend of HIV seroprevalence among pregnant women in and around Pune: tertiary care hospital based study

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### Abstract:

**Introduction-** Immunodeficiency Virus (HIV) infection is a major threat to pregnant females pertaining to their physiologically lowered immune status. Mother to child transmission is one of the most significant route of transmission of HIV infection; thereby adversely affecting the outcome of pregnancy. Majority of the seropositive pediatric population have maternally acquired infection. PPTCT (parent-to-child-transmission) program, launched by NACO through the introduction of PPTCT centers holds the aim of early diagnosis and prevention of transmission. This study was conducted to know the changing trends of HIV prevalence in pregnant women in & around Pune, presenting to the PPTCT Centre at Sassoon General Hospital, Pune.

**Objective -** To know the seroprevalence of HIV with changing trends of HIV infection in Pregnant females

**Material & Methods-** This was a retrospective hospital record based descriptive study; cross-sectional in design; carried out by the analysis of data collected from PPTCT Centre; Department of Microbiology & Obstetrics & Gynecology at B. J Medical Government Medical College, Pune. All pregnant women registered at antenatal clinic in Sassoon general Hospitals, Pune from January 2009 to December 2017 were included in this study. After informed consent, all the essential information was collected by the PPTCT counselor during counseling, under strict confidentiality. The samples were tested as per NACO guidelines and the results were given during the post-test counseling. During this study, various demographic factors were studied.

**Results-** The data collected over a period of 9years was analysed. After counselling, total 48,853 women were ready for HIV testing under PPTCT. HIV antibodies were detected in 580 out of 48,853 samples tested, thus HIV prevalence rate was found to be 1.18%. Out of 580 HIV positive cases, only 2 were seroreactive for HIV-2 antibodies, while rest were positive for HIV-1 antibodies. The prevalence dropped from 2.12% in 2012(the highest) to 0.12% in 2017. Out of 580 HIV positive females 50.34% were primigravida while 49.65% were multigravida. Majority (81.9%) belonged to age-group 18-28 years followed by 29–30 years (17.4%), and least in 40 years and above age (0.7%). Among the HIV positive females 24.13% had primary education, while 26.4% had secondary education, 38.1% had received education in college and above; while 11.37% were illiterate. Out of 580 seropositive, 85.9% were housewives and 14.13% were working. Pretest counseling was done in 532 spouse but only 430 samples were available for testing. Out of 430 samples tested 307( 71.39% ) were positive for HIV 1 antibody.

**Conclusion-** This study concludes that recently prevalence rate of HIV in pregnant women is decreasing due to effective PPTCT programme. Thus by estimating seroprevalence in pregnancy the effective and timely intervention can be undertaken that will reduce the transmission of infection to newborn babies. Repeated counseling can improve the awareness and reduce the prevalence.

### **Introduction:**

Human Immunodeficiency Virus (HIV) infection is a major concern to the global health and development. Mother to child transmission is one of the most significant routes of transmission of HIV infection in pediatric age group<sup>1</sup>. As per the NACO annual report of 2016 in India, out of 90 lakh pregnant women, 5856 were HIV positive<sup>2</sup>. WHO has reported nearly 49,000 HIV positive pregnancies out of 27 million pregnancies every year worldwide<sup>3</sup>. To address this issue WHO has implemented Prevention of Parent to Child Transmission (PPTCT) Program globally. This Program was launched by NACO, in India in year 2002 with aim of early diagnosis & treatment of HIV positive pregnant women along with prevention of transmission of HIV in infants. PPTCT center is functional at Sassoon General Hospitals, Pune, and Maharashtra from year 2008. Estimating the seroprevalence of HIV in pregnant women would aid in developing and prioritizing prevention of parent-to-child transmission of HIV (PPTCT) programs. A review of literatures has revealed prevalence of HIV in pregnant women in various areas of India and Maharashtra ranging to be 1.11% – 2% in 2002-2003 and 0.37% – 0.2% in 2011-2012<sup>3</sup>. But there are very limited data available on recent trend of HIV infection in pregnant women in and around Pune, a city situated in the Western part of Maharashtra. Therefore, this study was conducted to determine the seroprevalence of HIV and to know the changing trend of HIV infection in pregnant women in and around Pune.

### **Materials and methods:**

This was a retrospective hospital record based descriptive study; cross-sectional in design; carried out by the analysis of data collected from PPTCT center; Department of Microbiology & Obstetrics and Gynecology at BJ Medical Government Medical College, Pune. The study included all the pregnant women attending PPTCT center from January 2009 to December 2017. Pregnant women registered at the antenatal clinics of Sassoon General Hospitals are routinely advised for HIV testing after pre-test counseling and informed consent. As per the NACO guidelines, the counselor of the PPTCT counseled the pregnant women under strict confidentiality. All the demographic data like age, marital status, education occupation were collected from the pregnant women by the PPTCT counselor during pretest counseling. After pre-test counseling and obtaining informed consent from them, blood samples were collected for HIV testing. The samples were tested for HIV antibodies by applying Strategy III guidelines and the testing policy of NACO, Government of India<sup>2</sup>. Samples which were reactive on first rapid test based on Enzyme Immuno-Assay (EIA) were subjected to another two rapid tests based on two different principles. The samples were reported positive if all the three tests showed reactive result. The test were performed as per the manufacturer's instructions.

### **Results:**

In this nine-year period, from January 2001 to December 2017, a total of 48,853 women gave consent for HIV testing under PPTCT Program. HIV antibodies were detected in 580 out of 48,853 samples tested, thus HIV prevalence rate was found to be 1.18%. Of 580 HIV positive pregnant women only two were sero-reactive for HIV-2 antibodies while the others were positive for HIV-1 antibodies. A year-wise analysis showed that the number of pregnant women screened for HIV increased from year 2013 to 2017. The number of women tested and the prevalence is given in Table-1. Prevalence of HIV infection in antenatal women was highest at 2012 followed by 2009 and 2011 i.e., 2.12%, 2.06%,

2.05%, respectively. It was noted that prevalence had significantly decreased in recent year, 2017 i.e., 0.12%. Majority of the HIV positive pregnant women (81.9%) were in the age group of 18-28 years followed by 29–30 years (22.4%), and least in the 40 years and above age group (0.68%) (Table-2). Of the 580 HIV positive women, 50.34% HIV positive women were primigravida and 49.65% were multigravida. Demographic profile of the HIV positive pregnant women is shown in Table-3. It was observed that a majority, 38.1%, were educated to the college level, 26.4% were educated to secondary level, 24.1% to primary level, while, 11.3% were illiterate. In all, 85.9% of these HIV positive women were housewives and 15.8% were working on a job. Pretest counseling was done in 532 spouses but only 430 samples were available for HIV testing at ICTC (Integrated Counseling and Testing Center). Out of 430 samples tested for HIV antibody 307 (71.39%) were positive for HIV-1 antibody (Table-4).

**Table 1: Year-wise prevalence rates of HIV infection in pregnant women**

Year	Total tested	HIV positive	% positivity
2009	5532	114	2.06
2010	4067	81	1.99
2011	4872	100	2.05
2012	4985	106	2.12
2013	6227	97	1.55
2014	6023	26	0.43
2015	5741	20	0.34
2016	5660	29	0.51
2017	5806	7	0.12
Total	48,853	580	1.18

**Table 2: Age-wise distribution of HIV-Positive pregnant women**

Age (years)	HIV Positive (%)
18-28	475 (81.9)
29-30	104 (17.4)
>40	4 (0.7)
Total	580

**Table 3: Socio-demographic factors of HIV positive pregnant women**

<b>Gravida</b>	
Primigravida	292 (50.34%)
Multigravida	288 (49.65%)
<b>Education</b>	
Primary school	140 (24.13%)
Secondary school	153 (26.37%)
College and above	234 (38.10%)
Illiterate	66 (11.37%)
<b>Occupation</b>	
Housewife	498 (85.86%)
Working on a job	82 (14.13%)

**Table 4: Spouse positivity in HIV positive pregnant women**

<b>Total HIV positive women</b>	<b>No. Of spouse tested</b>	<b>HIV Positive</b>
<b>n= 580</b>	<b>430</b>	<b>307(71.39%)</b>

**Discussion:**

HIV infection in pregnant women is of great concern in developing countries like India. Prevention of parent to child transmission (PPTCT) Program has taken a rapid stride during the past few years in bringing down the transmission of HIV from mother to child. Prevalence of HIV infection in pregnant women in India has ranged from 0.7% to 1.2%.<sup>4</sup> In the present study, HIV seroprevalence decreased in year 2017 (0.12%) which reflects effective intervention of PPTCT Program showing awareness of HIV infection in pregnant women. Kunte et al<sup>5</sup> have reported 1.2% HIV prevalence in their study conducted in Pune district in year 1999. As per the study conducted by Gupte et al,<sup>6</sup> the HIV infection rate in antenatal women was 2.2% in 2002-2003 and has declined to 0.73% in 2006 in Pune, India. Giri et al<sup>7</sup> and Patil et al<sup>8</sup> have documented 0.41% and 0.44% seroprevalence in state of Maharashtra in year 2012 and 2016, respectively. The prevalence of other studies conducted in India is as follows:

<b>Name of the author</b>	<b>Year of study</b>	<b>Place of study</b>	<b>Prevalence</b>
Kulkarni <i>et al</i>	2013	Maharashtra	0.76%
Khokar <i>et al</i>	2015	Gujarat	0.39%
Preethkanwal <i>et al</i>	2016	Punjab	1.03%
Hussain <i>et al</i>	2016	Agra	5.77 %

There is increase awareness about the disease and prevention of infection in recent years in India. In the present study, majority of the HIV positive pregnant women (81.9%) were in the age group of 18-28 years followed by 29-30 years (22.4%). Similar findings were reported by, Sayare et al<sup>3</sup>

in their study showing maximum number of seropositivity in the age group of 25-29 years i.e., 47.22%, followed by 20-24 years age group with 30.56 %. This shows that young reproductive age group of women are at the risk of HIV infection. However, screening these population for HIV testing and counseling at PPTCT center provides opportunity to know their HIV status. Through Counseling HIV positive mothers can be educated to prevent transmission of HIV infection in their infants.

In this study population, majority of HIV pregnant women were primigravida (50.34%), while 49.65% were multigravida. Patil et al<sup>8</sup> have reported same findings where, out of 309 HIV positive pregnant women 166 (53.83%) were primigravida and 143 (46.2%) were multigravida. Similar findings were seen in studies conducted by Verma *et al*<sup>9</sup> and Dash *et al*.<sup>10</sup> The percentage of multigravida attending the Institutional Tertiary care hospitals were more in number which brings out increasing awareness of HIV testing among these groups. In the present study, education status of the 580 HIV positive pregnant women showed that 24.1% had education up to primary school level, 26.4% had up to secondary education, 38.1% had up to college and above, while, 11.37% were illiterate. This depicts requirement of good ongoing community education programs on HIV among the illiterate and less literate population. Occupation wise distribution of HIV positive women showed that 85.9% were housewives and 15.8% were working on a job.

In PPTCT, pretest counseling of spouses was also done to know their HIV status. Spouse were referred to ICTC for HIV testing. Total 532 spouse of 580 positive pregnant women were available for counseling; out of which only 430 gave consent for testing. Among these 430 samples tested 307 (71.39%) were positive for HIV-1 antibody. Heterosexual route is the most common route of infection for HIV. Majority of women possibly must have been exposed to HIV infection from their spouse; however, some may have acquired it through their own risky behavior.

#### **Conclusion:**

This study concludes that prevalence rate of HIV in pregnant women in around Pune is decreasing due to effective PPTCT Program. Seroprevalence trend of HIV infection in pregnant women should be monitored so that the effective and timely intervention can be undertaken to reduce the transmission of infection to newborn babies.

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- 2) Maharashtra & State AIDS Control Society, Mumbai: Testing of HIV samples were done as per the NACO protocol & the kits supplied by MSACS.

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