# 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 toreduce the load of HIV infection, attempts should be made to control STI in order to reduce the efficacy of HIV transmission (Grosskurt 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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