

# HIV Infection and Sexually Transmitted Diseases in Central India

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## Abstract

Patients having sexually transmitted diseases are at a higher risk of acquiring HIV infection. The present study attempts to analyze the trend of HIV infection and the risk factors among STD clinic attendees in central India. Of the 2264 patients tested, 36 were sero-positive for HIV, giving a prevalence rate of 1.6%. HIV sero-positivity was almost constant over the years (2000 - 2004), thus indicating that central India continues to be a low prevalence area. Various factors associated with HIV infection were male sex, illiteracy and migration. Truck drivers and individuals having genital ulcers seemed to be more susceptible to HIV infection.

The study highlights a need for continuation and strict monitoring of the ongoing intervention program in order to maintain or reduce this low level of HIV prevalence.

## Introduction

There is a strong association between HIV infection and sexually transmitted diseases.[Kar et al, 2001] STD clinics are an important site for surveillance of HIV infection as they represent one of the high risk populations.[Ndogmo et al, 2003] 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 a rise.[Jain et al, 1994] Various factors like genital ulcer disease, sex work, lack of formal education, more number of lifetime sex partners[Mehendale et al, 1996] etc. have been shown to be associated with a high prevalence of HIV infection. In this study, the trend of HIV infection and risk factors among STD clinic attendees in central India is presented.

## Material and Methods

The present study was conducted at Voluntary Counseling and Testing Centre, Regional Medical Research Centre for Tribals (Indian Council of Medical Research), Jabalpur during the years 2000 to 2004. The study group comprised of subjects attending the STD clinic. A standard protocol was used to assess the medical history, demographic characteristics and risk behavior. Participants were examined for various STDs. Blood specimens were obtained and tested for HIV using WHO strategy II. First ELISA was performed using Recombigen HIV-1/HIV-2 EIA kit (Cambridge Diagnostics, Ireland) and Biotest Anti – HIV Tetra ELISA HIV-1 & 2 (Biotest AG, Germany). Sera positive by first ELISA were retested by Immunocomb II HIV 1 and 2 Bispot kit (Orgenetics Ltd., Israel) and Capillus HIV-1 /HIV-2 Assay (Trinity Biotech USA). Data were entered and analyzed using Microsoft Excel and the Statistical Package for Social Sciences (SPSS, Inc., Chicago).

## Results

Of the 2264 patients tested, 36 were sero-positive for HIV, giving a prevalence rate of 1.6%. Year wise break up of tested samples revealed almost a constant rate except a drop in 2001 (Table 1). The mean age of the group was 29.4 years, with a male to female ratio of 0.57.

Table 1: Year wise prevalence of HIV infection

Year	Tested	Positive	Percentage
2000	140	2	1.4
2001	153	1	0.7
2002	583	10	1.7
2003	638	10	1.6
2004	750	13	1.7
Total	2264	36	1.6

Table 2: Factors associated with HIV infection

Confounder		n	HIV positive (%)	Odds Ratio	p
Age	15-29	1144	19 (1.7)		
	30-44	967	16 (1.7)	1.00	> 0.05
	45+	153	1 (0.7)	2.56	> 0.05
Sex	Males	830	19 (2.3)		
	Females	1434	17 (1.2)	1.95	< 0.05
Locale	Urban	1468	24 (1.6)		
	Rural	796	12 (1.5)	1.08	> 0.05
Migration	Migrated	269	7 (2.6)		
	Not migrated	1995	29 (1.5)	1.81	> 0.05
Literacy	Illiterate	704	14 (2.0)		
	<5	635	12 (1.9)	1.05	> 0.05
	<12	664	9 (1.4)	1.47	> 0.05
	Graduate	261	1 (0.4)	5.27	> 0.05
Occupation	Driver	58	5 (8.6)		
	Agriculture	568	11 (1.9)	4.77	< 0.01
	Service	291	3 (1.0)	9.05	< 0.001
	Others	1347	17 (1.3)	7.38	< 0.001

Table 2 shows various demographic factors associated with HIV infection. The HIV seropositivity was more in males (2.3%) than in females (1.2%). There was no association of HIV infection with age. No significant difference was observed as far as locale is concerned (1.6% in urban and 1.5% in rural). There was a low prevalence in individuals seeking formal education (1.4%) as compared to illiterate individuals (2%). A higher prevalence was observed in migrated individuals (2.6%) than that in non migrants (1.5%). Alarmingly high (8.6%) HIV prevalence was seen in truck drivers.

Table 3: HIV sero-prevalence in various STDs

STD	Males		Females		Total	
	Number tested	HIV positivity (%)	Number tested	HIV positivity (%)	Number tested	HIV positivity (%)
Genital ulcers						
Syphilis	126	6 (4.7)	55	3 (5.4)	181	9 (4.9)
Herpes genitalis	24	0 (0)	25	1 (4.0)	49	1 (2.0)
Others	24	1(4.1)	20	0 (0)	44	1 (2.3)
Genital Discharges						
Gonococcal urethritis	207	3(1.4)	121	4 (3.3)	328	7 (2.1)
Nongonococcal urethritis	392	8 (2.0)	0	0 (0)	392	8 (2.0)
Vaginal discharge	-----	----	1101	8 (0.7)	1101	8 (0.7)
Other STDs	29	1 (3.4)	86	1 (1.1)	115	2 (1.7)
No STD	28	0 (0)	26	0 (0)	54	0 (0)
Total	830	19 (2.2)	1434	17 (1.2)	2264	36 (1.5)

The prevalence of HIV infection in various STDs is shown in table 3. In males, the commonest STD was non gonococcal urethritis, while in females the commonest manifestation was vaginal discharge. Genital ulcer disease constituted 12.1% (274/2264) of all STDs. Fifty-four individuals had no STD and had attended STD clinic apprehending some or the other STD. Individuals having genital ulcers seemed to be more susceptible for acquiring HIV infection (4% as compared to 1.3% in other STDs,  $p < 0.001$ ). Among various genital ulcers, highest prevalence was observed in syphilis (4.9%).

## Discussion

STD clinic attendees form a high risk group of the community as far as the transmission of HIV is concerned (Ndogmo et al., 2003). The present study showed an overall HIV prevalence of 1.6% in STD clinic attendees. Various studies have shown a high prevalence of HIV infection ranging from 2.8 % to 23.4% in patients attending STD clinic (Kar HK et al., 2001; Mehendale et al., 1996; Rodrigues et al., 1995; Deshmukh et al., 2000) and even with a past history of STD (Anvikar et al., 2005; Mayans et al., 2003). In view of this reported high prevalence of HIV infection, our study shows a comparatively low prevalence in this high risk group. Moreover, it has also been shown by various workers (Thapa et al., 1999; Kumar et al., 2000; van der Snoek et al., 2003) that the HIV prevalence among STD clinic attendees is showing an upward trend over the years; but

the present study indicates a constant prevalence. In fact, there was a drop in 2001, since the sample size was small in 2000 and 2001; significance may not be given to this finding.

We found a high proportion of HIV positivity among truckers. They have high-risk sexual behavior and contribute considerably in the spread of HIV infection throughout (Rao et al., 1999). Migration seems to increase the risk of HIV infection (Poudel et al., 2003). We found a higher (almost 2 fold) prevalence among the migrants as compared to that in non migrants. There was a low prevalence in individuals seeking formal education. Similar finding has also been observed in various studies (Mehendale et al., 1996; Rodrigues et al., 1995).

The study showed a strong association between genital ulcer disease and HIV infection. Similar finding has also been observed by various other workers (Deshmukh et al., 2000; Thapa et al., 1999). Ulcerative STDs can enhance both susceptibility of a person to HIV infection as well as infectivity of HIV positive individuals. Breach in the epithelial surface of a genital ulcer may be an important factor in the transmissibility of HIV (Vajpayee et al., 2000). Our study showed a high HIV prevalence in genital ulcerative diseases, particularly syphilis. Various genital ulcer diseases (Kura et al., 1998; Deshmukh et al., 2000; Vajpayee et al., 2000) particularly syphilis (Ndogmo et al., 2003; Pereira et al., 1992) appear to be significantly associated with HIV infection.

There is a wide variation in the prevalence of HIV infection in various regions of India due to geographical, cultural and behavioral patterns (Kumar et al., 2000). Madhya Pradesh still comes under the category of low prevalence states (NACO, 1998). HIV epidemic in various regions of India is progressing from a low level epidemic (HIV prevalence <5% in STD patients) to a concentrated epidemic (NACO, 1998). The constant low level of HIV prevalence over the years in the study area indicates that HIV epidemic is not progressing, unlike the situation in other parts of the country. In order to reduce the load of HIV infection, attempts should be made to control STI in order to reduce the efficacy of HIV transmission (Grosskurdt et al., 1995).

The study highlights an urgent need for vigorous intervention program in order to maintain this low level of HIV prevalence.

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#### References

- Anvikar AR, Chakma T, Rao VG. 2005. HIV Epidemic in Central India: Trends over 18 years (1986-2003). *Acta Tropica*. Vol.93 (3).pp289-294.
- Deshmukh AB, Damle AS, Anvikar AR. 2000. Epidemiology of Human Immunodeficiency Virus as a STD. Milestone. *The Journal of The Directorate, Medical Education and Research, Government of Maharashtra*. Vol.1.pp57 - 63.

- Grosskurt H, Mosha F, Todd J, et al. 1995. Impact of improved treatment of sexually transmitted diseases on HIV infection in rural Tanzania: randomised controlled trial. *Lancet*. Vol.346.pp530-536.
- Jain MK, John TJ, Keusch GT. 1994. A review of human immunodeficiency virus infection in India. *J Acq Immune Def Syndr*. Vol.7.pp1185 -1194.
- Kar HK, Jain RK, Sharma PK, et al. 2001. Increasing HIV prevalence in STD clinic attendees in Delhi, India: 6 year (1995-2000) hospital based study results, *Sex Transm Infect* . Vol.77.pp393.
- Kumar B, Gupta S. 2000. Rising HIV prevalence in STD clinic attenders at Chandigarh (north India) – a relatively low prevalence area. *Sex Transm Infect*. Vol.76.pp59.
- Kura MM, Hira S, Kohli M, et al. 1998. High occurrence of HBV among STD Clinic attendees in Bombay, India. *Int J STD AIDS*. Vol.9.pp1101 -1103.
- Mayans MV, Escriba JM. 2003. Prevalence of STI and risk of HIV infection in men. *Int J STD AIDS*. Vol.14.pp341-343.
- Mehendale SM, Shepherd ME, Divekar AD, et al. 1996. Evidence for high prevalence & rapid transmission of HIV among individuals attending STD clinics in Pune, India. *Indian J Med Res*. Vol.104.pp327 -335.
- National AIDS Control Organization. 1998. Country Scenario. New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.
- Ndogmo CB, Zekeg L, Kaptue L. 2003. Increased HIV prevalence among individuals attending a sexually transmitted infection clinic in Yaounde, Cameroon. *Int J STD AIDS*. Vol.14.pp189 -192.
- Pereira LH, Embil JA, Haase DA, et al. 1992. Prevalence of human immunodeficiency virus in the patient population of a sexually transmitted disease clinic: Association with syphilis and gonorrhoea. *Sex Transm Infect*. Vol.19.pp115-120.
- Poudel KC, Okumura J, Sherchand JB, et al. 2003. Mumbai disease in far western Nepal: HIV infection and syphilis among male migrant returnees and non migrants. *Trop Med Int Health*Vol. 8.pp933—939.
- Rao KS, Pilli RD, Rao AS, et al. 1999. Sexual lifestyle of long distance lorry drivers in India: Questionnaire survey. *BMJ*. Vol.318.pp162-163.
- Rodrigues JJ, Mehendale SM, Shepherd ME, et al. 1995. Risk factors for HIV infection in people attending clinics for sexually transmitted diseases in India. *BMJ*. Vol.311.pp283 -286.
- Thapa DM, Singh S, Singh A. 1999. HIV infection and sexually transmitted diseases in a referral STD clinic in south India. *Sex Transm Infect*.Vol.75.pp191.
- Vajpayee M, Malhotra N, Seth P, et al. 2000. HIV seropositivity in women with syphilis in Delhi, India. *Sex Transm Infect*. Vol.75.pp59-60.
- Van der Snoek EM, Gotz HM, Mulder PG, et al. 2003. Prevalence of STD and HIV infections among attenders of the Erasmus MC STD clinic, Rotterdam, The Netherlands, during the years 1996 to 2000. *Int J STD AIDS*. Vol.14.pp119—124.

