



# **Performance Evaluations**







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# **Performance Evaluations**



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# **615.** HIV Infection in Pregnant Women from Rural South India Compared to HIV Infection in Volunteer Blood Donors from Urban South India

• Session: Poster Session: HIV Epidemiology Saturday, 11 October 2003: 12:00 AM Room: Exhibit Hall A

**Introduction**: MediCiti SHARE (www.mediciti.org) is a not for profit health care system based in south India. REACH (Rural Effective Affordable Comprehensive Health) serves a population of 43,000 in two rural counties and provides antenatal care to 4000 women each year. Those referred to MediCiti for obstetric care are offered antenatal testing for HIV. MediCiti screens all blood donors for HIV. We report results of HIV seroprevalence in pregnant women receiving care at the rural center vs. HIV seroprevalence in blood donors from the urban center.

Methods: Serologic data for women receiving obstetric care at the rural center and for volunteer blood donors from the urban center were reviewed. Screening for HIV was with <u>Detect HIV</u> (Biochem Immunosystem Canada); positives were confirmed by <u>HIV TRIDOT</u> (Biotech Inc Himachal Pradesh India) and/or <u>HIV DUO</u> (Bio Merieux SA France). HBsAg was determined using <u>SURASE B-96</u> (General Biological Corporation Hsin Chu, Taiwan) and VDRL using <u>CARBOGEN VDRL</u> (Tulip Diagnostics Goa, India).

#### Results:

Pregnant women in the rural areas had a higher HIV seroprevalence 1.19% vs. urban blood donors 0.38% (odds ratio 3.096; 95% CI 1.717 to 5.585; P < 0.001). Seroprevalence of Hepatitis B surface antigen was lower in rural pregnant women 0.29% vs. urban blood donors 1.13% (odds ratio 0.256; 95% CI 0.081 to 0.803; P= 0.018). Prevalence of Syphilis (VDRL) was extremely low in both populations.

**Conclusion:** HIV seroprevalence of volunteer blood donors and pregnant women, serve as an estimate of seroprevalence in the general population. Incongruence of HIV and Hepatitis B surface antigen seroprevalence was surprising. Expanded access to routine HIV testing including rural areas would be desirable to design and monitor optimum strategies for control of the pandemic.

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# HIV status and re-activity to RA, ASO, CRP, Syphilis and Facs count among leprosy patients

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(Received : May, 2014 : Revised : June, 2014; Accepted : July 2014)

#### Abstract

Twenty five leprosy patient's blood serum compare to control healthy person's blood samples were tested for HIV status and re-activity torheumatoid arthritis, ASO, CRP, VDRL and facs count among leprosy.None of the sample was found to be positive for antibodies to HIV ½. Out of twenty five leprosy samples, three were reactive for Rheumatoid Arthritis factor and seven were positive for antibodies to syphilis as revealed by the test. Further two were reactive for C-reactive protein and one were having titre of Anti-Streptolysin-O. Screening for HIV, Rheumatoid Arthritis and Anti-Streptolysin-O, C-reactive protein and Syphilis (VDRL) were done in order to know the prevalence levels of these infections, as biological markers of risk. Thus, screening the leprosy patients for these would go a long way in early detection of these co-infections. Early treatment, if initiated, would help in further deterioration of the condition of these patients.

**Key words :** HIV, leprosy, rheumatoid arthritis, ASO, CRP, Syphilis.

#### Inroduction

India has the largest number of known cases of leprosy and happens to incidentally be endemic for HIV as well. According to Ridley and Jopling (1966) studies done in North and North-Eastern India did not ûnd any association of HIV infection with leprosy patients. A few studies from South Indian states showed a higher prevalence of HIV infection among leprosy patients, but these studies alone do not provide any indication of its association with leprosy (Jayasheela et al., 1994). Leprosy caused by *Mycobacterium leprae*has an unusually long incubation period, and infection with HIV leads to a profound drop in CD4+ T-lymphocyte count and function and compromises the cell-mediated immune response, as well (Miller, 1991; Saha et al., 1993). Earlier studies carried out in this center suggested that per thousand (5/4025:0.124%) of the leprosy patients harbored HIV infection. Follow-up of these patients at an interval of six months, revealed that none of them downgraded into a severe form of leprosy nor developed ARC or AIDS (Hussain et al., 2000). Although this study indicated that leprosy is not a risk factor for developing HIV-1 infection, the HIV surveillance studies on this population was continued with a view to assess the risk and ûnd out the trend in an area where both the infections are prevalent. Some studies shows that the histological features of leprosy also appear to be preserved in HIVinfected patients (Moran et al., 1995; Pereira et al.,2004).

One of the commonly observed complaints among leprosy patients was pain in the joints. Many studies have proven that microbial agents might

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trigger the autoimmune phenomenon and induce rheumatoid arthritis (Albert et al., 1980; Cossermelli-Messina et al., 1997; Gibson et al., 1994). In order to ûnd out if arthritis is present in the HIV-leprosy co-infected patients, the sera from these cases were tested for Rheumatoid arthritis (RA) factor. Many risk behaviors as well as the routes of transmission for HIV infection are identical to those for other sexually transmitted diseases (STDs). For this reason, the leprosy sera samples were tested for Rheumatoid Arthritis andVDRL simultaneously with HIV.

#### Materials and methods

Leprosy patients, across the spectrum, i.e., tuberculoid (TT), borderline-tuberculoid (BT), midborderline (BB), borderlinelepromatous (BL), lepromatous (LL) and neuritic (N) types, classiûed, according to Ridley-Jopling criteria (Ponnighaus et al., 1991), attending the Unit-I of the Outpatient's Department (OPD) of the Central JALMA Institute for Leprosy and other Mycobacterial Diseases (CJILOMD) were included in the study. The leprosy cases in the study were neither newly admitted nor untreated patients, although a few were newly detected cases. For bacteriological determination, the six skin sites used were the two ear lobes and four representative active skin sites, i.e., hand (right arm and left arm), elbow (right and left), back, forehead, and the site of the lesion. In our OPD, four skin sites are routinely used for determination of the bacteriological index (B.I.). The inclusion criteria were: adult leprosy patients between the age group of 16 to 48 yrs. Children and old patients were excluded from the study as it was assumed they were not likely to be sexually active.

Blood samples were collected asceptically from twenty five leprosy patients and twenty five nornal healthyby ante-cubital venipuncture after obtaining pre-informed consent. Samples left at room temperature for 3-4 hours or kept overnight at 4°C for serum separation. Then serum is separated and collected in eppendrof tubes and labeled properly. The sera samples collected after stored at -20°C until the assays were performed. ELISA was done using Genedia HIV-1/2 EIA kit (Greencross, Korea). Those found positive were conûrmed by rapid (HIV capillus latex aggregation assay, Trinity Biotech PLC, Ireland) and Western blot assays (WesternBlot, BIO-RAD, NEWLAVBLOT), Nippon Bio-Rad Laboratories, Japan. After post-test counselling, a report was handed over to those found HIV-positive and patient was referred to clinicians for further care and management. To ûnd out any other co-infections, the samples were further tested by HBsAg kit, (Immunochromatography test ERBA Hepline, Transasia Bio-Medicals Ltd., Mumbai, India) and VDRL and Rheumatoid Arthritis kits (Carbogen and Rhelax, RF of Tulip Diagnostics (P) Ltd., Bambolim, Goa, India).

#### **Result and Discussion**

None of the sample was found to be positive for antibodies to HIV ½ (Fig. 1). Out of twenty five leprosy samples, three were reactive for Rheumatoid Arthritis factor and seven were positive for antibodies to syphilis as revealed by the test. Further two were reactive for C-reactive protein and one were having titre of Anti-Streptolysine-O.

C-reactive protein and Anti-Streptolysin-O rise in acute phase of infections. In the absence of definite diagnosis, much before, appearance of the symptoms of the disease, assessing the levels of reactivity of the C-reactive protein and Anti-Streptolysin-O might be a useful diagnostic tool.

CD4+/CD8+ count declines in leprosy patients, the CD4+ cells counts were found to be were also low i.e. below 500, CD8+ cells count 299 and the CD4+/CD8+ ratio was 1.38.CD4+/CD8+ count declinesin HIV infection, the CD4+ cells counts were found to be were also low i.e. below 100, CD8+ cells count high i.e. up to 500and the CD4+/CD8+ ratio was 0.17. CD4+/CD8+ count declines in in normal healthy control, the CD4+ cells counts were found to be were also high i.e. upto 800, CD8+ cells count high i.e. up to 400and the CD4+/CD8+ ratio was 2.02.

Screening for HIV, Rheumatoid Arthritis and Anti-Streptolysin-O, C-reactive protein and Syphilis (VDRL) were done in order to know the prevalence levels of these infections, as biological markers of risk. Thus, screening the leprosy patients for these infections. Early treatment, if initiated, would help in would go a long way in early detection of these co-further deterioration of the condition of these patients.



Table 1. HIV status and FACS counts of leprosy patients, HIV positive and normal healthy controls.

Samples	HIV Status		FACS Count			
	Elisa	Capillus Latex	CD4+	CD8+	CD3+	CD4+/CD8+ ratio
		agglutination				
Leprosy patients	-ve	-ve	315	229	562	1.38
HIV Positive patients	+ve	+ve	91	536	624	0.17
Normal healthy controls	-ve	-ve	857	422	1429	2.02

In normal healthy individuals CD4+ cell counts is higher than CD8+ cells. In HIV infective patients CD4+ cells counts is lower than CD8+ cells. In leprosy patients both CD4+ and CD8+ cells counts is decline than normal value.

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# A Study on the HBV and the HCV Infections in Female Sex Workers and their Co-Infection with HIV

DESAI PRASEEDA S., DUTTA ANURADHA, SHASTRI JAYANTHI S.

### ABSTRACT

**Background:** Sexually Transmitted Infections (STIs) have been shown to enhance the transmission of the Human Immunodeficiency Virus (HIV). The Hepatitis B and the Hepatitis C viral infections are highly prevalent among the HIV-infected persons as a result of shared transmission routes.

**Aim:** To determine the seroprevalence of the HIV, Syphilis, HBV and HCV infections and their co-infection rates among Female Sex Workers (FSWs). Settings and Design: 250 blood samples were collected from FSWs from a red light area of Mumbai by using an outreach strategy.

**Materials and Methods:** Their sera were tested for the HIV antibodies as per the strategy II of the NACO guidelines, for syphilis by RPR, for the HCV antibodies and for HBsAg by ELISA.

**Results:** The study group showed (105/250) 42% HIV reactivity, (15/250) 6% RPR reactivity, (20/250) 8% HBsAg positivity, (7/250) 2.8% HCV reactivity, (11/250) 4.4% HIV-RPR reactivity, (7/250) 2.8% HIV-HBV co-infection and (3/250)1.2% HIV-HCV co-infection.

Statistical test which was used: The Chi square test.

**Conclusion:** A high HIV sero-prevalence was found among the FSWs. A high HIV prevalence was found among the RPR reactive FSWs. The relationship between the HIV reactivity and the RPR reactivity was statistically significant. Co-infections with HBV and HCV were detected among the HIV reactive FSWs, but they were not statistically significant.

### Key Words: HIV, HBV, HCV, FSW

### INTRODUCTION

The Human Immunodeficiency Virus (HIV), the Hepatitis B Virus (HBV) and the Hepatitis C Virus (HCV) have common modes of transmission, namely sexual, parenteral and prenatal, the most common being sexual transmission. A history of multiple sex partners, irregular condom use by the clients, and co-infection with other STIs constitute the potential risk factors which are associated with the HIV infection among the FSWs [1]. The Hepatitis B and C viral infections are highly prevalent among the HIV-infected persons, generally as a result of the shared transmission routes, namely sexual, parenteral and perinatal, the most common one being sexual transmission [2]. The HIV screening is done routinely; however, the screening for hepatitis viruses remains somewhat neglected.

Hence, we carried out this study to determine the prevalence of these infections in the FSW population, as well as to find the coinfection rates among this population .\_

#### **MATERIALS AND METHODS**

This study was conducted after obtaining permission from the institutional ethics committee. The samples were collected during October to December 2007. The tests were performed during 2008. The data composition and analysis were done in 2009-10.

The sample size: A 250 sample size was determined by the formula,  $n=Z^2 p (1-p)/d^2$ , where n= sample size, z= 1.96 for 95% confidence limit, p= prevalence rate and d=degree of precision [3].

The serum samples were collected from 250 Female Sex Workers from an STI clinic in a red light area by using an outreach strategy, over a period of three months i.e. October- December 2007. They were tested on an unlinked anonymous basis after obtaining an informed consent from the subjects.

**Inclusion criteria:** According to the UNAIDS definition, the women who receive money or goods in exchange for sexual services, either regularly or occasionally and those who may or may not consciously define these activities as income generating, are female sex workers [4]. The subjects who visited the clinic for the first time during the study period, were included in the study.

Exclusion criteria: The repeat visitors were excluded.

The following details were noted in the proforma: Age, literacy status and the presence of any STD symptoms.

The samples were tested for the HIV antibodies by using Microlisa (J. Mitra and Co, New Delhi) and Retrocheck (Qualpro Diagnostics, Goa, India) as per the Strategy II of the NACO guidelines [4], for the anti HCV antibodies by using the Innova HCV ELISA Kit (Span Diagnostics, Surat, India), for HBsAg by using the Microscreen HBsAg ELISA kit (Span diagnostics, Surat, India) and for the Reagin antibodies by RPR (Carbogen, Tulip diagnostics, Goa). The positive samples were confirmed by retesting by the respective ELISA tests.

**Ethical consideration:** This study was conducted after obtaining the approval of the institutional ethics committee.

Statistical analysis: It was done by using the Chi square test.

#### RESULTS

The ages of the 250 FSWs in our study ranged between 17 to 48 years. Three were less than 20 years and 204 were between 20-39 years of age. The mean age of FSWs was 31 years with an S. D.



[Table/Fig-1]: Age distribution among the FSWs (n=250)

#### of 6.52 [Table/Fig-1].

234 (93.6%) of the FSWs did not have the symptoms of STDs. [Table/Fig-2].

STD Symptoms	Positive	Percentage				
Asymptomatic	234	93.6%				
Genital ulcer	02	0.8%				
Urethral discharge	13	5.2%				
Urethral ulcer & urethral discharge	2	0.8%				
Genital warts	0	0				
Total	250					
[Table/Fig 2]: symptoms of STD among ESW/s						

106 (42.4%) of the FSWs were HIV reactive; Most of them were infected with HIV1 [Table/Fig-3].



In 30-39 age-group, 50% FSWs were HIV reactive [Table/Fig-4].



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9 out of 17 (53%) of the symptomatic STD patients were HIV positive. All the patients with urethral ulcers and urethral discharges were HIV reactive [Table/Fig-5].

STD Symptoms	Total	HIV Reactive			
Genital ulcer	02	01(50%)			
Urethral discharge	13	06(46.15%)			
Urethral ulcer & urethral discharge	02	02(100%)			
Total	17	09(53%)			
[Table/Fig-5]: STD symptoms in HIV reactive FSW's					

 $X^{2}(2, n=17) = 2.025, p=.3633$  No statistical correlation was found between the STD symptoms and the HIV reactivity.

15 (6%) of the FSWs were RPR Reactive. Only one FSW with a symptomatic STD was RPR reactive. She presented with a urethral discharge.

19 (7.6%) of the FSWs were HBsAg reactive. A majority of the HBsAg reactive FSWs were in the age group of 20-29 years. All the HBsAg reactive FSWs were non-migrants and none of them had studied beyond standard V. Only 1 of the FSW's who had symptoms of an STD , was HBsAg positive. She had presented with urethral ulcers and discharge.

Seven (2.8%) FSWs were HCV reactive [Table/Fig-6].



#### [Table/Fig-6]: HCV reactivity among FSWs

	HIV (+)	HIV(-)	Total		
RPR (+)	12 (4.8%)	03 (1.2%)	15 (6%)		
RPR (-)	94 (37.6%)	141 (56.4%)	235 (94%)		
HBsAg (+)	07 (2.8%)	12 (4.8%)	19 (7.6%)		
HBsAg (-)	99 (39.6%)	132 (52.8%)	231 (92.4%)		
Anti-HCV (+)	3(1.2%)	4 (1.6%)	7 (2.8%)		
Anti-HCV (-)	103 (41.2%)	140 (56%)	243 (97.2%)		
Total	106 (42.4%)	144 (57.6%)	250 (100%)		
[Table/Fig-7]: HIV, HBSAG, HCV & RPR reactivity (N=250)					

Most i. e. 12 out of the 15 (80%) RPR reactive FSWs were also HIV reactive. A majority were in the 20-40 year age group and they were illiterate. Only 11% of the HIV positive patients were RPR reactive. HIV and RPR reactivity was seen in 12 out of the 250 (4.8%) FSWs. corrected Chi square statistics=6.649. degree of freedom: 1 and p=0.009. It was statistically significant [Table/Fig-7].

An HIV and HBV co-infection was found in 7 (2.8%) out of the 250 female sex workers [Table/Fig-8].

Corrected Chi square statistics=0.072.degree of freedom: 1 and p=0.7883. This test was not statistically significant.

The HIV and HCV co-infection rate was 1.2% in the female sex workers. Chi square value: 0.132, degree of freedom: 1 and p=0.7166. This test was not statistically significant.

Two out of the 250 i.e. 0.8% FSWs showed HBV and RPR Reactivity.

	HBsAg (+)	HBsAg (-)	Total			
RPR (+)	2(0.8%)	104(41.6%)	106			
RPR (-)	17(6.8%)	127(40.8%)	144			
Total	19	231	250			
[Table/Fig-8]: HBV & RPR reactivity in female sex workers (N=250)						

Corrected Chi square statistics:7.1 degree of freedom: 1 and p=0.0073. This test was not statistically significant.

None of the FSWs were co-infected with HBV and HCV. None had all the three infections.

#### DISCUSSION

A history of multiple sex partners, irregular condom use by the clients, and co-infection with other STIs constitute the potential risk factors which are associated with the HIV infection among the FSWs [1]. The Hepatitis B and C viral infections are highly prevalent among the HIV-infected persons, generally as a result of the shared transmission routes, namely sexual, parenteral and perinatal, the most common one being sexual transmission [2].

HIV modifies the history of HBV and HCV. To complete the list, HBV and HCV remain a major cause of the hospital admissions and death in the HIV infected patients [5].

Due to multiple sex partners, the FSWs normally have high rates of different sexually transmitted infections, which include HIV. Also, their clients tend to have other high risk behaviours like illicit drug use, etc, thus increasing the risk of acquiring blood-borne viruses. In addition to this, the FSWs themselves may be intravenous (IV) drug abusers [1]. The reduction of the HIV incidence in the FSWs leads to a reduction of the same in the general population [6].

Though HBV, HCV and HIV share common routes of transfer, they differ in their prevalence by the geographical area and the entities by which certain types of exposures transmit them [7].

Different studies have reported different rates of infections among the FSWs. Unsafe vaginal sex increases the risk of acquiring HBV. While becoming infected sexually for HCV is less likely than that for HBV[8-11].

Our study on the high risk group of FSWs was aimed at identifying the factors that could influence the transmission of these 4 STIs. Similar studies were conducted at various places in India and abroad. The mean age of the FSWs in our study was 31 years, which was comparable with that in other studies which were conducted in India and other developing countries. One of the most important factors which forced women into commercial sex work was illiteracy and our study showed that 88% of our subjects were illiterate. Most of the FSWs denied a history of any STD symptoms, which may be due to taboo.

The 42% HIV reactivity among the FSWs was very high. Such high rates were also found in the Indian state of Karnataka and in rural Cambodia. An Italian study showed a lower rate of 4.6% [12]. This difference may be due to the different population dynamics. Most of the HIV reactive FSWs were in the 30-39 years age group. Studies which were done in Cambodia and Nigeria also showed the major affected age group to be the 25-35 years age group [13,14].

The 6% RPR reactivity among the FSWs was similar to that which was found in a study in Surat [15]. But higher rates i. e. 31.8% in Kakinada, 22% in Peddapurum [16] were reported. A lower rate i.e. 3.73% was found in BJMC, Ahmedabad [17]. Such a varied RPR reactivity was also seen worldwide. In Zanzibar, during 2006-7, the prevalence of Syphilis was 1.3% [18].

It varied from 14.2% in the US- Mexico border cities to 45.7% in Argentina[1,12,18-22]. This varied prevalence rates may be due to the different population characteristics.

HIV and RPR reactivities were seen in 4.8% of the subjects. It was statistically significant. It suggested that Syphilis significantly increases the risk of acquiring HIV. The HIV and RPR reactivity in various Indian studies ranged from 0.5% in Dibrugarh to 14.28% in Gujrat, India [15].

The 8% HBsAg reactivity was comparable to the 9.9% in the Kakinada study [16]. Among the other Indian studies, it ranged from 3.33% in Surat[15] to 12.2% in Peddapuram[16]. Similarly, it ranged from 3.5% in Italy[12], to 5.3% in Zanzibar[17], to 14.3% in Argentina [1], to 62% in Hongkong [22]. This may be due to the differences in the geographic locations and the population behaviours, as well as the risk factors like IV drug abuse.

The HIV-HBsAg reactivity was 2.8% in our study. It was lesser as compared to those in other studies i.e. 5.71% in a Surat study [15] and 12.2% in an Argentina study [1].

In our study, 0.8% of the FSWs showed HBV and RPR reactivities. Most of the studies did not find any coinfection. But it was higher ie. 7.5% in Argentina [1]. However, this study was conducted in FSWs by using IV drugs.

The HCV reactivity was 2.8% among the female sex workers in our study. Similar rates were found in Zanzibar (2%) [18] and Peru (2%) [23]. A lesser rate was found in Italy (0.9%) [12]. Higher rates were found in Argentina (4.3%), where IVDU was common among the FSWs [1]. The HIV and HCV co-infection rates were 1.2% each in the female sex workers. Similar low rates (0.5%) were found in Peru [23]. A very high coinfection rate of 30% was found among the Argentinian FSWs who had a very high rate of IV drug abuse [1]. Thus, the varied co-infection rates may be due to the differences in the major risk factors which were associated with the HCV infection i. e. IV drug abuse, illegal blood transfusions, etc. Hence, our study reconfirmed that the HIV infection itself does not increase the risk of the HCV infection.

None were found to be HBV and HCV co-infected or infected with all HIV, HCV or HBV.

The HIV and the HBV infections coexisted among the female sex workers. The seroprevalence of HCV was not significantly high, thus suggesting that the heterosexual route was not a major mode of transmission for HCV. Thus, the varied co-infection rates may be due to the differences in the major risk factors which were associated with the HCV infection i. e. IV drug abuse, illegal blood transfusions, etc. HIV was significantly associated with the RPR reactivity. The HIV-HBV and the HIV-HCV coinfection rates were low in our study. No significant association was found between the HIV, HBV and the HCV co-infections. But the high prevalence rates could be due to the high risk behaviour of this population group. Hence, there is a need to screen the FSWs for the HBV and the HCV infections.

#### CONCLUSION

There is a need to strengthen the HIV prevention programmes in the FSW population with an emphasis on the IEC activities, condom promotion, the early diagnosis and treatment of the STIs; needle exchange programmes, etc. HBV has a very effective vaccine. Hence, all FSWs, high risk groups and HIV positive individuals should be offered the HBV vaccination. The Hepatitis viral markers should be tested in the HIV positive individuals. In the absence of an effective treatment for these 3 diseases, prevention remains the key solution for the patient protection. Hence, these high risk groups need to have access to preventive measures, not only for HIV but also for HBV and HCV.

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# Prevalence of Syphilis in patients attending tertiary care hospital in Trichy district

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ARTICLE HISTORY	ABSTRACT
Received: 06.01.2014	Syphilis is a sexually transmitted disease [STD] with protean manifestations resulting from infection by <i>Treponema pallidum</i> .
Accepted: 12.02.2014	It can be easily treated with long acting penicillin. Syphilis promotes the transmission of HIV and both infections can
Available online: 10.05.2014	simulate and interact with each other. <i>Treponemes</i> may persist despite effective treatment and may have a role in reactivation in immunosuppressed patients.
Keywords:	A study was done to know the incidence of syphilis in the rural
Incidence, Rapid Plasma Reagin, Sexually transmitted disease, Syphilis, <i>Treponema pallidum</i> .	teaching hospital of Trichy district. A total of 4396 samples were collected from the patients during 2010 to 2013. Rapid Plasma Reagin [RPR] test was done. The incidence was found to be low [0.34%] and the maximum positivity was in the age group of 21-
*Corresponding author:	40 years. The incidence of syphilis at first prenatal visit was extremely low (0.31%). Partner notification, health education.
<b>Email :</b> hemarathinam2006@gmail.com <b>Tel.:</b> 91-9489780105	and screening in high risk populations and pregnant women to prevent congenital syphilis are essential aspects in controlling the infection.

#### **INTRODUCTION**

Syphilis is a systemic disease caused by the spirochete *Treponema pallidum* [1]. It is primarily a sexually transmitted infection (STI). Syphilis can also be acquired through congenital transmission to the newborn and blood transfusion, but these are much less common.

Globally, about 340 million new curable Sexually Transmitted Infections occur each year and out of these infections, syphilis accounts for about 12 million cases, 2 million of them being pregnant women [2]. However, these figures represent only a minor part of the problem since a large number of cases go unreported and are also likely to be either untreated or improperly treated.

It is seen throughout India, the prevalence being especially high among those who indulge promiscuous sexual activity and practice unsafe sex.

Screening for syphilis infection is widely done in the country by using a non treponemal anticardiolipin antibody detection test namely RPR [3,4]. The results of the screening test always need to be confirmed by a specific treponemal test and correlated with the clinical history, signs and symptoms [5].In India screening for anticardiolipin antibodies to determine exposure to syphilis is part of routine antenatal care. The test is also used in screening individuals with high risk behavior whether or not there are clinical signs and symptoms of syphilis.

It occurs worldwide, and the incidence varies significantly with geographic location. Limited information is available on this issue in Tamilnadu, South India. We report our experience with the screening for syphilis over a period of 4 years in the outpatient and inpatient department of our rural tertiary care centre, situated in Trichy district of Tamilnadu.

#### **MATERIALS AND METHODS**

This was a retrospective hospital based study. The results of routine antenatal [2910] and those with suspected sexually transmitted disease [STD] [1486] were reviewed. Blood samples from 4396 individuals were collected after getting an verbal consent of the concerned over a 4 year period from January 2010-December 2013. All serum samples were tested using the RPR test [Carbogen Tulip Diagnostics [P] Ltd] as per the manufacturers instructions.

Qualitative method: One drop of patients sample, positive and negative controls were pipetted onto separate circles of the disposable slide using a sample dispensing pipette. Then one drop of well mixed Carbogen reagent was added to test specimen, positive control and negative control by using the reagent dropper provided with the kit. Care was taken that the dropper tip did not touch the liquid on the slide. By using a stick, the test specimen and the Carbogen reagent were mixed thoroughly spreading

Year	Male tested	Male positives	Female tested	Female positives	Total tested	Total positives
2010	133	1(0.75%)	665	2(0.3%)	798	3(0.38%)
2011	69	0	859	3(0.35%)	928	3(0.32%)
2012	44	2(4.6%)	975	1(0.1%)	1019	3(0.29%)
2013	491	0	1160	6(0.52%)	1651	6(0.36%)
Total	737	3(0.41%)	3659	12(0.33%)	4396	15(0.34%)

Table 1. Gender wise prevalence of Syphilis

Table 2. Year wise and age wise prevalence of Syphilis

Year	11-20yrs	3	21-40yr	s	41-60yrs	3	>60 yrs		Total	
	Tested	Positives	Tested	Positives	Tested	Positives	tested	Positives	Tested	Positives
2010	26	0	488	2(0.41%)	248	1(0.40%)	36	0	798	3(0.38%)
2011	36	0	559	3(0.54%)	309	0	24	0	928	3(0.32%)
2012	49	0	594	2(0.34%)	336	1(0.30%)	40	0	1019	3(0.29%)
2013	263	0	938	3(0.32%)	408	2(0.49%)	42	1(2.38%)	1651	6(0.36%)
Total	374	0	2579	10(0.39%)	1301	4(0.31%)	142	1(0.7%)	4396	15(0.34%)

Table 3. Category wise prevalence of Syphilis

Category	Total number tested	Positives
Prenatal screening	2910 (66.2%)	9 (0.31%)
Screening of patients with suspected STD	1486 ( 33.8%)	6 (0.4%)
Total	4396 (100%)	15 (0.34%)

uniformly over the entire circle.Immediately the slide was placed on a mechanical rotator at 180 r.p.m for 8 minutes.The slide was observed for any flocculation macroscopically. A positive RPR implies that the sample is positive for syphilis. No specific treponemal tests were used for confirmation. The results were analyzed using chi-square test.

#### RESULTS

Out of the 4396 samples, 737 [16.8%] were males and 3659 [83.2%] were females. Majority of our study population comprised of antenatal screening women. Among the 4396 samples which were screened 15 [0.34%] were found to be positive for anti cardiolipin antibodies. Three of the 737 [0.41%] males and 12 of the 3659 [0.33%] females were positive [Table-1]. The difference was statistically insignificant [ $p \ge 0.05$ ].

#### DISCUSSION

In our study the prevalence was found to be low [0.34%]. and, we have not used the specific treponemal test for confirmation of diagnosis and so there may be some false positive results. Moreover the use of only one test may give a lower sensitivity [6]. The Studies from vellore district of Tamilnadu and Rengareddy district of Andra Pradesh, India have reported 0.55% and 0.12% prevalence respectively [7,8].Some reports from Tamilnadu involving 3 districts, have shown an increased prevalence of 2.7% by using RPR test[9]. Thaker et al, reported 0.7% prevalence by TPHA, in their study at Nagpur, India [10].

In our study, the prevalence of syphilis at the first prenatal visit was extremely low [0.31%]. Nidhi Nair et al in Mumbai and Parveen et al in Renga Reddy district, Andra Pradesh, India, in

their studies among pregnant women reported 0.36% and 0.10% incidence respectively [11, 12]. Studies from Saudi Arabia in year 2000 and 2007 have reported a rate of 0.7% and 0.02% among prenatal women respectively [13,14]. WHO has recommended routine antenatal screening for syphilis at first antenatal visit as early as possible in pregnancy and repeating in  $3^{rd}$  trimester to detect infection acquired during pregnancy [15], as syphilis is a major cause of abortion and poor pregnancy outcome and congenital syphilis in new born.

Our data shows significantly lower prevalence of syphilis in rural population compared to urban population. In India, there is a paucity of information regarding the prevalence of syphilis in Southern Tamilnadu. Though insignificant, the data also reveals that prevalence in females was higher compared to males. The low incidence rate of syphilis among the rural population in our study could be due to greater awareness, improved access to health care, effective control programmes and efficacious treatment.

#### CONCLUSION

Syphilis continues to be a major problem in India. Even though, the incidence is low, these findings suggest that there is greater risk behaviour among rural population of Trichy area and the sexually active females are at higher risk of contracting the syphilis infection. The control of syphilis is important for the control of HIV as well as for avoiding adverse complications between the two infections. With the discovery of dramatic therapeutic response to penicillin it was clear that it may even be possible to eradicate syphilis, as the disease has no extra human reservoir. Prevalence of syphilis in pregnant women should be screened at the first antenatal visit because the disease is treatable, and it will help to eliminate the complications of untreated syphilis.

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**ORIGINAL RESEARCH** 

#### Dr. Sukrutha Gopal Reddy

# Seroprevalence of transfusion transmissible infections among healthy blood donors at KIMS blood bank

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#### Abstract

*Background:* Safe blood is a critical component in improving health care and in preventing the spread of infectious diseases.

*Aims & Objectives:* Blood transfusion can cause the transmission of infectious to recipients. This is an important mode of infection. The aim of the study was to assess the prevalence of such type of infection among blood donors and to compare the seroprevalence of transfusion transmitted diseases in blood donors. Retrospective study was conducted for 5 years from January-2009 to December-2013 at KIMS Blood Bank, Secunderabad, India.

*Materials and methods:* All donors reporting to the blood bank during the period January-2009 to December-2013 were screened for human immunodeficiency virus (HIV) 1 & 2, hepatitis C viruses, malaria and syphilis. Screening of HIV, hepatitis B and hepatitis C viruses were done by chemillumiencies and syphilis was screened by RPR method.

*Results:* A total of 39780 voluntary blood donors were screened, of which 38697 were males and 1083 were females. Seropositivity of HIV, hepatitis B, hepatitis C viruses & syphilis were 0.26%, 1.28%, 0.51% and 0.03% respectively. No blood donors test showed positivity for malaria parasite.

*Conclusion:* With the implementation of strict donor selection criteria and use of sensitive screening test, it may be possible to reduce the incidence of TTIs.

*Keywords:* Human immunodeficiency virus; Hepatitis B virus; Hepatitis C virus; Seroprevalence; Transfusion transmitted infections

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#### Introduction

Blood transfusion, an integral part of medicine and surgery, also carries the risk of transfusiontransmissible infections like hepatitis B, hepatitis C, human immunodeficiency virus (HIV) 1 & 2, syphilis, malaria and infrequently toxoplasmosis, brucellosis & viral infections like cytomegalovirus (CMV), Epstein–Barr virus (EBV) and herpes [1] measuring their severity. World Health Organization (WHO) has recommended pre-transfusion blood test for HIV, hepatitis B (HBV), hepatitis C viruses (HCV), syphilis and malaria as mandatory [1]. All these diseases are capable of causing significant mortality, morbidity along with a financial burden for both the affected person and the country [2]. Every unit of blood transfusion there is a 1% chance of transfusion related complications including transfusion transmitted infections [1]. An increase in transfusion related infection has been reported in India [3]. India is already carrying a burden of 50 million of HBV carriers and 2,027 million of HIV cases. Keeping in mind the grave consequences of these infections and to restrain the transmission to minimum, it is very important to remain vigilant about the possible spread of these diseases through blood transfusion [4].

In our study, we aimed to estimate the prevalence of HIV, HBV, HCV and syphilis among blood donors. Accurate estimates of risks of transfusion transmitted infections (TTIs) are essential for monitoring safety of blood supply. Monitoring the incidence of TTIs in blood donors is important for estimating the risk of transfusion and optimizing donor recruitment strategies to minimize transmission. This knowledge might give us the idea of disease burden of the society and the basic epidemiology of these diseases in the community.

#### Materials and methods

A total number of 39,780 samples of blood were collected from donors from January 2009 to December 2013 at KIMS Blood Bank, Secunderabad. Donors were selected by taking history, clinical examination and also following strict donor's selection criteria to eliminate professional donors.

Samples were screened by Chemillumiences method (Architect Plus) for HIV-1 P24 antigen and anti-HIV 1 & 2 (4th generation ELISA), anti-HCV, and HBsAg Rapid Plasma Reagin (RPR) test kits (Carbogen, Tulip) are used for screening syphilis and parabank kits for screening malaria parasite. All reactive samples were labeled as seropositive, disinfected and discarded.

#### Results

In the present study, out of total 39780 blood donors, 97.2% were males and 2.73% were females, which show predominance of males as compared to females [Table 1].

The prevalence of HBs Ag, anti-HCV, VDRL, and anti-HIV among voluntary blood donors in the study population were shown in [Figure 1]. The overall seroprevalence of HIV, HBV, HCV, syphilis were 0.26%, 1.28%, 0.51% and 0.03% respectively. The highest prevalence was observed for HBV followed by HCV, HIV and syphilis in decreasing order.

Table 1: Sex wise distribution of healthy donors.

Year	Total Donors	Males (%)	Female (%)
2009	9582	9277 (96.8%)	305 (3.18%)
2010	8163	7865 (96.3%)	298 (3.65%)
2011	6699	6518 (97.2%)	181 (2.70%)
2012	7302	7175 (98.2%)	127 (1.71%)
2013	8034	7862 (97.8%)	172 (2.14%)
Total	39780	38697 (97.27%)	1083 (2.73%)



#### Discussion

Blood and blood products are an integral and life saving procedures of modern medicine, but simultaneously it carries the risk of transmitting the life threatening transmissible infectious [2]. Screening of blood is now mandatory for many diseases and it is undertaken routinely in blood banks. Transmission of TTIs during the serologically window period still poses a threat to blood safety in environments where there is high rate of TTIs [4].

Our study seroprevalence of TTIs was as follows HIV 0.26%, HBV 1.28%, HCV 0.51% and syphilis 0.03%. No Blood donor test showed positivity for malaria parasite. The present study revealed overall prevalence of HIV seropositivity was 0.26%, which was similar to findings by Rajvir Singh et al. (0.25%) [2], Das BK et al. (0.32%) [5], Arora D et al. (0.3%) [6] and Patel SV et al. (0.30%) [7]. Variable results of 0.01% [8], 0.1% [9] and 0.64% [10] have also been reported in various other studies.

Present study revealed seroprevalence of HBV at 1.28% was lower than that reported by other studies by Arora D et al. (1.7%) [6], Sinha SK (2.27%) [10], Garg S (3.44%) [11], Nilima sawke (2.9%) [12], whereas few studies reported lower level of prevalence Arumugam et al. (0.74%) [8] and Luna Adhikari et al. (0.78%) [13].

HCV infection is an evolving public health problem globally. For hepatitis C, the estimated prevalence in this study was 0.51% familiar reported by Nilima Sawke et al. (0.57%) [12], yet another set of studies reported 1.0%, 0.23%, 0.35% by Aora D et al. [6], Pallavi et al. [14] and Das BK [5] respectively.

In this study, syphilis positivity was 0.03%, which are similar with the study done by S.T. Arumugam et al. [8] i.e. 0.03% whereas other studies reported 0.25%, 0.35%, 0.9%, 0.62% by Sangita Patel et al. [7], Das BK et al. [5], Arora D et al. [6] and Rajvir Singh et al. [3] respectively.

#### Conclusion

The time and cost involved in screening donated blood can be reduced by an effective donor education and selection criteria. Blood is still one of the leading risk factor of spread of the TTIs i.e. HIV, hepatitis B, hepatitis C viruses and syphilis.

#### **Conflict of interest**

The authors declare no conflict of interest.

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Trinocular Inverted microscope at KFRC

#### **ORIGINAL ARTICLE**

# TRENDS OF DIFFERENT SEXUALLY TRENSMITTED DISEASES IN A STD CLINIC OF A TERTIARY CARE HOSPITAL: COMPARISON BETWEEN VIRAL ORIGIN AND BACTERIAL ORIGIN STDS

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## ABSTRACT

**Background:** STDs (sexually transmitted diseases) are as old as diseases of great antiquity. At particular point of time and place, prevalence of STDs is cumulative result of sexual behaviour, tendency, awereness, interventions and immunological factors among concerned population.

**Aims:** An attempt has made to know the current trend of STDs in the time of global emergence of HIV (the human immunodeficiency virus) by a prospective study.

**Methods and Material:** From patients attending STD clinic of a tertiary care hospital, 150 consecutive patients having clinically diagnosed STDs were included in the study. Along with clinical diagnosis, all the patients' history and blood sample were collected. Sera were tested for the screening for HIV anti body and RPR (rapid plasma reagin) test. Data collected from this study is analysed here.

**Results:** Out of 150 total STD clinic attendants, 23.33% were HIV positive and only 4% were found positive for RPR test. Occurrence of more number of viral STDs (e.g. herpes genitalis, genital warts molluscum contagiosum) is noted as compare to others. The increase of viral origin STDs is observed in both the group-HIV positive group and non-HIV one.

**Conclusions:** Like any other infectious diseases, STDs are changing their trends as time passes. Regular prospective studies should be done to monitor the current changes in STDs and try to evaluate the responsible factors. To pick up the changes at correct time will be helpful for proper implementation of preventive and curative management.

Key words: STD, HIV, RPR, Viral, Baterial

#### **INTRODUCTION**

Sexually transmitted diseases (STDs) are a global health problem of great magnitude. The pattern of STDs differs from country to country and from region to region, especially in large countries such as India. STDs have severe and sometimes deadly consequences. These Diseases add billions of money to the healthcare costs each year.<sup>1</sup> Despite the fact that STDs are extremely widespread, most people remain unaware of the risks and consequences of all but the most prominent STD – HIV. <sup>2</sup> The spread of HIV infection in India is predominantly by heterosexual route and the prevalence of HIV infection among persons suffering from various STDs is on rise.<sup>3</sup>

There are no accurate statistical data on the morbidity and mortality rates due to STD in India as a whole, although the attendance of patients with STD at the larger hospitals, gives some idea of the situation.<sup>1</sup> While extremely common,STDs are difficult to track. Many people with these infections do not have symptoms and remain undiagnosed. Even diseases that are diagnosed are frequently not reported and counted. These "hidden" epidemics are magnified with each new infection that goes unrecognized and untreated.<sup>2</sup>

In this study, the trend of STDs in STD clinic is presented with the special concern over the viral or bacterial origin of the STD.

#### MATERIALS AND METHODS

The present study was conducted at STD clinic of B.J.Medical college and civil hospital Ahmedabad. The study groups comprised of 150 consecutive patients

having clinically diagnosed STD. Participants were examined for various STDs. A standard protocol was used to assess the medical history. Blood specimens were obtained and sera tested for anti HIV antibody using NACO guideline. <sup>4</sup> First ELISA was performed using Recombigen HIV-1/HIV-2 EIA kit (Enzaids by span diagnostic ltd, Surat) and Sera positive by first ELISA were retested by Immunocomb II HIV 1 and 2 and SD BIO HIV-1 /HIV-2 Assay (SD BIO Standard Diagnostics India) for confirmation. The sera were also screened for syphilis by RPR test (Carbogen, tulip diagnostic; Verna Goa) for the detection of anti lipoidal antibodies.

#### RESULTS

Out of 150 patients having STDs, 98 male and 52 female patients were included in the study for detecting a trend of STDs in STD clinic. These 150 patients were also screened for anti HIV antibody and rapid plasma reagin antibody to find out sero-epidemiological trends of HIV and syphilis. Out of 150 patients, 35 (23.33%) and 6 (4%) were positive for anti HIV antibody and rapid plasma reagin antibody respectively (Table 1).

 Table 1: Various STDs distribution among male

 and female patients

STDs	Total	Male	Female	Anti	RPR
				HIV Ab	Positive
				positive	
Herpes	65	49	16	12	1
Genital wart	25	18	7	7	1
Molluscum	10	3	7	3	0
contagiosum					
Balanitis	6	6		1	0
Cervicovaginal	15		15	4	0
dischage					
Syphilis	5	5	0	2	2
Chancroid	3	2	1	0	1
Gonorrhea	3	2	1	2	0
Undiagnosed	18	13	5	4	1
STD/others					
Total	150	98	52	35	6

Overall 65 (43.33%) cases diagnosed as genital herpes were highest in both sex group.-50% and 30.8% in male and female patients respectively. Among male patients, other STDs in descending order were genital wart 18 (18.4%), undiagnosed/others STD 13 (13.3%), balanitis 6 (6.1%), syphilis 5 (5.1%) molluscum contagiosum 3 (3.1%), gonorrhea 2 and chancroid 2 (each 2%). Among female patients, other STDs in descending order were cervico - vaginal discharge 15 (28.8%), genital wart 7 (13.5%), molluscum contagiosum 7 (13.5%), undiagnosed STD 5 (9.6%), gonorrhea 1 and chancroid 1 (each 1.9%). (Table 1)

#### Table 2: STD in HIV positive patients

STDs in Anti HIV Ab positive	Total	Male	Female
Genital herpes	12	10	2
Genital wart	7	7	0
Molluscum contagiosum	3	0	3
Balanitis	1	1	
Cervicovaginal dischage	4		4
Syphilis	2	2	0
Gonorrhea	2	1	1
Undiagnosed STD	4	4	0
Total	35	25	10

The Distribution of STDs in HIV antibody positive are shown in Table 2. There is no significance difference between the HIV positive and HIV negative STD clinic patients (for all diseases, chi-square value <3.84, p>0.05). However, there was more cervico vaginal discharge than genital herpes among female group (Table 2).

Though there was not kept any bar for patients' age to reflect the current burden of STDs in the community as a whole, during this study patients encountered were majority of age group ( > 95%) were between 15 - 49 years for the both sex.. Very few patients of above 49 years were founded and included in the studies. This data also shows that majority of the disease are presented before the age of 30 year. (Table 3 and table 4)

#### DISCUSSION

In our study, patients attending STD clinic had shown large number of genital herpes and small number of syphilis and chancroid .Most early studies of STD in developing countries identified syphilis and chancroid as the main causes.

Τ	able	3:	Age	wise	distribu	tion o	of STDs	among	male	patient	s
			0							1	

Age group	Case	Anti HIV Ab positive	HER*	G.W†	<b>M.C.</b> ‡	BAL§	SYP.	GON**	UND††
15-19	4	0	2	1	0	1	0	0	1
20-24	19	2	7	4	2	0	2	1	1
25-29	14	4	11	2	0	0	0	0	1
30-34	17	9	9	3	0	3	1	1	3
35-39	17	4	6	3	0	1	1	0	3
40-44	13	5	7	2	1	1	0	0	3
45-49	9	1	5	1	0	1	1	0	0
>=50	5	0	2	2	0	0	0	0	1
Total	98	25	49	18	3	7	5	2	13

Age group	Case	Anti HIV Ab positive	HER. *	G.W†	<b>M.C.</b> ‡	CVD. ‡‡	GON**	UND††
15-19	4	0	2	1	0	0	0	1
20-24	14	3	6	1	0	6	0	1
25-29	7	2	1	1	2	3	0	0
30-34	12	3	2	2	3	4	1	0
35-39	6	1	2	1	0	1	0	1
40-44	5	1	3	0	1	0	0	1
45-49	4	0	0	1	1	1	0	1
>=50	0	0	0	0	0	0	0	0
Total	52	10	16	7	7	15	1	5

Table 4: Age wise distribution of STDs among female patients

**Table 3 & 4**: \*HER –Herpes; †G.W.-Genital wart; ‡M.C.-Molluscum contagiosum; §BAL- Balanitis; ||SYP-syphilis;\*\*GON-Gonorrhea; ††UND- Undiagnosed STD.

There are few references to genital herpes until studies investigating the etiology of GUD (genital ulcerative disease) in the early 1980s. Clinical cases of genital herpes even merited publication as case reports in the 1970s. 5In Asia; chancroid was usually the most prevalent cause of GUD in most early studies. However, by the early 1980s genital herpes accounted for 17% of genital ulcers and 11% of purulent genital lesions in Singapore, 6and 12% in Bangkok. 7 The spread of HIV since the 1980s and subsequent behaviour change have resulted in significant alterations in STI (sexually transmitted infection) epidemic patterns in which the relative importance of genital herpes has increased in many countries. The most noticeable example of this phenomenon has been in Thailand where the incidence of chancroid and syphilis was reduced from nearly 39 000 and 11 855 cases in 1987 to 1990 and 3645 respectively in 1993. In Singapore, genital herpes (72%) is now by far the most common cause of GUD followed by chancroid (16%) and syphilis (3%).8 In Kuala Lumpur, Malaysia, HSV-2 was identified by culture and immunofluorescence in 19% and H ducreyi in 9% of STD clinic at tenders with GUD.9A survey of five STD clinics in Papua New Guinea identified genital herpes, diagnosed clinically, as the most common cause of GUD.<sup>10</sup> In a population of HIV positive Africans living in London followed up for a mean of 14 months, 42% developed genital herpetic lesions.11In Africa, increased access and availability of HSV-2 antibody tests have confirmed significant prevalence of HSV infection in Africa. Where, since the 1970s, the prevalence of HSV-2 in the general population increased by 30% to levels of 26% in women and 18% in men in 1988-94. Genital herpes is also a significant problem in central and South America. HSV-2 type specific antibodies were detected in 61% of Commercial sex workers in Mexico City, 12 53% of STI patients in Caminos City, Brazil, 13

In India, in Chandigardh, a fourfold increase in genital herpes was observed in STD clinic attendees from 1977 to1990<sup>14</sup> A more dramatic increase can be observed in the increased prevalence of HSV detected by culture in men with GUD in Durban from 7% in 1984<sup>15</sup> to 10% in 1989 and 40% in 1998.<sup>16</sup> It is not known whether these raised HSV rates are just in HIV positive cases or also in HIV negative cases (which might imply an

overall increase in HSV transmission secondary to the HIV epidemic). <sup>17</sup>retrospective data analysis of different STDs in North Eastern (NE) India during 1995 - 1999., revealed a sharp decline in the incidence of syphilis, chancroid, GONO, whereas a conspicuous upward trend in genital wart.<sup>18</sup>

This study shows that in female, age group 20-34 have more number of patients, It shows that is age of active sexuality and chance of getting STD is high. After this age, numbers of STDs are gradually decreased, this may be due to getting partial immunity against STD After age of 50, not a single case of active STD has been founded during this study, and this is probably not due to immunity but due to decreased sexual activity as age advances.

Trend of STDs in our population from the previous study <sup>20</sup> has been compared with this study Chart 1 and Table 5.

Table	5: Preval	ence of	different	STDs	in an	earlier
study	(2001-200	5) and j	present st	udy		

	Earlier Study	Present Study
HIV	7.34	23.33
STDs		
Herpes	32.37	43.33
Genital wart	10.09	16.67
Molluscum contagiosum	5.11	6.67
Balanitis	1.57	4.00
Cervicovaginal dischage	13.76	10.00
Syphilis	14.29	3.33
Chancroid	9.04	2.00
Gonorrhea	10.88	2.00
Undiagnosed /others STDs	2.89	12.00

#### CONCLUSION

We know some disease of non-communicable type have shown their secular trends in which their frequency of occurrence among community changes with the time due to some known and unknown reasons. Similarly, history of infectious disease (e.g. leprosy, tuberculosis.) also shows changing pattern.<sup>19</sup>

Therefore, time-to-time studies from the different regions must be done to know the changes and so that an attempt can be made for their proper management. The disease those were found in earlier days of STD clinic has changed their pattern in occurrence. Further studies should be done regarding the strain of microorganism causing the diseases to know the changes taking place at microorganism level.

Some conclusions have been put forward from this study.

- 1) Decrease in syphilis prevalence (as lower rate of syphilis found clinically as well as serologically by RPR) as compared to earlier studies.
- 2) Trends of STD are more toward viral origin (e.g. genital herpes, warts or molluscum contagiosum) as compare to bacterial origin (e.g. syphilis, chancroid). This is probably due to the fact that most of the bacterial and treponemal STDs are treated at the primary level by virtue of large number of currently available antibiotics and these organisms are responding to antibiotics.
- 3) There is no statically significance difference in any type of STD among patients of HIV positive and HIV negative groups. This suggest that majority of STDs' microorganisms are wide spreaded in community asymptomatically. Non-HIV group has been also encountered with them. so effective barrier contraceptive measures are very much in need today. Moreover, increased rate of self reporting by patients in the propaganda era could have also played a role in the observed trend.

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# The Evaluation of Blood Donor Deferral Causes: A Tertiary Care Centrebased Study

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#### Abstract

Blood safety is a major issue all over the world in transfusion medicine. For this, donor selection is necessary in addition to the screenings of blood bags for infectious diseases. Deferrals lead to loss of precious blood/ components available for transfusion. For preventing this, we should be having knowledge of causes of deferral and their frequency. In this study, causes of donor deferral were evaluated retrospectively from January 2007 to December 2011 in the blood bank of Jawaharlal Nehru Medical College (JNMC), Aligarh Muslim University (AMU), ALIGARH (India). Analysis of the deferrals showed that temporary deferral was more common than permanent deferral. Most common cause in permanent deferral was HBsAg positivity. Causes among temporary deferral were anemia (Hb<12.5 gm%), malaria in last 3 months, jaundice, alcohol intake in last 3days, weight <45 kg, age <18 yrs, patients on antibiotic, previous donation in last 3 month, typhoid in last 1 year, dog bite etc.

Keywords: Blood donor; Deferral; Blood safety

#### Introduction

In current medical and surgical practice, a blood transfusion can be a vital, life-saving procedure. But it requires an adequate supply of safe blood from a healthy donor. For this, donor selection is necessary in addition to the screenings of blood bags for infectious diseases. However deferrals lead to loss of precious blood/components available for transfusion. For preventing this we should be having knowledge of causes of deferral and their frequency. The National AIDS Control Organization's (NACO) statistics show that the annual rate of blood donation in India is about 7.4 million units, against the requirement of 10 million units [1]. According to World Health Organization (WHO) figures, over 81 million units of blood are collected annually worldwide but only 39% are collected in developing countries which have 82% of the world's population [2]. A blood bank plays an important role in ensuring the supply of safe blood as and when required. While it is important to ensure that there is an adequate supply of blood, it is also essential that the blood collection process does not harm either the donor or the recipient. This is achieved by having donor deferral criteria [3] and stringent screening of collected blood for possible Transfusion Transmissible Infections (TTIs) [4]. Deferrals are divided into permanent and temporary. Few studies done in India in the past have provided different common reasons for deferral of whole blood donors, highlighting differing demographic profile in different parts of the country [5,6]. The aim of our study is to know the profile of the blood donors and causes of the permanent and temporary deferral and their frequency. This retrospective study was conducted in the blood bank of JNMC, AMU, Aligarh (India) from January 2007 to December 2011

#### Materials and Methods

This retrospective study included all the donors reporting for blood donation in the blood bank of JNMC, AMU, Aligarh (India) from 1<sup>st</sup> January 2007 to 31<sup>st</sup> December 2011. The donors were evaluated on the basis of clinical history, physical examination, Hb estimation, blood pressure, and temperature. NACO guidelines were used for deferral of blood donors. Data was collected from the records maintained by the blood bank. Hemoglobin was measured by Haemometer Sahli

plano paralal (Toptech biomedicals, Thane, India). Blood samples of these donors were screened for HBsAg by Microscreen HBsAg ELISA Test kit (NACO supplies, Third National HIV/AIDS Control Project, Span diagnostics limited, India) and anti HCV by SD HCV ELISA 3.0 the 3rd Generation Anti-HCV ELISA test (NACO supplies, Third National HIV/AIDS Control Project, SD Bio standard diagnostics private limited, India), anti-HIV by SD HIV1/2 ELISA 3.0 the 3rd generation Anti HIV1/2 ELISA test (NACO supplies, Third National HIV/AIDS Control Project, SD Bio Standard Diagnostics Private limited, India), Malaria by SD Malaria Ag Pf/Pan (SD Bio Standard Diagnostics Private Limited, Gurgaon, Haryana, India) and syphilis by CARBOGEN, RPR card test (Tulip diagnostics private limited, India) from 2007 to 2010 and in 2011 by SD BIOLINE syphilis (Bio standard diagnostics private limited, Gurgaon, Haryana, India) a solid phase immunochromatographic assay for the qualitative detection of antibodies of all isotypes (IgG, IgM, IgA) against Treponema pallidum antigen.

#### Result

Out of 53,950 people who had come for blood donation, 51,266 were males (95%) and 2,684 were females (5%) (Table 1). 6,690 donors (12.4%) deferred out of which 4,262 (63.7%) were temporary and 2,428 (36.3%) were permanent (Table 2). Overall males (6,142; 11.38%) were deferred more than the females (548; 1.02%) but females (548; 20.41%) were found to have higher deferral rate among the female donors than males (6,142; 11.98%) (Table 3). Analysis of the deferrals showed that the temporary deferral was more common than permanent deferral.

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	No. of registrations	No. of deferrals	% deferrals of total registration
Male	51266	6142	11.38%
Female	2684	548	1.02%
Total	53950	6690	12.40%

Table 1: Demographic profile of the donors.

	No. of deferrals	% of total deferrals	% deferrals of total registration
Temporary	4262	63.7%	7.90%
Permanent	2428	36.3%	4.50%
Total no. of deferrals	6690 (12.4% of total registration)	100%	12.40%

Table 2: Frequency of permanent and temporary deferrals.

	No. of donations	No. of deferrals	% of deferrals among male/female donors
Male	51266	6142	11.98%
Female	2684	548	20.41%

**Table 3:** Frequency of deferrals among male and female donors.

Most common cause among temporary deferral was anemia (Hb <12.5%), followed by malaria in last 3 months (Table 4). Most common cause in permanent deferral was HBsAg positivity followed by age >60 yrs (Table 5).

#### Discussion

Donor selection has vital importance in blood banking and transfusion medicine. The preamble of our study was to device a protocol which could prevent the loss of whole blood/component and be safe for the donors and recipients.

Most of the donors were males (95%); women accounted for only 5% of the donors. Present study showed that female donors (20.41%) were deferred more frequently than male donors (11.98%) which might be due to wide prevalence of anemia in female donors.

Donor deferral (12.40%) in the study was very much similar to various American, European and Asian studies. Zou et al. [6] reported a deferral rate of 12.8% in their 6 years study of American Red Cross blood service and Custer et al. [7] showed a deferral rate of 13.6%. In a European study conducted by Lawson-Ayayi and Salmi [8], 10.8% of donors were deferred. Arslan [9] reported a donor deferral rate of 14.6% in Turkish donors. Lim et al. [10] reported a deferral rate of 14.4% in Singapore (Asia) and Bahadur et al. [4] reported 9% in Delhi (India). Rabeya et al. [11] found a very low deferral rate in their study (5.6%) which could be due to different donor selection criteria.

The most common cause among temporary deferral was anemia (17.95%) as compared to Halperin et al. [12] which showed low hemoglobin as the most common cause in 46% of the temporary deferral. The study done by Arslan [9] in Turkish donors showed low hemoglobin as the most common cause of deferral in 20.7% of overall deferral. The findings in our study were very much similar to these studies. Malaria accounted for second most common cause of temporary deferral which might be due to the fact that Aligarh city and its surroundings from where most of the donors received were in endemic zone. This finding is not reported in any of the previous studies, due to the fact that most of the studies were conducted in non endemic zones of malaria. The incidence of malaria can be decreased if the breeding of mosquito is controlled by organizing educational programs regarding the control of mosquito breeding as well as by upgrading the malaria control programs in these endemic zones by the government. Anemia can be cured if proper treatment of these donors

Causes	Number	% Temporary deferrals	% Total deferrals
Anemia, Hb <12.5%	765	17.95%	11.43%
Malaria in last 3 month	505	11.85%	7.54%
Weight <45 kg	454	10.65%	6.79%
Jaundice last 1 year	390	9.15%	5.83%
Alcohol in last 72 hrs	380	8.92%	5.68%
On antibiotic/ aspirin for last 3 days	279	6.55%	4.17%
Upper respiratory tract infection	251	5.90%	3.75%
Age < 18 years	200	4.70%	3.00%
Previous donation in last 3 months	171	4.01%	2.56%
Syphilis for 1 month	164	3.85%	2.45%
Hypertension	140	3.29%	2.09%
Typhoid in last 1 year	128	3.00%	1.91%
Dental extraction/surgery in last 6 month	120	2.80%	1.80%
Diabetes on insulin	110	2.58%	1.64%
pregnant/lactating female	90	2.10%	1.35%
H/O Tuberculosis with no ATT intake/ incomplete treatment.	51	1.20%	0.76%
Dog or cat bite/rabies vaccination in last 1 year	43	1.00%	0.64%
Poor vein	9	0.20%	0.13%
Stroke	4	0.10%	0.06%
Tattoo /ear piercing in last 1 year	4	0.10%	0.06%
Bhang addiction	4	0.10%	0.06%
	4262	100%	63.70%

Table 4: Causes of temporary deferrals with their relative proportions.

Causes	Number	% Permanent deferrals	% Total deferrals
HBV positive	1571	64.70%	23.48%
Age >60 years	276	11.37%	4.13%
HCV positive	169	6.96%	2.53%
Chronic obstructive lung disease	110	4.53%	1.64%
HIV-1,2 positive	96	3.95%	1.43%
Heart disease	90	3.71%	1.35%
Asthma	70	2.88%	1.05%
Epilepsy	30	1.24%	0.45%
leukemia/lymphoma/multiple myeloma	10	0.41%	0.15%
patient who received chemotherapy	6	0.25%	0.09%
	2428	100%	36.3%

**Table 5:** Causes of permanent deferrals with their relative proportions.

is undertaken with follow up. The other causes of temporary deferral included low body weight, upper respiratory infection, syphilis, jaundice and others which are easily curable. A proper track for follow up of temporarily deferred donors regarding their management should be made in the blood bank so that these donors can be recruited back in donors' pool.

In our study 36.3% of donors were deferred for permanent reasons. Our findings (36.3%) were much higher than Custer et al. [7] who reported a permanent deferral rate of 10.6% and Arslan [9] who reported a rate of 10%. This high frequency was due to the inclusion of transfusion transmissible infection in our study especially Hepatitis B infection (HBV) which was not studied thoroughly in the above mentioned publications. Present study showed HBsAg positive as the most common cause of permanent deferral as compared to Bahadur

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et al. [4] who showed Hypertension as the most common cause. The method used for Hepatitis B testing as mentioned in material and method detect HBsAg positivity, indicates that either the donor had a subclinical disease/acute or chronic viral infection/false positive cases. So for the benefit of the patients these donors were deferred permanently. This is very important finding which should be of great concern as Hepatitis B infection is increasing more among the local population and knowledge of routes of transmission of TTI can decrease the seroprevalence of Hepatitis B infection, further this infection can be controlled by vaccination which should be encouraged. Public awareness programs relating to routes of transmission for these infections should be encouraged.

#### Conclusion

The present study showed that although donor deferral rates were very much similar in different populations, the reasons for deferral differ, reflecting difference in socioeconomic status and environment. However, some studies showed different deferral rate which could be due to different donor selection criteria. Analysis of deferral patterns may help medical personnel and doctors to be more focused in donor screening especially of those who are having higher frequency e.g., Anemia, Malaria and Hepatitis B infection. Temporary deferred donors require proper follow up and management so as not to lead to a diminished supply of future donors. Government establishment need proper attention to control malaria. For this prevention of mosquito from breeding is needed. Hepatitis B infection can be prevented by educating people regarding the importance of Hepatitis B vaccination and routes of transmission. Finally, the approach to improve safety of blood and blood products and to decrease loss of precious blood/ component must include four steps: (1) detail history based on NACO/ WHO guidelines, (2) physical examination, (3) laboratory tests including ELISA for anti HIV, anti HCV and HBsAg and other test for malaria and syphilis and (4) public awareness programmes.

So to conclude, it is important to determine the rate and causes

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of blood donor deferral for the safety of blood/component transfusion and also to guide the recruitment efforts to prevent loss of precious blood/components at local, national and international levels.

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# Prevalence and patterns of transfusion transmissible infections among blood donors in Sri Ganganagar, Rajasthan, India: - A retrospective study

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#### Abstract:

Acquisition of transfusion transmissible infections in the process of therapeutic blood transfusion is a major global health challenge in transfusion medicine. The prevalence of seropositivity among blood donors was evaluated in a 4 year retrospective study from 2007 to 2010 conducted at Purohit blood bank, Sri Ganganagar, Rajasthan, India. Donors were evaluated for the prevalence of HCV, HBV, HIV and syphilis. A total of 21399 healthy blood donors were tested, out of which 7711 (36.03%) were replacement donors and 13688 (63.96%) were voluntary donors. Males formed the bulk of the donor population (92.71%). The prevalence of HCV, HBV, HIV and syphilis was 0.82% (ranging from 0.23% in 2008 to 1.37% in 2010), 0.79% (ranging from 0.32% in 2008 to 1.03% in 2010), 0.14% (ranging from 0.09% in 2007 to 0.20% in 2010) and 0.50% (ranging from 0.21% in 2008 to 0.61% in 2009) respectively. Our study underscores the increasing endemicity of TTIs in our community and the need for a sensitive screening algorithm of blood donations to improve blood safety.

Keywords: : HIV, HBV, HCV, syphilis, seroprevalence, transfusion transmitted infections (TTIs).

### Introduction:

Acquisition of transfusion transmissible infections in the process of therapeutic blood transfusion is a major global health challenge in transfusion medicine. No effort should be spared at reducing this complication to the barest minimum. HIV, HBV and HCV are of great concern because of their prolonged viraemia and carrier or latent state <sup>[1]</sup>.Syphilis is also a systemic disease caused by T. pallidum which can be spread by sexual contact, blood transfusion and via vertical transmission [2]. Not only are these infections associated with long term morbidity and mortality but also there is a grave risk of transmission of these infections to others <sup>[3]</sup>. It is therefore important to monitor the trend in the prevalence of transfusion transmissible infections (TTIs) so as to assess the risk of TTIs in our pool of donors, and by inference, the risk in the general population receiving such blood.

Available data at Rajasthan state level on the seroprevalence and distribution of these blood borne pathogens is limited. The current study conducted at Purohit blood bank, situated in the heart of Sri Ganganagar city, therefore looks at the prevalence and trends of HIV, HBV, HCV and syphilis among healthy blood donors in Sri Ganganagar, Rajasthan over a period of four years (2007-2010). This study shall draw attention towards the magnitude of the viral transmission in the Rajasthan community so that effective action can be taken to prevent further transmission of diseases via blood transfusion and also provide a reference for future studies.

The study was done at Purohit Blood Bank, Sri Ganganagar, and Rajasthan over a period of four years (2007-2010). All

blood donations collected over this period were included. The donors were either voluntary or replacement donors. The voluntary donations were taken in the blood bank or at voluntary blood donation camps, mostly organized by clubs, colleges, political parties, religious organizations etc. Replacement donors were either relatives or friends of patients. The donors were required to fill our donor screening registration form as part of a routine blood donation screening procedure. All samples were screened for Hepatitis B surface antigen (HBsag ERBA LISA Hepatitis B), Anti HIV antibodies (HIV third generation kit, ERBA LISA HIV 1+2), Anti Hepatitis C virus antibodies (ERBA LISA Hepatitis C) and Rapid plasma Reagin (RPR) reactivity (Carbogen kit, Tulip diagnostics). The total number of seropositive cases and their distribution were noted.

A total of 21399 healthy blood donors were tested during the study period. The total number of blood donations has shown a progressive increase from 3232 donors in 2007 to 8441 donors in 2010. Out of the total donations 7711 (36.03%) were replacement donors and 13688 (63.96%) were voluntary donors. The percentage of voluntary donations has also increased during the study period from a mere 30% in 2007 to 87% in 2010. Males formed the bulk of the donor population (92.71%). We evaluated the annual prevalence of HCV, HIV, HBV and syphilis in our blood bank. The prevalence of HCV, HBV, HIV and syphilis was 0.82% (ranging from 0.23% in 2008 to 1.37% in 2010), 0.79% (ranging from 0.32% in 2008 to 1.03% in 2010), 0.14% (ranging from 0.09% in 2007 to 0.20% in 2010) and 0.51% (ranging from 0.21% in 2008 to 0.61% in 2009) respectively. The increasing trend in prevalence is significant for HBV and HCV (p<0.001) but the same is not true for HIV and syphilis.

Safe blood is a universal right, which means that blood which will not cause any harm to the recipient and that has been fully screened and is not contaminated by any blood borne diseases such as HIV, Hepatitis, malaria and syphilis. Unsafe blood remains a major threat for the global spread of TTIs <sup>[4]</sup>. In general, blood donors are members of a low risk behavioral group. The prevalence of TTIs among blood donors therefore allows for assessment of epidemiology of these infections in the community. We examined the occurrence of HIV, HBV, HCV and syphilis infection among blood donors in Sri Ganganagar, Rajasthan by serological methods and compared the results to assess the trends in four consecutive years (Jan 2007-Dec 2010).

The various studies have shown that replacement donors constitute the largest group of blood donors in India [5,6]. A low proportion of voluntary donors could be a reflection of lack of awareness amongst the general public, presence of misconceptions and fears associated with donating blood and the indifferent attitude of the health sector. In the initial part of our study replacement donors far outweighed the voluntary donors but when the Central and the Rajasthan state government launched the voluntary blood donation programme which was strictly implemented, it has resulted in the increase in the voluntary donations. While in the year 2007 merely 30% constituted voluntary donors, the proportion has increased to 83% in the year 2010. This continual rise in the percentage of voluntary donations as evident from our study is very heartening and encouraging. Similar trends are seen in other studies as well [7]. Still the need to shift the burden to 100% voluntary donations cannot be overemphasized, also because they are safer and thus advocated.

During 2006-2009, males formed the bulk of the donor population (94-99%). However, the year 2010 has seen an increase in the percentage of female donors (13.15%). The women have voluntarily donated blood largely in the blood donation camps organized by different clubs, religious organizations, banks, offices and political parties. This changing trend is again very heartening and may also eventually further increase the voluntary donation drive.

The ideal sample for any seroprevalence study is a sample from the general population. Since community based seroprevalence studies are difficult to conduct in a developing country, prevalence among healthy blood donors is often used as a surrogate marker <sup>[5,8]</sup>. But the blood donor population which is largely made up of young adults may not be able to give true estimates regarding prevalence in children, elderly and the females. The increasing number of female donors as evident in our study could actually correct the skewed scenario and give a more accurate picture.

The seroprevalence of HCV in our study was 0.82 % ( ranging from 0.23% in 2008 to 1.37% in 2010). There is a wide variation in the HCV seroprevalence in different studies in India. This may be due to the use of different generation of ELISA test kits having different sensitivities and specificities. While similar rates have been reported from Chandigarh <sup>[7]</sup>, relatively higher prevalence rates have been reported from a hospital based study in Cuttack, Orissa, Jaipur and New Delhi <sup>[9,10,11]</sup>. Garg et al. reported a lower HCV prevalence of 0.28% in blood donors in Jodhpur during the study period 1994-1999 <sup>[12]</sup>. These variations could also be due to actual changes in population risks or effectiveness of donor screening measures.

Prevalence of HBV in our blood donor population was found to be 0.79 %( ranging from 0.32% in 2008 to 1.37% in 2010). The prevalence rates reveal a steep decline in 2008 followed by a gradual rise till 2010. A hospital based study conducted in Jaipur has revealed a similar Hbsag prevalence <sup>[8]</sup>. Higher prevalence rates have been reported from Chandigarh and New Delhi <sup>[5, 7]</sup>. Similar increasing trends are also evident in another contemporary study conducted in West Bengal <sup>[1]</sup>. The upward rising trend calls for continued stringent measures in donor recruitment, especially in their social behaviour and for the clinician to transfuse only when absolutely necessary.

In the present study seroprevalence of antibodies to HIV is 0.14 % (ranging from 0.09% in 2007 to 0.20% in 2010). This is considerably lower than the estimates of NACO (National AIDS Control Organization), NIHFW (National Institute of Health and Family Welfare) and NMS (National Medical Statistics)<sup>[13]</sup>. Relatively higher prevalence rates have been reported from other studies conducted in Chandigarh, West Bengal and New Delhi<sup>[1,7,14]</sup>.The consistent low levels of HIV prevalence are probable indicative of the fact that the efforts of both the various governmental and nongovernmental organizations are probably yielding good results at reducing the scourge of HIV/AIDS in Rajasthan.

The seroprevalence of syphilis in our study is 0.51 %( ranging from 0.21% in 2008 to 0.63% in 2010). There is again a considerable variation in the prevalence rates of syphilis reported from different studies which may be due to differences in risk behavior patterns. While similar rates are reported from Delhi <sup>[13]</sup>, relatively higher rates have been reported from Chandigarh and West Bengal <sup>[1, 7]</sup>.

This is the first report defining rates of TTIs among blood donor population in Sri Ganganagar, Rajasthan. The study underscores the increasing endemicity of these infections in the community. Simultaneous increase in HIV, Hepatitis and syphilis infections may be explained by epidemiological similarity between the respective causative agents, similar routes of transmission and also association with high risk behavior. The results are a reflection of the problem of unnoticeable infections in healthy looking members of the general population. Only continuous improvement and implementation of donor screening can ensure a decline in the risk of acquiring TTIs. Also there is an urgent need to sensitize and mobilize the society to donate blood to help their brethren.

able 1: Trends in voluntary and replacement donors and gender distribution during the study period									
YEAR	TOTAL	REPLACEMENT	VOLUNTARY	MALES	FEMALES				
	DONATIONS	(%)	(%)	(%)	(%)				
2007	3232	2261	971	3192	40				
		(69.95)	(30.04)	(98.76)	(1.23)				
2008	5175	2517	2658	5039	136				
		(48.63)	(51.36)	(97.37)	(2.62)				
2009	4551	1505	3046	4278	273				
		(33.06)	(66.93)	(94.00)	(5.99)				
2010	8441	1428	7013	7331	1110				
		(16.91)	(83.08)	(86.84)	(13.15)				
TOTAL	21399	7711	13688	19840	1559				
		(36.03)	(63.96)	(92.71)	(7.28)				

Table 2: Donor screening- number and percentage seropositive for the TTIs

YEAR	TOTAL DONATIONS	HBV (%)	HCV (%)	HIV (%)	RPR (%)
2007	3232	44 (1.36)	15 (0.46)	3 (0.09)	18 (0.56)
2008	5175	17 (0.32)	12 (0.23)	5 (0.10)	11 (0.21)
2009	4551	23 (0.50)	33 (0.72)	6 (0.13)	28 (0.61)
2010	8441	87 (1.03)	116 (1.37)	17 (0.20)	54 (0.63)
TOTAL	21399	171 (0.79)	176 (0.82)	31 (0.14)	111 (0.51)

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Conflict of Interest: - None Source of funding: - Not declared Corresponding Author:-Dr. Niraj Kumar Biswas., M.B.B.S, MD (Microbiology), Assistant professor Microbiology deptt, Jhalawar medical college, Jhalawar (Rajasthan), India.

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#### Letter to Editor

# Low seroprevalence of blood-borne infections among supposedly high-risk police personnel

Dear Editor,

As health care workers, police personnel, who are usually first responders to any casualty, have the potential for occupational exposure to blood, which increases their risk for occupational blood-borne infection.<sup>[1]</sup> A higher prevalence might be seen in this group when compared to the general population because of the following points:

- 1. They are usually first responders in casualties thereby increasing their exposure rates.
- 2. There is frequent unexpected change of location among these officers. It is not always convenient or possible for the police officers to move their family with them to their new locations. This frequent transfer encourages police officers toward extramarital affairs and multiple sexual partners.
- 3. Police work has been identified as one of the most stressful professions. Love making, especially through extra-marital relations, may be one of the coping mechanisms.
- 4. The shifting nature of police work causes discontent in their family life, which further encourages the extramarital relations.<sup>[2]</sup>

To address this concern, the authors conducted a literature review of occupational blood exposures and the seroprevalence of blood-borne pathogens among this group. An MEDLINE search was conducted, and all identified articles that described surveys of exposures to blood or surveillance of blood-borne infections among police personnel were included. To the best of our knowledge and belief, there is no such data available from India.

A total of 200 police officers posted in the Jhalawar district, Rajasthan, India w included in the study. Five milliliter of blood was collected aseptically from each officer following all universal precautions. Prior to the study written informed consent was obtained. All samples were screened for hepatitis B surface antigen (HBsAg ERBA LISA hepatitis B), anti HIV antibodies (HIV third generation kit, ERBA LISA HIV 1+2), anti-hepatitis C virus (HCV) antibodies (ERBA LISA hepatitis C) and rapid plasma regain reactivity (Carbogen kit, Tulip diagnostics).

The seroprevalence of syphilis and HbsAg was 0.5% each that is, only one officer tested positive for hepatitis B and syphilis each. The seroprevalence of HIV and HCV was nil. In a similar study conducted in Tanzania, considerably higher seroprevalence rates were recorded for HIV and syphilis.<sup>[3]</sup> Another study conducted among the urban public safety workers in Detroit, USA revealed the HCV seroprevalence to be 0.6%.<sup>[4]</sup> A recent hospitalbased study conducted in Rajasthan, India has revealed the seroprevalence rates of HbsAg, HCV and HIV to be 0.87%, 0.28% and 0.35% among the general population, which is again higher than what is found in our study group.<sup>[5]</sup>

Despite the expected occupational stress and risk associated, it appears that our concept of presuming a higher incidence among this study group does not hold ground. The police personnel do not have an elevated seroprevalence of bloodborne viruses (BBVs) and syphilis when compared with the general population. There are very limited numbers of studies addressing this issue, and these studies have numerous limitations. Although the seroprevalence rates as found in our study is quite low, yet regular monitoring of information on high-risk behaviors and prevalence in this group is still strongly recommended. Public health policy must involve all sections of the community, including police personnel if we are to reduce transmission of HIV and other BBVs.

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# Original Article

# Rising trends of HCV infection over a period of 4 years among blood donors in central India: A retrospective study

Abstract

**Objective:** The aim of the study was to find out the sero-prevalence of Hepatitis C infection among blood donors. **Materials and Methods:** All collected blood bags were screened for anti-hepatitis C virus antibodies (HCV Ab; MicroELISA 3rd generation, J. Mitra) during the study period of 4 years and data were analyzed. **Results:** A total of 28621 blood donors were screened for transfusion transmissible infections (TTIs) in which 80 donors were positive for Hepatitis C infection, constituted 11% of total sero-reactive donors. In 2009, only 10 cases were sero-reactive while in 2012, 36 cases were sero-reactive for Hepatitis C infection. **Conclusions:** Hepatitis C infection among blood donors are in rising trends in this study area. Voluntary donors are safer than replacement donors as they have very low sero-prevalence. As these blood donors represent the highly selective community of a general population in most of the countries. So the actual sero-prevalence of hepatitis C infection may be more in the general population. Promoting HCV screening, voluntary blood donation, diagnosis and treatment among blood donors are very important measures to control the transmission of HCV infection, decrease sero-reactive cases and ensure safe blood collection.

Key words: Blood donors, hepatitis C infection, sero-prevalence

# INTRODUCTION

HCV is recognized as the primary cause of transfusion-associated non-A-non-B viral hepatitis worldwide,<sup>[1]</sup> and is endemic in West Africa.<sup>[2]</sup> Hepatitis C virus (HCV) cause serious mortality, morbidity and financial burden, thus are major global health problem.<sup>[3]</sup> The actual prevalence of HCV is difficult to assess because serological tests do not discriminate among acute, chronic, or resolved infection and the analyzed groups in most countries are not representative of the general population.<sup>[4]</sup>

However; most studies use blood donors as prevalence to report the frequency of HCV usually by anti-HCV antibodies and do not report follow-up HCV testing. Using blood donors as a prevalence source may underestimate the actual prevalence of the virus because donors are generally a highly selected population.<sup>[5]</sup> The aim of this study, was to find out the sero-reactive cases of Hepatitis C infection among blood donors during 4 years in central india.

### MATERIALS AND METHODS

The study was carried out in the Blood bank attached to a tertiary care hospital, Central India over a period of 4 years from January 2008 to December 2012. It was a retrospective study. All blood donations collected during this period were included. The donors were either voluntary or replacement donors. Replacement donors were either relatives or friends of patients.

All blood bags were screened for hepatitis B surface antigen (HBsAg; Hepalisa, J. Mitra), anti-human immunodeficiency virus antibodies (HIV Ab; HIV 3rd generation kit for detection of antibodies to HIV1 and HIV2, J. Mitra), anti-hepatitis C virus antibodies (HCV Ab; MicroELISA 3rd generation, J. Mitra) and Venereal Diseases Research Laboratory (VDRL) reactivity (Carbogen kit, Tulip Diagnostics). The data were analyzed with respect to sero-reactive cases.

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### RESULTS

A total of 28621 blood donors were screened for transfusion transmissible infections (TTIs) during the study period in which voluntary donors were 23133 while the replacement donors were 5488 as shown in [Table 1].

A total of 728 blood donors were found positive for transfusion transmitted infections (TTIs) during the study period in which Hepatits B was the most common infection followed by HIV and then, Hepatitis C infection. There is gradual rise in HCV infection per year as shown in [Table 2].

Rising trends of HCV infection among blood donors and seroprevalence of Hepatitis C infection was shown in [Table 3].

Using Chi-Square Value, significant association was found between blood donors and HCV infection in four years duration.

Distribution of HCV infection among replacement donors as well as voluntary donors was shown in [Table 4].

### DISCUSSION

With every unit of blood, there is 1% chance of transfusion associated problems including TTI.<sup>[6]</sup> The risk of TTI has declined dramatically

Table 1: Total blood collection and analysis ofblood donors				
Duration	Voluntary Donors in blood bank	Replacement Donors	Voluntary donors in Camp	Total Donors
2009	2974	1336	1102	5412
2010	3900	1617	1248	6765
2011	5420	1247	1468	8135
2012	5542	1288	1479	8309
Total	17836	5488	5297	28621



Table 3: Sero-reactivity of HCV infection yearwise					
Year	Sero-reactive cases of HCV infection	Total blood donors	Chi – Square Value	P-value	
2009	10	5412	10.15	0.0173	
2010	15	6765			
2011	19	8135			
2012	36	8309			
Total	80	28621			

Table 4: Sero-reactivity of HCV infection amongvoluntary and replacement donors yearwise				
Year	Sero-reactive voluntary donors	Sero-reactive replacement donors	Total sero- reactive case donors	
2009	3	7	10	
2010	5	10	15	
2011	6	13	19	
2012	13	23	36	
Total	27	53	80	

in high income nations over the past two decades, primarily because of extraordinary success in preventing HIV and other established transfusion transmitted viruses from entering the blood supply.<sup>[7]</sup>

Many studies including studies done by Rao and Annapurna *et al.*,<sup>[8]</sup> in Pune, Rose *et al.*,<sup>[9]</sup> in Vellor, Arora *et al.*,<sup>[6]</sup> in Southern Haryana, Singh *et al.*,<sup>[10]</sup> in Coastal Karnataka, Pahuja *et al.*,<sup>[11]</sup> in Delhi and Singh *et al.*,<sup>[12]</sup> showed that more than 90% were male donors as also in our study.

Among the studies done, Garg *et al.*,<sup>[13]</sup> have reported an HCV prevalence of 0.28% in blood donors of Western India. Similar studies by Sri Krishna *et al.*,<sup>[14]</sup> have noted a prevalence of 1.02%, Sood *et al.*, and Pahuja *et al.*, have reported a high prevalence of 2.2 and 2.23% in Delhi, respectively.<sup>[11]</sup> Added to this, HCV prevalence by Kaur *et al.*,<sup>[15]</sup> was 0.78%, Singh *et al.*, was 0.5% and Jain *et al.*, it was 1.57% in New Delhi voluntary blood donors.<sup>[11]</sup> Internationally, various studies<sup>[11]</sup> have reported an HCV prevalence range of 0.42-1.2%.

The studies<sup>[10-12]</sup> have showed high sero-positivity rate in replacement donors compared to voluntary donors, a similar findings was noted in our study. Chandra *et al.*,<sup>116]</sup> have found almost negligible infectivity rate in voluntary donors and also no voluntary donors was found to be positive for HIV by Arora *et al.*<sup>[6]</sup>

Among male blood donors in Karachi, Pakistan, the sero-prevalence of HCV was 1.8% with a trend of increasing proportion of positive donors from 1998-2002.<sup>[17]</sup> Then 26.6% among 188 blood donors and 22% among 163 donors were positive with both studies done in Cairo.<sup>[18,19]</sup> Rates were lower in Saudi Arabia (1.8%) and Yemen (2.1%).<sup>[20,21]</sup> In China, prevalence rates were generally low with rates around 1% among donors in Beijing and Wuhan.<sup>[22,23]</sup>

Mathai *et al.*,<sup>[24]</sup> (1994-96) Trivandrum, Kerala observed that most common infection was Hepatitis C infection (1.4%) followed by Hepatitis B infection (1.3%) and both HIV and syphilis each were seen in 0.2% of donors.

Shrestha *et al.*,<sup>[25]</sup> (2004-2007), Nepal, observed that Hepatitis C infection (0.64%) was most common infection followed by Hepatitis B(0.64%), syphilis (0.48%) and HIV 0.12% of total donors.

Chandra *et al.*,<sup>16</sup> (2001-2006) Lucknow, U.P. observed that Hepatitis B infection was most common (1.96%) followed by Hepatitis C infection (0.85%), HIV (0.23%) and syphilis was 0.01%.

Bhawani *et al.*,<sup>[26]</sup> (2004-2009) observed that Hepatitis B (1.41%) was most common infection followed by Hepatitis C infection (0.84%), HIV(0.39%) and syphilis was 0.08%.

Gao *et al.*,<sup>[27]</sup> showed that HCV infection rate in paid blood donors was significantly higher than in voluntary blood donors (15.53% vs 0.97%). It was observed that no significant difference was found in HCV infection rates between male and female blood donors and the prevalence of HCV infection was found to increase with age.

In a study, done by Pallavi *et al.*,<sup>[28]</sup> found that the incidence of Hepatitis C infection is more on replacement donors (0.23%) than volumtary donors (0.20%)

Many studies were done in different parts of India regarding seroprevalence of Hepatitis C infection and when compared with our study, it was found that the sero-prevalence was low but it was in rising trends as shown in [Table 5].

Numerous researches have shown that paid blood donors are more likely to be infected with HCV than either employer-organized donors or true voluntary donors<sup>[27]</sup>. Those paid donors who were attracted by high compensation and chose to donate blood in illegal blood stations, also risked a greater risk of cross-contamination. The prevalence rate among plasma donors was significantly higher than among whole blood donors (33.95% *vs* 7.90%), possibly due to cross-contamination of blood collection equipment by HCV positive plasma donors.<sup>[31]</sup> The elimination of paid plasma and whole blood donation could contribute to a reduction in HCV infection among blood donors.

In our study there were no paid donors.

#### CONCLUSION

Hepatitis C infection among blood donors are in rising trends in this study area. Voluntary donors are safer than replacement donors as they have very low sero-prevelence. As these blood donors represent the highly selective community of a general population in most of the countries, so the actual sero-prevalence of hepatitis C infection may be more in the general population. Promoting HCV screening, voluntary blood donation, diagnosis and treatment among blood donors are very important measures to control the transmission of HCV infection, decrease the sero-reactive cases and ensure safe blood collection.

# Table 5: Prevalence of HCV infection in defferentregions of Indian

Different regions of India	Prevalence of HCV(%)
Ludhiana <sup>[29]</sup>	1.09
Delhi <sup>[11]</sup>	0.66
Lucknow <sup>[16]</sup>	0.85
Southern Haryana <sup>[6]</sup>	1.0
West Bengal <sup>[30]</sup>	0.31
Bangalore <sup>[14]</sup>	1.02
Present Study	0.28

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# **ORIGINAL ARTICLE**

# Seroprevalence of Transfusion Transmissible Infections (TTIs) among blood donors in a tertiary care hospital, central India: A prospective study

Alok Kumar<sup>1,2</sup>, Shatish M. Sharma<sup>1</sup>, Narayan S. Ingole<sup>1</sup>, Nitin Gangane<sup>1</sup>

#### ABSTRACT

Background: Blood transfusion having some risks of transfusion transmissible infections (TTIs) in the recipients especially when blood is collected during window period. In Africa, about 10-15% of human immunodeficiency virus (HIV) transmission had been related to blood transfusions. Aims: The aim of this study is to present the prevalence of TTIs among the apparently healthy donors, both voluntary as well as replacement donors. Settings and Design: This was a prospective study, carried out in a blood bank attached to a tertiary care hospital, Central India. Materials and Methods: All blood bags collected from these blood donors during the study period were screened for TTIs like hepatitis B surface antigen (HBsAg; Hepalisa, J. Mitra), anti-HIV antibodies (HIV Ab; HIV 3rd generation kit for detection of antibodies to HIV1 and HIV2, J. Mitra), anti-hepatitis C virus antibodies (HCV Ab; MicroELISA 3rd generation, J. Mitra), and Venereal Diseases Research Laboratory (VDRL) reactivity (Carbogen kit, Tulip Diagnostics). Serum were separated from all blood bags and serological test was performed according to the instructions provided by the manufacturers of respective kit. All seroreactive blood bags were considered as positive for TTIs and the blood bags were discarded. Statistical Analysis: A total of 10,582 blood donors were selected for blood donation after clinical history and brief medical examination by medical officer. Blood bags collected from them were screened for TTIs. Among the total blood bags screened, 273 (2.57%) were found positive for transfusion transmissible infectious diseases. Results: Among TTIs, the most common infection was hepatitis B followed by HIV infection in our study. Prevalence of coinfection in our study was very low (0.01%). Voluntary donations have low seroreactivity (2.40%) for TTIs as compared to replacement donations (3.20%). Conclusions: Multiple infections have a very small but definite risk to the recipients, recieving blood and blood products. Hepatitis B was the most common infection in our study. The incidence of coinfection was very low in our study. Prevalence of TTIs was more among replacement donors as compared to the voluntary donors. So, it is possible to improve the safety of blood and blood product by the promotion of voluntary donation, selection of low-risk donors, and use of highly sensitive laboratory screening test.

**Key Words:** Blood donors, seroprevalence, transfusion transmissible infections (TTIs)

#### Introduction

Blood transfusion is one of the therapeutic interventions that is associated with some risks of transfusion transmissible infections (TTIs) in the recipients especially when blood were collected during window period. In Africa, about 10-15% of human immunodeficiency virus (HIV) transmission had been related to blood transfusions.<sup>[1]</sup> Despite stringent donor screening and testing procedures, the safe to safe blood free from TTIs remains an elusive goal. Although there are many studies on the prevalence of TTIs in blood donors,<sup>[2-5]</sup> data on the presence of

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coinfection is few.<sup>[6]</sup> The aim of this study is to present the prevalence of TTIs among the apparently healthy donors, both voluntary as well as replacement donors.

#### **Materials and Methods**

The study was carried out in the blood bank, attached to the tertiary care hospital, Central India over a period of 19 months from November 2009 to May 2011.

It was a prospective study. All blood donations collected during this period were included. The donors were either voluntary or replacement donors. Replacement donors were either relatives or friends of patients.

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All blood bags collected from these blood donors during the study period were screened for TTIs like HBsAg (Hepalisa, J. Mitra — J. Mitra & Co. Pvt. Ltd, New Delhi, India), anti-HIV antibodies (HIV Ab; HIV 3rd generation kit for detection of antibodies to HIV1 and HIV2, J. Mitra — J. Mitra & Co. Pvt. Ltd, New Delhi, India), anti-hepatitis C virus antibodies (HCV Ab; MicroELISA 3rd generation, J. Mitra — J. Mitra & Co. Pvt. Ltd, New Delhi, India), and Venereal Diseases Research Laboratory (VDRL) reactivity (Carbogen kit, Tulip Diagnostics-Tulip diagnostics (P) Ltd, Uttarakhand, India).

Serum was separated from all blood bags and serological test was performed according to the instructions provided by the manufacturers of respective kit. All seroreactive blood bags were considered as positive for TTIs and the blood bags were discarded.

#### **Statistical Analysis**

A total of 10,582 blood donors were selected for blood donation after clinical history and brief medical examination by medical officer. Blood bags collected from them were screened for TTIs. Further, within the seroreactive group, cases with a combination of two or more than two TTIs were labeled as coinfection.

#### **Results**

A total of 10,582 blood donors were screened for TTIs, 97.05% were male and 2.95% were female. Almost 78% were voluntary donors and 22% were replacement donors. Among voluntary donors, 96.24% were male and 3.76% were female donors as shown in Table 1.

Among a total of 10,582 blood donors screened, 273 (2.57%) were found positive for infectious diseases, in which hepatitis B infection (1.76%) was the commonest infection among blood donors followed by HIV infection (0.53%). Most of the infections were caused by single organism, except in one having mixed infection caused by hepatitis B and HIV and no donors were positive for malarial parasite as shown in Table 2.

A total of 8,232 voluntary donors was screened in which 197 (2.40%) were found positive for infectious diseases while 76 (3.20%) of replacement donors were found positive against a total of 2,350 replacement donors. Distribution of TTIs among voluntary as well as replacement donors is shown in Table 3.

#### **Discussion**

In our study, a total of 273 (2.57%) donors were seropositive for infectious diseases (TTIs) out of 10,582

Table 1: Status of donors as per sex and type					
Category of donors Male (%) Female (%) Total Donors (%)					
Voluntary donors	7922 (96.24)	310 (3.76)	8232 (77.79)		
Replacement donors	2347 (99.9)	03 (0.10)	2350 (22.21)		
Total	10269 (97.05)	313 (2.95)	10582 (100)		

Table 2: Seropositive infections among donors			
HIV	57 (0.53%)		
HBsAg	187 (1.76%)		
HCV	21 (0.20%)		
VDRL	07 (0.07%)		
HIV and HBsAg	01 (0.01%)		
Malarial parasite	0		
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Total positive cases/total blood donors 273 (2.57%)/10582 (100%) *HIV* = human immunodeficiency virus; *HBsAg* = hepatitis B surface antigen; *HCV* = anti-hepatitis C virus; *VDRL* = Venereal Diseases Research Laboratory

Table 3: Seropositive infections among voluntary

and replacement donors					
Infections	Seroreactive voluntary donors/total voluntary donors	Seroreactive replacement donors/total replacement donors	Total seroreactive donors/total blood donors		
HIV	41	16	57		
HBsAg	136	51	187		
HCV	15	06	21		
VDRL	04	03	07		
HIV and HBsAg	01	_	01		
Total	197/8232	76/2350	273/10582		

*HIV* = human immunodeficiency virus; *HBsAg* = hepatitis B surface antigen; *HCV* = anti-hepatitis C virus; *VDRL* = Venereal Diseases Research Laboratory

donors screened, hepatitis B virus infection 187 (1.76%) was the commonest infections among donors followed by HIV (0.53%) while hepatitis C accounts for 21 (0.20%) and syphilis in 07 (0.07%) of all donors screened. No donors had malarial infections. Most of the infections were caused by single organism, except one having mixed infection caused by hepatitis B and HIV.

In the study done by Chickwem *et al.*,<sup>[7]</sup> it was found that the most common infection was hepatitis B (14.84%) followed by HIV-1 (5.77%) while *Plasmodium falciparum* accounted for 4.12% and *Treponema pallidum* for 3.57%. No donors had HIV-2 or filarial infections. On the whole, a total of 94 (25.8%) blood donors were infected by one infectious agent or the other. Only nine (2.5%) had mixed infections.

In study done by Fasola *et al.*,<sup>[8]</sup> (2001-2006), Nigeria, it was observed that the most common infection was hepatitis B (13.2%) followed by HIV (7.6%), HCV (3.6%) and no donors had syphilis infection.

Shrestha *et al.*,<sup>[9]</sup> (2004-2007), Nepal, observed that hepatitis C infection (0.64%) was the most common

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infection followed by hepatitis B (0.64%), syphilis (0.48%), and HIV 0.12% of total donors.

Mathai *et al.*,<sup>[3]</sup> (1994-96), Trivandrum, Kerala observed that the most common infection was hepatitis C infection (1.4%) followed by hepatitis B infection (1.3%), and both HIV and syphilis each were seen in 0.2% of donors.

Garg *et al.*,<sup>[5]</sup> (1994-99), Jodhpur, Rajasthan observed that hepatitis B (3.4%) was the most common infection followed by HIV (0.44%), hepatitis C infection (0.28%), and syphilis was 0.22%.

Chandra *et al.*,<sup>[10]</sup> (2001-2006), Lucknow, U. P. observed that hepatitis B infection was most common (1.96%) followed by hepatitis C infection (0.85%), HIV (0.23%), and syphilis was 0.01%.

Bhawani *et al.*,<sup>[11]</sup> (2004-2009) observed that hepatitis B (1.41%) was the most common infection followed by hepatitis C infection (0.84%), HIV (0.39%), and syphilis was 0.08%.

Kapur and Mittal *et al.*,<sup>[12]</sup> found that in HIV-positive donors, HBsAg was positive in 12.2% while VDRL was reactive in 11.8%.

Jain *et al.*,<sup>[13]</sup> estimated the seroprevalence of hepatitis virus in patients infected with HIV and found that 9.9% of patients were HBsAg-positive, 6.3% were HCV-positive and about 1% had dual infection with HBV and HCV.

Mathai *et al.*,<sup>[3]</sup> found that of 31,942 donors screened over a 6-year period, mixed infections were seen in only 10 donors (0.03%).

Studies on the prevalence of hepatitis viruses in patients with HIV have shown the HIV and HBV/HCV coinfection rate to be 12-15%.<sup>[14-16]</sup> However, studies from India show that this varies with the geographical region with rates of 9-30% for HBV and 2-8% for HCV have been reported.<sup>[17-19]</sup>

On comparing with these studies, we observed that hepatitis B infection (1.76%) was the most common among blood donors in our study as also observed in other studies<sup>[5,8,10-12]</sup> followed by HIV infection (0.53%). No cases of malarial parasites were detected in our study. It was due to proper clinical assessment and history of the donor. Only one donor had coinfection with both hepatitis B and HIV out of 10,582 donors screened. Prevalence of coinfection in our study was very low (0.01%) as compared to other studies where prevalence of coinfection was high.<sup>[12-16]</sup> However, prevalence of

coinfection in our study was similar to study done by Mathai *et al.*,<sup>[3]</sup> (2002).

#### Conclusions

Multiple infections have a very small but definite risk to the recipients, receiving blood and blood products. Hepatitis B was the most common infection in our study. The incidence of coinfection was very low in our study. Prevalence of TTIs was more among replacement donors as compared to the voluntary donors. So, it is possible to improve the safety of blood and blood product by the promotion of voluntary laboratory screening test.

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# **Original Research Article**

# Incidence of Syphilis among pregnant women attending a tertiary care hospital in Navi Mumbai, India

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### ABSTRACT

Keywords Syphilis; Pregnancy; Incidence; RPR; Antenatal Care; Navi Mumbai. The incidence of syphilis in pregnant women attending a tertiary care hospital in Navi Mumbai was determined. A prospective study was conducted at MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai from January 2012 - December 2012 on all newly registered Antenatal Care (ANC) patients. Sera from these pregnant women were examined for Syphilis using the RPR test. Two thousand seven hundred and four (2704) pregnant women were included in this study. Women belonged to age group 20-45 years. The incidence of Syphilis was found out to be 0.36% (10 out of 2704 samples) and the maximum positive cases for Syphilis infection were in the age group of 36-40 years; 01out of 143 (0.69%). Although the incidence of Syphilis in this study was low, it cannot be ruled out that these women, if were untreated, could have resulted in serious sequeles of foetus/newborns. An early diagnosis of Syphilis in antenatal period facilitates proper patient management and initiation of therapy to prevent transmission of congenital infections and anomalies to newborns.

### Introduction

During check-up of pregnant women in antenatal period, apart from obstetric and foetal examination, a number of laboratory tests are done to detect microbial infections which can be transplacentally transmitted to growing foetus and cause congenital infections and congenital anomalies.

Syphilis is a sexually transmitted disease caused by *Treponema pallidum*, a spirochete. It forms a major public health problem in many parts of the world especially in developed countries (Nakashima et al., 1996). Globally, about 340 million new curable Sexually Transmitted Infections occur each year and out of these infections, syphilis accounts for about 12million cases, 2 million of them being pregnant women Romanowski, (Singh and 1999). However, these figures represent only a minor part of the problem since a large number of cases go unreported and are

also likely to be either untreated or improperly treated. Prevalence rates are far higher in developing countries where treatment is less accessible. The prevalence of syphilis in pregnant women in some developing countries ranges from 1% to 20% (Brunham and Embree, 1992). In the developing world, the Sexually Transmitted Disease epidemic is characterised by high rate of complications, alarming rate of antibacterial resistance and interaction with HIV infection (Over and Piot, 1991; Buve et al., 1993).

Syphilis is a major cause of reproductive morbidity, mortality and poor pregnancy outcomes in developing countries. Syphilis in pregnant women can result in adverse pregnancy outcomes in about 80% of cases, which includes stillbirth and spontaneous abortion (40%), perinatal and serious death (20%).neonatal infections and low-birthweight babies (20%) (WHO, 2005). Its association with increased risk for HIV infection, Syphilis has also acquired a new strengthening potential for morbidity and mortality (Olokoba et al., 2008).

Because of the serious complicated outcomes of syphilis in pregnancy, WHO has recommended universal antenatal screening. WHO further recommends screening for syphilis at the first antenatal visit, as early as possible in pregnancy, repeating in the third trimester if resources permit, to detect infection acquired during pregnancy (WHO, 2005).

Venereal disease research laboratory test (VDRL) and Rapid plasma reagin (RPR) are the non-treponemal tests for Syphilis detection and are helpful indicators of infection for screening purposes. These are cheaper and easy to perform than treponemal tests. For the effective management of pregnant females and to reduce the incidence of perinatal transmission of Syphilis, a definitive and early diagnosis is essential. Paucity of such reports from Navi Mumbai necessitated this study.

# Materials and Methods

# Period of study

January 2012 to December 2012.

# Place of study

Samples were obtained from MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai. Tests were carried out at MGM Central Laboratory, MGM Hospital, Kamothe, Navi Mumbai and Microbiology Laboratory, MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai.

# Specimens

Serum separated from blood samples obtained from pregnant women.

### Sample size

All cases of pregnancy that were registered for antenatal care (ANC) at MGM Maternity and Children hospital, Kalamboli, Navi Mumbai, India from January 2012 to December 2012.

# Type of study

Prospective study

### **Study Design**

Only those samples were considered for the study which fulfilled the inclusion criteria-

### **Inclusion criteria**

All pregnant women newly registered for Antenatal Screening (ANC) at MGM Hospital Kalamboli from January 2012 to December 2012 were included in this study.

### **Exclusion criteria**

ANC registered women coming for above tests for second instance were excluded.

# For Syphilis testing

Rapid Plasma Reagin (RPR) card test / Carbogen antigen for syphilis testing Tulip Diagnostics Pvt. Ltd. Goa, India). (Lot no.: 674208; Manufacturing date: Jan, 2012; Date of expiry: May, 2013). Mechanical rotor at 180 r.p.m. High intensity light source. Centrifuge machine for separating serum from blood sample. Precision pipette / micropipette.

### **Collection of specimens**

Blood collection was performed using universal safety precaution. 2 ml blood was collected from the pregnant female using standard venipuncture technique. Then blood was transferred in a test tube. The tube with the sample was labeled properly with the name, age and identification number. Blood was allowed to clot naturally and following this serum was separated. If serum specimens were not to be tested immediately, they were refrigerated at 2 - 8°C. For storage for more than 3 days, specimens were frozen at -20°C or below. Repeated freezing and thawing of the specimen were avoided.

## Test for syphilis

**Rapid Plasma Reagin (RPR) Card Test** (Tulip Diagnostics Pvt. Ltd. Goa, India). Lot no: 674208; Manufacturing date: Jan, 2012; Date of expiry: May, 2013.

## **Qualitative Method**

One drop (50  $\mu$ l) of the test specimen, positive and negative controls were pipetted onto separate reaction circles of the disposable slide (provided with kit) using a sample-dispensing pipette. Then one drop of well-mixed CARBOGEN<sup>®</sup> reagent was pipetted next to the test specimen, positive control and negative control by using the reagent dropper provided with the kit.

Care was taken that the dropper tip did not touch the liquid on the slide. By using a mixing stick, the test specimen and the CARBOGEN<sup>®</sup> reagent were mixed thoroughly spreading uniformly over the entire reaction circle. Immediately the slide was placed on a mechanical rotor at 180 r.p.m with timer set for 8 minutes. The slide was observed for any flocculation macroscopically at 8 minutes. If any flocculation was seen then the specimen was further tested using quantitative method.

# **Quantitative Method**

Using isotonic saline serial dilutions of the test sample positive in the qualitative method were prepared (1:2, 1:4, 1:8, 1:16,1:32, 1:64, 1:128 and so on). The qualitative test procedure using each dilution was prepared as test specimen. The titre was interpreted as the reciprocal of the highest dilution, which showed a positive test result.

Large and Medium black floccules against white background : Reactive. Small black floccules against white background: Weakly Reactive. No floccules, even grey background : Non-reactive.

# **Quantitative Method**

The titre of anti-lipoidal antibodies is the highest dilution of the test sample giving a positive test result.

# **Result and Discussion**

Two thousand seven hundred four (2704) new ANC cases were registered in MGM Maternity and Children Hospital, Kalamboli, Navi Mumbai and all these were subjected for RPR testing. The incidence of Syphilis in this study was 10(0.36%) (Figure 1). The recorded age range was 20-45 years old. Table 1 shows age distribution and Syphilis positive by RPR method.

Syphilis sero-reactivity among pregnant women is highly variable from as low as 0.02% to as high as 12.1% among the world's populations (Lumbiganon *et al.*, 2002).

In the present study the incidence of Syphilis among studied population was only 10 out of 2704 which accounted for 0.36%. According to WHO, the maternal syphilis in India has remained at around 1.5% from 2003 to 2007 (Rattan *et al.*, 1987). Similar findings have been previously reported in India in some research studies like in a research study by Mathai *et al.*, (0.98%) and Sethi*et al.*, (0.84%) in 2001 and 2005 respectively (Mathai *et al.*, 2001; Sethi *et al.*, 2005). According to a report published by WHO (1996), Syphilis incidence has increased from 5-15 per 100,000 observed in 1990 to as high as 120-170 per 100,000 of population in 1996 (Cates *et al.*, 1996).

In a study conducted in Ethiopia showed seropositivity of Syphilis was 2.9% (12 out of 410) in pregnant women (Kebede *et al.*, 2000). In Nigeria two independent studies were conducted in 2009 which showed that the seropositivity of Syphilis in pregnant women was 0.4% (01 out of 231 pregnant women) and 1.5% (157 out of 10680) in year when screened for Syphilis infection by RPR method (Olokoba *et al.*, 2009; Ibadin *et al.*, 2009).

Studies from Saudi Arabia in year 2000 and 2007 have reported a rate of 0.7% and 0.02% of syphilis among prenatal women respectively (Zimmo *et al.*, 2000; Sharifa, 2008). The low incidence rate of syphilis among pregnant women in our study could be either due to greater awareness, improved access to healthcare, effective control programmes and efficacious treatment.

An early diagnosis of Syphilis in antenatal period facilitates proper patient management and initiation of therapy to congenital prevent transmission of infections and anomalies to newborns. Even though the incidence rate of Syphilis in pregnant women recorded in this region is low from this study, it is still advisable for pregnant women to be screened for syphilis because the disease is treatable, and it will help eliminate the adverse effects of untreated Syphilis.

Age Group	Total Cases Tested	Syphilis Positive	Syphilis Negative
20-25	1127	05	1122
26-30	923	04	919
31-35	394	00	394
35-40	143	01	142
41-45	117	00	117

**Table.1** Age distribution and Syphilis positive by RPR method.

# Figure.1 Incidence of Syphilis



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# Patterns of infective sero positivity among blood donors in a rural Medical College Regional Blood Transfusion centre: A retrospective study

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#### ABSTRACT

**Background:** Transfusion-transmitted infections (TTI) is still burden that continue to be a threat to safe transfusion practices of blood & components and one of the major problem in delayed transfusion hazards. In the present study prevalence and patterns of co-infections among voluntary and replacement donors were analyzed.

**Methods:** This is descriptive study. Blood collected over a 6-year period were studied for the type of donation (voluntary or replacement), number of seroreactive cases and the number, type and distribution of co-infections among different type of donors.

**Results:** Out of 127995 units of collected blood, 106755 (83.40%) were voluntary and 21240(16.60%) replacement donors of them 1463 were seroreactive. Out of 1463 seroreactive cases (1.14%) 128(0.10%), 137(0.11%),1025(0.8%) & 173(0.13%) were HIV, HCV, HBsAg (Hepatitis B surface antigen) & VDRL (Venereal Diseases Research Laboratory) respectively. 30 (0.02%) cases of seropositive samples showed more than one seroreactive reactions which were collected 14(0.06%) from replacement donors and 16(0.01%) samples from voluntary donors. Only 2 samples (0.001%) of repeat donors show seropositivity.

**Conclusion:** Possibilities of transfusion transmitted infections were more with replacement blood donors in comparison to voluntary blood donors. Repeat donors were safer than first time donors. Though the incidence was less, chances of multiple infections were still problems to the recipients. Proper history taking, screening and encouragement of blood donation would definitely reduce the chances of transfusion transmitted infection.

**Keywords:** Transfusion-transmitted infections; blood donors; seropositivity

life saving resource; still it can be the one of the source of infective diseases if there remain any lacunae in screening of blood during processing. Several factors play a role to detect TTI .In spite of meticulous testing one can not detect the infections in "Window Phase". If we look back the

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#### **Background:**

In spite of history taking & screening Transfusion Transmitted Infections (TTI) is still burden for safe transfusion and responsible for hazards of Blood Transfusion. Blood is a incidence of TTI would be more .In spite of technological advancements, the problems of 'window period', false-negative results, prevalence of asymptomatic carriers, genetic variability in viral strains and technical errors to be considered.<sup>1</sup>

Hepatitis B is one of the common TTI. In most of the blood banks the diagnosis of HBV infection is based on the presence of Hepatitis B Surface Antigen in the Blood stream which does not confirm the absence of HBV infection. The occult HBV infection can only be diagnosed by HBc and HBV DNA. Many workers had shown a significant numbers of HBsAg negative blood donors were anti HBc positive and exposed to HBV infection. These donors are potential for transmitting HBV contaminated blood.<sup>2</sup>

Hepatitis C virus (HCV) is another important cause of post transfusion non-A non B hepatitis and 200 million individuals had chronic HCV infection. The global seroprevalance of HCV among blood donors varies from 0.4-19.2%.<sup>3</sup>

Some literatures showed 0.81% HIV Positivity<sup>4</sup> and presence of co- infection TTI among blood donors. Currently safe blood transfusion is ensured by careful donor's selection and mandatory screening for TTI. In spite of all precautions, transmission of HIV via blood and components transfusion is still present. This is mostly due to collection of blood during window phase .<sup>5</sup>

There are many studies on the prevalence of TTI in blood donors.<sup>6-8</sup> Less number of data showed presence of coinfection with more than one TTI.<sup>6-9</sup> In the present study we analyzed the patterns of infections among the blood donors and the recipients including multireceipients (thalassaemia), in a rural medical college and hospital blood bank in our region covering about average distance of 30 km around the centre over a period of 6 years. TTI continue to be problems in many part of the world as well India and the multitransfused patients of Thalassaemia major are particularly at increased risk of TTI.<sup>10</sup> The aim of this study was to find out the incidence of seropositivity of TTI among the blood donors (voluntary + replacement) and increase the number of donors for safe blood.

#### Methods:

The present study was conducted at the Department of Pathology, Burdwan Medical College and Hospital, Burdwan over a period of 6 years (2006-2011) taking all blood collected during this period. The donors were either voluntary (Camp) or replacement donors (relatives or friends of patients in the blood bank). All samples were screened for hepatitis B surface antigen (HBsAg; Hepalisa, J.Mitra ELISA of SPAN), anti-human immunodeficiency virus antibodies (HIV Ab;HIV 3rd generation kit for detection of antibodies to HIV1 and HIV2, J. Mitra & S.D. lab), anti-hepatitis C virus antibodies (HCV Ab; Micro ELISA 3rd generation, J. Mitra & SD Lab ) and Venereal Diseases Research Laboratory (VDRL) reactivity (Carbogen kit, Tulip Diagnostics as well as RPR Span ). The multi transfused patients of Thalassaemia major were tested for TTI at an interval of 6 months. The total number of seroreactive cases and their distribution were noted. Cross checking was done by calling the donors through post or over telephone. The donors with more than one seroreactivity were noted and were identified as co- infection. All statistical analysis were done using SPSS version 17.

#### **Results:**

Out of total 127995 units of collected blood 106755 (83.40%) were from voluntary and 21240 (16.60%) from replacement donors .Total collection showed 75% were rural donor and 25% urban donors. Of the Voluntary donors 91.70% were male 8.30% were female (Table-I). Among replacement donors 97.89% were male and 2.11% were female. This study showed increased trend of Voluntary blood donation (13764 in 2006 to 21631 in 2011) and increased numbers of Voluntary blood donation camp [241(2006) to 353 (2011)] (Table -1 and Chart -I ).

# Table IA Year wise collection of Blood(Voluntary &Replacement) for the period 2006-2011

	2006	2007	2008	2009	2010	2011	Total
Total collection	17283	17713	19628	21177	24165	28029	127995
Voluntary collection	13764	14921	18375	18689	19375	21631	106755 (83.40%)
Replacement collection	3519	2792	1253	2488	4790	6398	21240 (16.6%)

# Table IB Year wise Voluntary collection of bloodthrough camp according to sex for the period 2006-2011

	2006	2007	2008	2009	2010	2011	Total
Voluntary male	12364	13360	17791	16793	17340	19824	97472 (91.30%)
Voluntary female	1400	1561	584	1896	2035	1807	9283 (8.70%)
No. of Camp	241	268	268	283	324	353	

Table IC Year wise replacement collection of bloodaccording to sex for 2006-2011.

	2006	2007	2008	2009	2010	2011	Total
Replacement male	3477	2742	1200	2424	4678	6271	20792 (97.89%)
Replacement female	42	50	53	64	112	127	448 (2.11%)
Camp	241	268	268	283	324	353	



# Chart-I : Showing increased trend of voluntary blood donation.

Out of total 127995 blood donors (Voluntary +Replacement) 1463(1.14%) were seroreactive and incidence of HIV, HCV, HBsAg, VDRL reactivity were 128(0.10%), 137(0.11%), 1025(0.80%), 173(013%) respectively, which indicates highest incidence of HbsAg infection (72.3%, 8 times more than that of HIV reactivity). The seropositivity of the voluntary & replacement donors were 1166 (1.09%) & 297 (1.39%) respectively (Table -2) which indicates higher seropositivity among replacement donors. Out of 1463 sero positive donors 30 (2.05%) had co-infection (more than one infection) and showed 16(1.37%) were voluntary donors & 14 were replacement donors (4.47%). VDRL & HIV confections were observed among 6(0.41%)donors & VDRL, HIV & HBsAg co infections in 1 donor (0.06%). HBsAg &HIV, HIV with HCV, HIV with HCV & HbsAg, HbsAg &VDRL, HCV with VDRL, HbsAg and HCV confections were 7(0.47%), 2 donors(0.17%), 3 donors (0.21%),6(0.41%), 2(0.13%) and 3 donors(0.21%) respectively.

Table- 2A Year wise HIV&HCVpositivity of Voluntarydonors for the period 2006-2011

	2006	2007	2008	2009	2010	2011	Total	%
Voluntary collection	13764	14921	18375	18689	19375	21631	106755	83.40
Seropositivity HIV	13	16	17	18	11	10	85	0.08
Seropositivity HCV	17	20	22	19	16	26	120	0.11

# Table2B Year wise HBsAg & VDRLpositivity ofVoluntary donors for the period 2006-2011

	2006	2007	2008	2009	2010	2011	Total	%
Voluntary collection	13764	14921	18375	18689	19375	21631	106755	83.40
Seropositivity HBsAg	106	109	130	121	173	162	801	0.75
Seropositivity VDRL	18	28	22	25	28	39	160	0.15

# Table 2C Year wise HIV&HCVpositivity ofReplacement donors for the period 2006-2011

	2006	2007	2008	2009	2010	2011	Total	%
Replacement donors	3519	2792	1253	2488	4790	6398	21240	16.6
Seropositivity HIV	8	7	5	6	8	9	43	0.2
Seropositivity HCV	3	3	2	3	4	5	20	0.09

# Table 2D Year wise HBsAg & VDRLpositivity ofReplacement donors for the period 2006-2011

	2006	2007	2008	2009	2010	2011	Total	%
Replacement donors	3519	2792	1253	2488	4790	6398	21240	16.6
Seropositivity HBsAg	38	30	15	23	50	65	221	1.04
Seropositivity VDRL	2	2	1	4	3	1	13	0.06

# Table 2E Year wise total Seropositivity of Voluntary &Replacement donors

	2006	2007	2008	2009	2010	2011	Total	%
Total Seropositivity of Voluntary collection	154	173	191	183	228	237	1166	1.09
Total Seropositivity ofReplacement donors	51	42	23	36	65	80	297	1.39

Out of total donors only 13 female (0.01%) were seroreactive and none had co infection.

The age incidence of seropositive donors ranged from 19 to 50 years where as about 80% donors with co infection were 26 to 33 years.

Out of total 127995 collected blood 1645(1.28%) blood were discarded, of which 1463(88.94%) were due to seropositivity and 182(11.06%) were due to other causes include hemolysis, less collection, damage to the bags during transportation and date expiry etc.126350 units of blood were issued for transfusion. 9 multitransfused recipients were found seropositive and 7 of them were Thalssaemic. All of them were seronegaive before transfusion.

The incidence of co infection reduced dramatically from 2009. No donors were detected with co- infection in 2010& 2011.

### Discussion:

In spite of screening, TTIs continue to be burden to safe blood transfusion practices. With every unit of blood, there is 1% chance of a transfusion related problem including TTIs.<sup>8</sup> Professional donors and donors with high risk behavior such as drug addict, homosexual, commercial sex workers carry more risk of TTI positivity.<sup>11</sup>

Transfusion of blood & blood components are life saving measures of innumerable of patients worldwide. On the contrary blood and blood components are one the important route for transmission of TTI. In developing country absolute safe transfusion is far away which need awareness, education and improved technology for attaining zero level of Transfusion acquired infection.

In our study there were no professional donors and the blood was collected from 106755 (83.40%) voluntary donors which is nearer to the target of NACP III (90%) & 21240

#### (16.60%) from replacement donors.

The present study showed the seropositivity of replacement donors higher than voluntary donors (p=0.02). The replacement donors were usually friends or relatives of the recipients. Sometimes replacement donors due to social factors may conceal their high risk activities to their relatives. In the present study it was observed the seroreactivity was higher in replacement donors (1.39%) than voluntary donors (1.09%) The concealment of Medical history and life style are the important causes of seropositivity among the voluntary and replacement donors. Higher seropositivity was observed in replacement donors in this study.

Difference in infection rates between voluntary and replacement donors have been observed in many earlier studies (Table-3).<sup>14-16</sup> Family donors cannot be included amongst voluntary-non-remunerated blood donors as they have a higher rate of TTIs.<sup>17</sup>

# Table-3A Prevalence of transfusion - transmissibleinfection in different studies from India

Study duration	Singh et al 1997-99	Garg et al 1994-98	Sharma et al 1997-2002	Gangadeep et al 2001-2005	Presentstudy 2006-2011
HIV	Voluntary-	Voluntary-	Voluntary-	Voluntary-	Voluntary-
	0.8	0.4	0.45	0.15	0.08
HIV	Replacement-	Replacement-	Replacement-	Replacement-	Replacement-
	0.8	0.2	0.32	0.44	0.2
HBsAa	Voluntary-	Voluntary-	Voluntary-	Voluntary-	Voluntary-
	1.9	3.5	1.26	0.65	0.75
nbsAg	Replacement-	Replacement-	Replacement-	Replacement-	Replacement-
	1.2	2.6	0.91	1.07	1.04

# Table 3B Prevalence of transfusion - transmissible infection in different studies from India

Study duration	Singh et al Garg et al on 1997-99 1994-98		Sharma et al 1997-2002	Gangadeep et al 2001-2005	Present study 2006-2011
HCV	Voluntary- 3.0	Voluntary- 0.23	Voluntary- 0.52	Voluntary- 0.3	Voluntary- 0.11
	Replacement- 1.3	Replacement- 0.13	Replacement- 0.23	Replacement- 0.5	Replacement- 0.09
VDRI	Voluntary	Voluntary	Voluntary- 0.52	Voluntary- 0.19	Voluntary- 0.15
VURL	Replacement-	Replacement	Replacement- 0.26	Replacement- 0.48	Replacement- 0.06

Study, Duration	HIV+ HBsAg	HIV+ HCV	HIV+ VDRL	HIV+ HBsAg+ HCV	HBsAg+ VDRL	HCV+ VDRL	HBsAg+ HCV	HIV+ HBsAg+ VDRL
Gagandeep Kaur etall 2001-2005	22.7%	4.5%	18.25%	-	22.7%	18.25%	9.1%	4.5%
Our study 2006-2011	23.33%	6.7%	20%	10%	20%	6.7%	10%	3.33%

Table 3C Prevalence of transfusion - transmissibleinfection in different studies from India

In the present study 1463 donors were sero reactive showing a gradual tendency of declining seroreactivity (Chart-II). The co infection is statistically higher in replacement donors (p < 0.001) though the rate of co infection is less in our country. Gangadeep Kaur et al (2010) showed co infection is higher in replacement donors than voluntary donors (P < 0.005) and similar to other studies (Table - 4).

 Table -4 Comparison of prevalence of co- infection with other study

Study, Duration	HIV+ HBsAg	HIV+ HCV	HIV+ VDRL	HIV+ HBsAg+ HCV	HBsAg+ VDRL	HCV+ VDRL	HBsAg+ HCV	HIV+ HBsAg+ VDRL
Gagandeep Kaur etall 2001-2005	22.7%	4.5%	18.25%	-	22.7%	18.25%	9.1%	4.5%
Our study 2006-2011	23.33%	6.7%	20%	10%	20%	6.7%	10%	3.33%

Our study showed 66.66% co infection with HBsAg and 63.33% with HIV and 50% had VDRL co infection. Most common co infection was HIV& HBsAg (23.33%) followed by HIV& VDRL (20%) and HBsAg& VDRL (20%) and 93.33% donors had co infection either with HBsAg or HIV.

Post transfusion infections occurred in 9 recipients (0.007%) and mostly were Thalssaemic (77.77%) and all were multitransfused. The TTI from screened blood depends on various factors like the safety of donor population, sensitivity of the screening tests used & numbers of test performed window-period donations, and other reasons such as mutant strains.<sup>20</sup>

Roopam Jain et al in their study showed that out of 96 multitransfused Thalssaemic patients, 24 (25%) were reactive for anti-HCV. The seroreactivity of males were significantly higher than females (p < 0.0001) No female donor showed co infection.

India has one of the largest pools of hepatitis B-infected patients<sup>12,13</sup> and of all seroreactive donors HBV is more common (0.8%).

Chronic hepatitis B virus (HBV) infection remains a major public health problem worldwide with more than 300 million chronic carriers.<sup>14</sup> The course of HBV infection depends on several factors that can influence the immune system, including age at infection and host genetic factors, and genetic variability of the virus influencing the expression of the viral antigens.<sup>18</sup> Proper screening of HBV can be done to prevent transfusion-transmitted hepatitis B virus (HBV) by using progressively more sensitive HBsAg assays.

Nucleic acid amplification testing (NAT) for HCV and HIV infection had been successfully introduced to screen donors in many developed countries but the cost- effective ness to be considered in our country.<sup>19</sup>

HIV reactor among blood donors in the present study was 0.10% and had co infection 63.33%. According to the action plan of NACO all the HIV reactive blood donors should be notified of their status. In the developing countries like India confirmatory tests using Nucleic acid amplification technique (NAT) on HIV seroreactive blood is not feasible.

In India seroprevalance of HCV varies 0.12-4 % <sup>21</sup> which varies geographically.

Based on the results we feel that to reduce the risk of these infections blood should be accepted from voluntary donors & repeat voluntary donor. Donor selection and screening procedures must be strictly followed for the blood safety. Voluntary blood donation has to be made a part of healthy lifestyle, proper health education to be given to public about the benefits of voluntary blood donation & proper assurance to be given to all donors regarding the life style.

#### **Conclusion:**

To wipe of scarcity of blood and ensure availability of safe quality blood & component round the clock and throughout the year the transfusion service must necessarily be supported by voluntary blood donors.

Consequently, the recruitment of voluntary donors becomes one the most important aspects of blood transfusion services. Thus, healthy, responsive and motivated voluntary blood donors are the back-bone of the transfusion service.

Blood is a life saving agent but blood transfusion can be responsible of life threatening infections to the recipient if pre transfusion screening tests are not done properly.

Presently the safety of blood for transfusion is maintained by careful selection of voluntary donors and performing the mandatory screening for transfusion transmissible infections (TTI) as meticulously as possible.

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# Seroprevalence of HIV Infection among Leprosy Patients in Agra, India: Trends and Perspective<sup>1</sup>

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#### ABSTRACT

This study compares the results of HIV seroprevalence, which was carried out in two phases, i.e., 1989 to 1993 and 1999 to 2004. Although the number of leprosy patients screened for HIV infection in the second phase is less (2125) as compared to those screened during the first phase (4025), a rise in HIV infection from 0.12% to 0.37% is certainly disturbing since this area appears to be endemic for both the infections. During the study period, the Out Patient department attendance of a few types of leprosy patients like borderline and borderline lepromatous have risen, whereas others like borderline tuberculoid and polar tuberculoid have declined in the second phase as compared to that of the first phase. The trend over a decade suggests that HIV infection is low among the leprosy patients when compared with other risk groups. Follow-up of these patients at an interval of six months, revealed that none of them downgraded into a severe form of leprosy nor developed ARC or AIDS. In this study, it appears that neither infection precipitated the other. The occurrence of downgradation as well as reversal reactions and neuritis (both chronic and acute) was not observed among the leprosy patients. None of them developed erythema nodosum leprosum reactions. Similarly, the HIV-positive leprosy cases did not develop either AIDS related complex (ARC) or full blown case of AIDS.

#### RESUME

Cette étude compare les résultats de séroprévalence du VIH, obtenus en 2 phases distinctes : de 1989 à 1993 et de 1999 à 2004. Bien que le nombre de patients testés pour l'infection par le VIH soit moindre dans la seconde phase (2125) que dans la première (4025), une augmentation de prévalence de 0.12% à 0.37% est préoccupante puisque la région étudiée est endémique pour les 2 infections. Pendant la durée de cette étude, si la seconde phase est comparée à la première, la présentation de patients au service de Consultations Externes a augmenté pour quelques types de patients lépreux comme les patients borderline et borderline lépromateux et diminué pour les patients borderline tuberculoïdes et tubercu-

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loïdes polaires. La tendance dégagée sur une décennie suggère que l'infection par le VIH est faible chez les patients lépreux, comparés à d'autres groupes à risque. Le suivi tous les 6 mois de ces patients indique qu'aucun d'entre eux n'a rétrogradé en une forme sévère de la lèpre ou n'a développé le complexe associé au SIDA (ARC) ou le SIDA. Dans cette étude, il apparaît qu'aucune de ces infections ne précipite l'autre. Il ne fut pas observé de déplacement vers le bas le long du spectre immuno-pathologique ou de réactions inverses ou de névrites (à la fois chroniques ou aiguës) parmi les patients hanséniens. Aucun n'a développé de réaction de type érythème noueux lépreux. Concomitamment, les cas de lèpre aussi positifs au VIH n'ont développé ni de syndrome ARC ni de SIDA terminal.

#### RESUMEN

Este estudio compara los resultados de una encuesta sobre la prevalencia del VIH en pacientes con lepra, realizada en dos fases, la primera de 1989 a 1993 y la segunda de 1999 a 2004. Aunque el número de pacientes investigados para VIH fue mayor en la primera fase (4025) que en la segunda (2125), se notó un incremento en la infección por VIH de 0.12% a 0.37%. Esto es preocupante porque sugiere que esta área es endémica para las dos enfermedades. En la segunda fase del estudio, se observó un incremento en el número de pacientes BL/LL que acudieron al Instituto y una disminución en el número de los pacientes BT/TT. Los resultados globales indican que la infección por VIH es baja entre los pacientes con lepra en comparación con la infección en otros grupos de riesgo. El examen de estos pacientes a los 6 meses de seguimiento reveló que ninguno de ellos "se degradó" a una forma más severa de la lepra, ni desarrolló los signos del complejo asociado al SIDA, ni la enfermedad en si. Además, ninguna de las enfermedades precipitó a la otra. Ninguno de los pacientes desarrolló reacciones reversas (neuritis agudas y crónicas), ni eritema nodos leproso (ENL).

India has the largest number of known cases of leprosy and happens to incidentally be endemic for HIV as well. Some of the earlier studies done in North and North-Eastern India did not find any association of HIV infection with leprosy patients (<sup>24</sup>). A few studies from South Indian states showed a higher prevalence of HIV infection among leprosy patients, but these studies alone do not provide any indication of its association with leprosy (<sup>12</sup>). Leprosy caused by *Mycobacterium leprae* has an unusually long incubation period, and infection with HIV leads to a profound drop in CD4+ T-lymphocyte count and function and compromises the cell-mediated immune response, as well (19, 25). Earlier studies carried out in this center suggested that 1 per thousand (5/4025:0.124%) of the leprosy patients harbored HIV infection. Follow-up of these patients at an interval of six months, revealed that none of them downgraded into a severe form of leprosy nor developed ARC or AIDS (<sup>10</sup>). Although this study indicated that leprosy is not a risk factor for developing HIV-1 infection, the HIV surveillance studies on this population was continued with a view to assess the risk and find out the trend in an area where both

the infections are prevalent. This study compares the results of HIV seroprevalence, which was carried out in two phases; first, from April, 1989 to March, 1993 when HIV infection was being detected in India in different risk group populations to assess the risk among leprosy patients, and then from September, 1999 to March, 2004. This is the first report of a decade of HIV screening of leprosy patients in this region of the country and the longest follow-up of HIVleprosy co-infected cases.

One of the commonly observed complaints among leprosy patients was pain in the joints. Many studies have proven that microbial agents might trigger the autoimmune phenomenon and induce rheumatoid arthritis (1,5,8). In order to find out if arthritis is present in the HIV-leprosy co-infected patients, the sera from these cases were tested for Rheumatoid arthritis (RA) factor. Many risk behaviors as well as the routes of transmission for HIV, Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infection are identical to those for other sexually transmitted diseases (STDs) (3). For this reason, the leprosy sera samples were tested for HBsAg and VDRL simultaneously with HIV.

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#### MATERIALS AND METHODS

Leprosy patients, across the spectrum, i.e., tuberculoid (TT), borderline-tuberculoid (BT), mid-borderline (BB), borderlinelepromatous (BL), lepromatous (LL) and neuritic (N) types, classified, according to Ridley-Jopling criteria (<sup>23</sup>), attending the Unit-I of the Outpatient's Department (OPD) of the Central JALMA Institute for Leprosy and other Mycobacterial Diseases (CJILOMD) were included in the study. The leprosy cases in the study were neither newly admitted nor untreated patients, although a few were newly detected cases. For bacteriological determination, the six skin sites used were the two ear lobes and four representative active skin sites, i.e., hand (right arm and left arm), elbow (right and left), back, forehead, and the site of the lesion. In our OPD, four skin sites are routinely used for determination of the bacteriological index (B.I.). The inclusion criteria were: adult leprosy patients between the age group of 16 to 48 yrs. Children and old patients were excluded from the study as it was assumed they were not likely to be sexually active. In order to ensure that the patients were not screened over and over again, their OPD cards were marked, "HIV-Screened." This helped in excluding the repeat testing of the patients. Blood was collected asceptically from leprosy patients by ante-cubital venipuncture after obtaining pre-informed consent. The sera samples collected after centrifugation at 2500 g were stored at  $-20^{\circ}$ C until the assays were performed. ELISA was done using Genedia HIV-1/2 EIA kit (Greencross, Korea). Those found positive were confirmed by rapid (HIV capillus latex aggregation assay, Trinity Biotech PLC, Ireland) and Western blot assays (WesternBlot, BIO-RAD, NEWLAVBLOT), Nippon Bio-Rad Laboratories, Japan. After post-test counselling, a report was handed over to those found HIV-positive and patient was referred to clinicians for further care and management. To find out any other co-infections, the samples were further tested by HBsAg kit, (Immuno-chromatography test ERBA Hepline, Transasia Bio-Medicals Ltd., Mumbai, India) and VDRL and Rheumatoid Arthritis kits (Carbogen and Rhelax, RF of Tulip Diagnostics (P) Ltd., Bambolim, Goa, India).

#### RESULTS

The prevalence of HIV-1 infection in leprosy patients was observed in two phases. In phase one, 4025 patients [30 indeterminate (I), 141 polar tuberculoid (TT), 1888 boderline tuberculoid (BT), 409 borderline (BB), 600 borderline lepromatous (BL), 751 polar lepromatous (LL), 200 N] were screened between 1989 and 1993, out of which only 8 were ELISA positive and 5 were Western Blot reactive. Subsequently, in the second phase from 1999 to 2004, 2125 patients (21 I, 19 TT, 646 BT, 332 BB, 610 BL, 324 LL, 173 N) were screened, out of which 8 were ELISA positive and 5 were Western Blot reactive (Table 1). The variation in the results of the two tests correlated well with the titre of HIV-1/2 antibodies in the sera samples. The strongly positive samples having a high absorbance value, ranging between 1.5 and 2.0, measured in terms of O.D. at 450 nm in an ELISA reader had an excellent pattern of reactivity in Western Blot. The samples with weak or moderate positivity in ELISA, with an O.D. ranging between 0.5 and 0.7, did not react with Western Blot. A rise in HIV infection from 0.124% to 0.376% was observed. Two samples were reactive to HIV-2 by Western Blot. Among all the HIV-positive leprosy patients, there were no other co-infections like Hepatitis B, Syphilis and RA. Out of the 8 HIV-leprosy co-infected patients, 2 each were BT and BL types, 3 were BB and 1 was LL type of leprosy.

The predominant clinical features were hypo-pigmented lesions, clawing of fingers and toes, pain, and hand muscle atrophy. Whereas 4 patients had deformity in hands, only one of them reported acute pain. All the patients completed a full course of standard anti-leprosy multi-drug therapy, responded satisfactorily, and were later clinically and bacteriologically negative. The initial bacterial index, prior to treatment, which ranged between 2+ and 3+ became negative on completion of the treatment. Two of the 8 HIV-leprosy co-infected patients (BL, LL) became bacteriologically negative after 6 months and another 2 (BT, BL) became negative after 24 months of treatment (Table 2). We have observed that following treatment, B.I. became negative even in BL and LL cases. The HIV-positive

I Phase <sup>a</sup> (N = 4025)		HIV status				HIV status	
		EIA	WB	II Phase <sup>b</sup> ( $N = 2125$ )		EIA	WB
Borderline-				Borderline-			
Tuberculoid (BT) 1	888 (46.90%)	2	2	Tuberculoid (BT)	646 (30.48%)	2	1
Tuberculoid (TT)	141 (3.50%)	1	1	Tuberculoid (TT)	19 (0.89%)	0	0
Indeterminate (I)	30 (0.74%)	0	0	Indeterminate (I)	21 (0.98%)	0	0
Lepromatous-				Lepromatous-			
Leprosy (LL)	751(18.65%)	1	0	Leprosy (LL)	324 (15.24%)	2	2
Borderline-				Borderline-			
Lepromatous(BL)	600 (14.90%)	1	0	Lepromatous (BL)	610 (28.70%)	2	1
Mid-				Mid-			
Borderline (BB)	415 (10.31%)	0	0	Borderline(BB)	332 (15.62%)	2	2
Neuritic (N)	200 (4.96%)	0	0	Neuritic (N)	173 (8.14%)	0	0

 TABLE 1. The phase-wise screening of leprosy patients for HIV-1/2 infection.

<sup>a</sup> denotes I Phase of HIV screening of the leprosy patients which was from April, 1989 to March, 1993. <sup>b</sup> denotes II Phase of HIV screening of the leprosy patients which was from September, 1999 to March, 2004.

EIA = ELISA, WB = Western Blot.

patients are being followed up at six month intervals. On follow-up, to date none of the patients with HIV-1 infection have progressed into a more severe form of the disease. None of the co-infected cases have been lost so far in follow-up. In these coinfected patients, it is difficult to assess which infection occurred first. Our results indicated that HIV-1 infection does not contribute in any way to the precipitation of serious forms of leprosy.

#### DISCUSSION

It is well recognized that HIV infection constitutes a major risk factor for tuberculosis (TB) and for other mycobacteria, such as *M. avium* and *M. intracellulare*, but there are still uncertainties regarding its association with leprosy. The association between the HIV and tuberculosis and certain other non-tuberculous mycobacterial infections have been established (20, 21). Potential effects of HIV infection on leprosy have been suggested and discussed by several authors but, despite expectations, little interaction has been observed uptil now (9, 17, 22). Although an association between HIV and leprosy has been described in Zambia (<sup>18</sup>) and in Tanzania (27, 28), there is some evidence from studies in Mali (15), Ethiopia (6,7) and in other African countries that HIV infection is not a risk factor for leprosy (<sup>14, 16</sup>). On the contrary, a few studies carried out in some African countries to determine the association between leprosy and HIV infection suggest that HIV infection is an important risk factor for leprosy (<sup>4, 18</sup>). Some of these studies had limitations in study design and some found no association between the two diseases (<sup>2, 13</sup>).

The increase in HIV infection as compared to that of the first phase is disturbing and the mode of transmission appeared to be heterosexual as revealed during the posttest counselling session. None of the coinfected cases admitted to having a homosexual relationship or had a history of blood transfusion. Two of the males had symptoms of STDs at the time of testing.

The trend over a decade suggests that HIV infection is low among the leprosy patients when compared with other risk groups, like TB patients, which is 4.3% (26/600) in Agra (in press). The prevalence and incidence for HIV infection in Agra varies in different groups. Our institute has a Voluntary Confidential, Counselling and Testing Center (VCCTC), a State body of the National AIDS Control Organization (NACO), where screening for HIV infection is carried out routinely from different groups, namely, Volunteers (individuals opting for voluntary HIV testing), HIV-suspected cases referred from different hospitals, female sex workers (FSWs), residents at the Government Protective Home, and cases referred by District Jail and District Magistrate, Agra. The recent annual figures (Jan. through

		Clinical findings				
		Skin Lesions	Nerves	Pain	Deformity	
1	BL	>5	5	Pain	Nil	Smear 3+ (Negative after 24 months)
2	BL	>5	4	Nil	Nil	Smear 2+ (Negative after 6 months)
3	BB	>5	1	Nil	Nil	Negative
4	BT	1	Nil	Nil	Nil	Negative
5	LL	>5	4	Nil	Hand	Smear 3+ (Negative after 6 months)
6	BB	1	4	Nil	Hand	Negative
7	BB	>5	6	Nil	Nil	Negative
8	BT	>5	4	Nil	Hand	Smear 3+ (Negative after 24 months)

TABLE 2. Clinical presentations and bacteriological index among the HIV-leprosy coinfected patients.

Dec., 2004) revealed that the local prevalence and incidence of HIV-positivity in the area is, 40.31% (156/387) among Volunteers and 43.39% (46/106) among the Referred cases (communicated).

In the second phase as compared to that of the first phase, the OPD attendance of a few types of leprosy patients has risen during the study phase, whereas others have declined. A striking feature which has emerged during the second phase of the study is that there is an increase in the attendance of BB and BL types of leprosy patients, whereas there is a decrease in the BT and TT types of leprosy patients as depicted in Table 1. This could be one of the reasons for the higher HIV-positivity observed among the BB and BL cases. Another one could be attributed to the better control due to multi-drug therapy (M.D.T.) and decreased transmission of *M. leprae*, with new cases dominated by a long period of incubation, in the lepromatous leprosy cases. Although the number of leprosy patients screened for HIV infection in the second phase is less as compared to those screened during the first phase, a rise in HIV infection is disturbing since this area appears to be endemic for both the infections.

Expansion of the HIV epidemic could have a significant effect on the epidemiology of leprosy. In this study, it appears that neither of the infections precipitated the other. The incidence of downgradation, as well as reversal reactions and neuritis (both chronic and acute), was not observed among the leprosy patients. None of them developed Erythema Nodosum Leprosum (ENL) reactions. The total cases of HIV-positive leprosy patients were only thirteen in both the phases (5 in phase I, and 8 in phase II), which have been followed up very carefully and with special care. We have also observed that reversal reactions and ENL did not occur among any of the HIV-leprosy coinfected cases. If the number of cases were more, then probably one might have noted some reversal or ENL reactions. To resolve the issue, a larger study, with longer followup is required. Clinical manifestations of lepromatous leprosy cases might be immunologically mediated and these features could be abrogated by HIV infection.

Similarly, the HIV-positive leprosy cases did not develop either AIDS related complex (ARC) or full blown case of AIDS. None of the co-infected cases have been lost so far in the follow-up. This is the first report of a decade of HIV screening of leprosy patients in this region of the country and the longest follow-up of the largest number of HIVleprosy co-infected cases. Other studies have reported follow-up of very less number of the co-infected cases  $(^{11, 26})$ . The underlying mechanism by virtue of which the severity of both the diseases is lowered is not known. The infectious agents and host defences seem to have co-evolved to reach balanced states where virus and host survive. While HIV has not quite yet reached an optimal balance, tuberculosis (TB), leprosy, HBV, HCV in humans or lymphocytic choriomeningits virus (LCMV) in mice have successfully established persistence (<sup>29</sup>).

Although the present study does not show any association between HIV and leprosy, future study is warranted to find out the reasons for cross-protection, if any, at the genetic and molecular level.

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# Seroprevalence of Syphilis in HIV positive Patients

KEYWORDS	Window period, HIV, Syphilis, CD 4			
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**ABSTRACT** Syphilis is a sexually transmitted disease caused by a type of bacteria known as Spirochete, which occurs only in human beings. It is extremely small and can live almost anywhere in the body. The incidence of syphilis is rising all over the world partly due to the increased transmission in HIV and other high risk groups such as sex among the same sex. Syphilis itself facilitates HIV infection in several ways. AIDS/HIV caused by retro virus also has one of the modes of transmission by sexual contact. The present study aims to find out manifestation of syphilis in the context of HIV infected patients. Secondly to find out the age group and sex more prone to syphilis-HIV co infection as untreated syphilis can also cause major birth defects if the pregnant woman suffering from the disease and has not been effectively treated for the studies than the females and between the age group 26-35 years i.e. the reproductively active age group.

#### INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) was first recognized in USA in 1981. In India the first cause of HIV/AIDS was reported in 1986 from Chennai in a commercial sex worker. Human immunodeficiency virus belongs to class of Retro virus and sub family lentivirinidae. It is rapidly mutating virus.

Syphilis a sexually transmitted disease (STD) caused by a type of bacteria known as Spirochete -Treponema palladium which occurs only in human beings. It is extremely small and can live anywhere in the body. The treponema enters the body through minute abrasions on the skin or mucosa. The infection can also be passed from a mother to her baby during pregnancy.

HIV and syphilis affect similar patient groups and co infection is common. Detection and treatment of syphilis can therefore help to reduce HIV transmission.

In both the sexes, T. palladium can spread throughout the whole body, infecting major organ. Brain damage and other serious health problems can occur most of are difficult to treat. Untreated syphilis disease of pregnant woman can also cause major birth defects. Syphilis also increases the risk of HIV infection because HIV can enter the body more easily when there is a sore present.

Early stages of syphilis are easily cured with antibiotics. Someone who has been infected for a while will need treatment for a longer period of time. Unfortunately, damaged to the body from the late stage of syphilis cannot be treated. Relapse of infection is more likely in the HIV positive patient and careful follow up is required.

#### Mode of infection/Transmission

HIV is transmitted by both homosexual and heterosexual contact, by blood and blood products, and by infected mothers to infants either intrapartum perinatal or via breast milk.

HIV infection is predominantly a sexually transmitted disease (STD). The virus appears to concentrate in the seminal fluid, particularly in situations where there are increased numbers of lymphocyte and monocyte in the fluid, as in genital inflammatory states such as urethritis and epididymitis conditions closely associated with other STD. The risk of acquiring HIV infection enhances if genital ulcers are present as in syphilis or chancroid. The Spirochetes causing syphilis can pass from one person to another through direct contact with syphilis sore during sexual intercourse. The infection can also be passed from a mother to her baby during pregnancy. HIV and syphilis coinfection is also common among voluntary and replacement donors.

#### Symptoms of syphilis

The spirochete produces a classic, painless ulcer known as a chancre. There are three stages of syphilis, along with an inactive (latent) stage. Formation of an ulcer (chancre) is the first stage, with an average time of 21 days following infection is highly contagious when the ulcer is present. In most women, an early infection resolves on its own, even without treatment. However, 25% will proceed to the second stage of the infection called "secondary" syphilis, which develops weeks to months after the primary stage and lasts from four to six weeks. Secondary syphilis is a systemic stage of the disease, meaning that it can involve various organ systems of the body. In this stage, patients can initially experience many different symptoms, like skin rash, hair loss, sore throat, white patches in the nose, mouth, and vagina, fever, and headaches. There can be lesions on the genitals that look like genital warts but are caused by spirochetes rather than the wart virus Subsequent to secondary syphilis, some patients will continue to carry the infection in their body without symptoms. This is the so-called latent stage of the infection. Then, with or without a latent stage, which can last as long as 20 or more years, the third (tertiary) stage of the disease can develop. At this stage, syphilis usually is no longer contagious. Tertiary syphilis is also a systemic stage of the disease and can cause a variety of problems throughout the body including: heart problems, the development of large nodules (gummas) in various organs of the body; infection of the brain (stroke, mental confusion, meningitis), problems with sensation, or weakness (neurosyphilis); involvement of the eyes leading to sight deterioration; or involvement of the ears resulting in deafness. The damage sustained by the body during the tertiary stage of syphilis is severe and can even be fatal.

#### **HIV and Syphilis**

HIV and Syphilis are often seen as co- infections since they share a common mode of transmission. During episode of Syphilis ,CD4 counts transiently decrease and HIV viral load increase.

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Genital sores (chancres) caused by syphilis make it easier to transmit and acquire HIV infection sexually. There is an estimated 2 to 5 fold increased risk of acquiring HIV if exposed to that infection when syphilis is present. Ulcerative STD that cause sores, ulcers or break in the skin or mucous membrane such as syphilis disrupts barriers that provide protection.

#### **OBJECTIVES OF THE STUDY**

- Identification of HIV patients.
- Co infection of syphilis in HIV patients.
- To find out the age more prone to such co infections.

#### **MATERIALS & METHODS** Part A- Confirmation of HIV Experiment 1

A third generation sandwich ELISA (Enz Aids HIV 1/2) test was used for the detection of antibodies to HIV-1 and HIV-2  $\,$  in serum/plasma. 1 blank, 3 negative controls and 2 positive controls were used in the test. Negative and positive control was compared with test sample. According to the guidelines provided by NACO If Absorbance value is less than the cut off value than it should be considered non reactive and if absorbance value is greater, than cut off value should be considered reactive.(Guideline by NACO)

#### **Experiment 2**

Screening of antibodies to HIV type 1 and 2 was carried out using comb aid assay. Test is based on Immunoconcentration assay. Test is based on Immunoconcentration assay. Device employs solid phase capture technology, which involves the immobilization of HIV Antigen on porous membrane (Guideline by NACO).

#### Experiment 3

Third test was SD BIO LINE HIV1 & 2(Rapid test for HIV) based on Immunochromatography (lateral flow) assay.

Part-B- Test for Association of HIV positive & Syphilis patients.

Diagnosis of syphilis in HIV positive patients by VDRL (RPR test).

#### PRINCIPLE

Syphilis is a sexually transmitted (venereal) disease caused by the spirochete Treponema palladium . After infection the host forms Treponemal antibodies to Treponema palladium, in addition, the host also forms Non Treponemal antilipoidal antibodies in response to the lipoidal material released from the damaged host cell. These antibodies are traditionally referred as 'Reagins'. The Rapid Plasma Reagin (RPR)/ Carbon Antigen test is a macroscopic non Treponemal flocculation test for the detection and quantization of anti lipoidal . Non-Treponemal tests like CARBOGEN are of great value when used for screening and follow up of therapy.

During the testing procedure, the specimen, serum or plasma is mixed with the CARBOGEN reagent and allowed to react for eight minutes. If antilipoidal antibodies are present in the specimen, they will react with the CARBOGEN reagent forming visible black floccules. If antilipoidal are not present in the specimen, there will be no flocculation.

#### **Observations**

Total 256 samples were collected from patients attending Jawaharlal Nehru Hospital Ajmer were screened for syphilis & HIV. Out of 256 infected patients, there are 26 cases of syphilis. Seroprevelence is highest in age group 26-35 years

#### TABLE-1

Prevalence of Syphilis among various Age groups-				
Age group	Number	Percentage %		
0-15	2	7.69%		
16-25	7	26.92%		
26-35	8	30.76%		

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36-45	7	26.92%
46-55	2	7.69%
>55	0	0%
Total	26	

Out of 256 HIV infected patients ,there are 26 cases of Syphilis .Seroprevalence is highest in Age group -26-35 years.



Prevalence of Syphilis among different Sex group-				
Gender	Number	Percentage %		
Male	19	73.07%		
Female	7	26.92%		

Prevalence of Syphilis among Male patients higher73.07 % than Female.



#### Table-3

3

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Mode of Transmission of Syphilis among HIV positive patients.

Number	Percentage
0	0%
23	88.46%
3	11.53%
0	0%
	<b>Number</b> 0 23 3 0



#### Table-4

Mode of Transmission of HIV Mode of Transmission	positive patients. Number	Per-
centage		
Needle injury	12	4.68%
Sexual Transmission	220	85.93%
Patient to child Transmission	24	9.37%
Transfusion	0	0%



TABLE-5

Prevalence of HIV among different sex group				
Gender	Number	Percentage		
Male	170	66.40%		
Female	86	33.59%		



Prevalence of HIV among Male patients is higher than Female patients.

#### DISCUSSION

Syphilis is a complex disease, which is sexually transmitted. The incidence of syphilis is rising all over the world, partly due to the increased transmission in HIV patients. Recognition of both the diseases and their complex interactions need importance and cautious treatment as manifestations of syphilis in co infection with HIV make difficult diagnosis, management and cure, with various problems leading due to the co infection.

It is clear that apart from other infections, HIV infected individuals have high probability of getting co infected with syphilis. Multiple infection pose a small but definite risk to the recipients of blood product, voluntary donation are safer as compared with replacement ones and need to be encouraged (Kaur et al., 2010).

Mathai et al., 2002 reported that 31942 donors screened over a 6 year period, m mixed infections were seen in only 10 donors (0.03%).

Kaur et al., 2010 found that Syphilis infection can increase the susceptibility to HIV infection. HIV can alter the clinical course of Syphilis, increase the likelihood of relapse and cofound the diagnosis of neurosyphilis.

Swai and colleagues had reported age specific seroprevalence of Syphilis, in which the individual on the higher age group had higher seroprevalence.

Having Syphilis once does not protect a person from getting it again. Following successful treatment, people can still be susceptible to re infection ,because syphilis sores can be hidden in the vagina , rectum, or mouth it may not be obvious that a sex partner has syphilis.

The surest way to avoid transmission of sexually transmitted

diseases, including syphilis is to abstain from sexual contact or to be in a long term mutually monogamous relationship with a partner who has been tested and is known to be uninfected.

Rate of infection have increased since the turn of millennium in many countries often in combination with HIV .This has been attributed partly to unsafe sexual practices among men who have sex with men ,increased promiscuity, prostitute.

Congenital syphilis in the new born can be prevented by screening mothers during early pregnancy and treating those who are infected. World Health Organization (WHO) recommends that all women are tested at their first antenatal visit and again in third trimester. If they are positive they recommend that their partners also be treated. A number of measures to increase access to testing appear effective at reducing rates of congenital syphilis in low to middle groups.

Failure to diagnose and treat these devastating disease agents at an early stage may result in serious complications and segulae including infertility, fetal wastage, ectopic pregnancy, and genital cancer and premature death as well as neonatal and infant infection (WHO Guideline, 2003). HIV seropositivity was higher among the subjects aged between 15-34 years. This may be associated with higher sexual activities within these age groups. This suggests that women who are at the peak of their reproductive years are more prone to HIV infection. In all epidemiological studies, younger age has always proved to be the most important factors .The age of acquiring the infection is the major determinant of the incidence and prevalence rates. Since HIV prevalence among young pregnant women (15-24 years) is used as a proxy for measuring rates of new infections in population(Federal Ministry of Health Nigeria, Report, 2009). A risky sexual behavior are very common in India, while condom use remain low. The implications of HIV infection in pregnancy are serious. HIV seropositive pregnant women are significantly more likely to have recurrent vulvovaginitis , perineal tear, post partum hemorrhage, birth asphyxia and increased perinatal mortality(Obi.,2005) .There is also great risk of vertical transmission during parturition and breast feeding(Fawole et al.,2002). Swai and colleagues reported age specific seroprevalence of syphilis ,in which the individual in the higher age group had higher seroprevalence . It seems that people start having unprotected sex at young age and have extramarital relationships (Swai et al., 2006).

This research work showed that syphilis seroprevalence decreased with increasing level of education. Syphilis has long been known to be an important risk factor for adverse pregnancy out come. The consequences of untreated maternal infection include still birth, pre term live birth and also congenital infection in proportion of surviving infants. Women who work in the commercial sex industry differ from the general population in their increased vulnerability to infection and their potential for increased rate of such infections.

#### Conclusion

Seroprevalence of Syphilis is highest among Patients between the ages of 26-35 years ,which implies that syphilis infection is more common in adults.

Detection and treatment of syphilis can, therefore help to reduce HIV transmission. Syphilis may present with non typical feature in the HIV positive patients. There is a higher rate of symptomless primary syphilis and proportionately more HIV positive patient present with secondary infection. Secondary infection may be more aggressive and there is an increased rate of early neurological and ophthalmic involvement.

In both the sexes T. palladium can spread throughout the whole body, infecting major organs. Brain damage and other serious health problems can occur, most of them are difficult to be treated. A woman who is pregnant and has not been

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effectively treated is at higher risk of putting her baby in danger. Untreated syphilis can also cause major birth defects. Syphilis also increases the risk of HIV infection because HIV can enter the body more easily when there is a sore present.

Early stages of syphilis can be cured with antibiotics. If some person is infected will be required the treatment for a longer duration. Once the damage occur in the body from the late stage of Syphilis, it is difficult to treat.

All HIV positive patients should be treated with penicillin based regimen that is adequate for the treatment of neu-

rosyphilis. Relapses are more likely to occur in HIV positive patient and careful follow up is required.

We believe our data could help health professionals to deal better with co-infection with Syphilis in HIV infected patients. We also believe our data reinforces the need of prevention programs, which also lead to reduction in prevalence of syphilis in HIV infected patients.

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