

Clinical patterns of sexually transmitted diseases in human immunodeficiency virus-infected individuals in a tertiary care center in South India

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Abstract

Background: Human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs) synergize to aggravate the associated morbidity of each other in the human body. **Aims:** The aim was to study the pattern of presentations of STDs in patients with HIV. **Materials and Methods:** This study was conducted by selecting 100 consecutive cases of HIV infection with symptoms suggestive of co-existing STD attending the outpatient department in a tertiary care center in south India. **Results:** Most of the patients belonged to the age group of 26–30 years, with a slight male preponderance. Genital ulcer was the predominant presenting complaint (60%), followed by dysuria (32%) and genital growth (29%). Genital ulcer was the most common lesion (56%), followed by other genital lesions (37%) and extragenital lesions (18%). Among the investigations, Tzanck smear was most commonly seen positive (62.3% of 61 patients), followed by positive potassium hydroxide mount and Venereal Disease Research Laboratory. About 35.5% of the male patients and 60.53% of the female patients had multiple diagnoses. In males, herpes genitalis (29.76%) was the most common STD, followed by condyloma accuminata (23.08%). In females, candidal vulvovaginitis (28.12%) was the most common STD, followed by herpes genitalis (23.43%). **Conclusion:** Our study found genital ulcer as the most common symptom and sign of STD in HIV-infected patients. Herpes genitalis was the most common STD among males and candidal vulvovaginitis was the most common STD among females.

Key words: Genital ulcer, herpes genitalis, human immunodeficiency virus, sexually transmitted disease

INTRODUCTION

Sexually transmitted diseases (STDs) are a loosely defined constellation of infections and syndromes that are epidemiologically heterogeneous, but all of which are more often than not transmitted sexually.^[1] Human immunodeficiency virus (HIV) infection is a major cause of illness, long-term disability, and death,

with severe medical and psychological consequences for millions of men and women. HIV and other STDs synergize to aggravate the associated morbidity of each other in the human body. The effective management of one condition produces a better outcome of not

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only the treated condition but also the existing comorbid condition. The epidemic has ample scope for further growth if efforts are taken to prevent onward transmission of HIV from drug injectors and the clients of sex workers to their other sex partners.^[2] Until a cure or vaccine for HIV infection is found, the only way to prevent the spread of the disease is by changing people's behavior through AIDS education programs.^[3] The presence of sexually transmitted infections, use of condoms, circumcision, and history of blood transfusion are probable factors responsible for serodiscordance or seroconcordance in HIV-positive cases.^[4]

STDs increase the risk of transmission of HIV infection causing an immense need to understand the patterns of STDs prevailing in the regions of a country for proper planning and implementation of STD control strategies. The availability of baseline information on the epidemiology of STDs and other associated risk behaviors remains essential for designing, implementing, and monitoring successful targeted interventions.^[5] This study was conducted to understand various presentations of STDs in the existing HIV scenario.

MATERIALS AND METHODS

This was a cross-sectional study conducted by including one hundred consecutive cases of HIV infection with symptoms suggestive of co-existing STD among patients attending the outpatient department in a tertiary care center in South India over a period of 2 years. After obtaining the informed consent, a questionnaire was used to record the patient's name, age, sex, marital status, educational and economic status, occupation, sexual behavior, menstrual cycles, and pregnancy status (in female patients). A thorough clinical history was elicited. Furthermore, history regarding sexual behavior was taken, not limiting to the present complaint, but in a lifetime. Clinical examination included general physical examination followed by a meticulous examination of the external genitalia and anal region and systemic examination. The following investigations were carried out in appropriate patients – 10% potassium hydroxide (KOH) mount, wet mount, tissue smear, Tzanck smear, Gram's stain, culture for *Neisseria gonorrhoeae*, dark field microscopy (DGM), and Venereal Disease Research Laboratory (VDRL) test. DGM was done in genital ulcer patients with suspected chancre cases.

Statistical methods

Chi-square test/Fisher's exact test has been used to find the significant association of presenting complaints and diagnosis between male and female HIV patients. The statistical software, namely

SPSS 15.0 (Statistical Software for social sciences, version 15.0, Chicago, USA) used for the analysis of the data and Microsoft Word and Excel have been used to generate graphs and tables.

RESULTS

A total of 100 patients were included in the study. The youngest in the present study was a 15-year-old boy and a 15-year-old girl and the eldest patient was a 60-year-old male. The maximum number of patients belonged to the 26–30 years age group (26%), followed by the 31–35 years age group (24%). The male-to-female ratio was 1.63:1. The age and sex distribution is shown in Table 1. Most of them belonged to the lower class (80%); the remaining 20% of the patients were from the middle class. The social and personal data are shown in Table 2. In our study, 40.3% ($n = 25$) of the males were unmarried, while 7.9% ($n = 3$) of the females were unmarried.

The presenting complaints are tabulated in Table 3. Fifty-nine percent of the patients presented with single complaints, whereas 41% of the patients presented with multiple complaints. Genital ulcer disease was the predominant presenting complaint, accounting for 60% of all the complaints, followed by dysuria 32%, which is closely followed by genital growth complaint (29%).

The mean age of sexual debut in the current study was 20.01 ± 3.78 years. About 16.1% ($n = 10$) of the male patients and 2.6% ($n = 1$) of the female patients practiced anal sex; accounting for overall of 11% of the total patients. Condoms were used by 19.4% ($n = 12$) of males and 23.7% ($n = 9$) of females' partners, accounting for usage of condoms among 21% of the total patients. There were two pregnant female patients in our study [Graph 1].

All the male patients (62) had multiple partners in the study and 13 of 38 (34.2%) female patients had multiple partners. Overall, 75% of all patients had multiple sexual partners. Almost 83.9% ($n = 52$) of the male patients had heterosexual practices, whereas all the female patients were heterosexual.

Table 1: Age and sex distribution

Age (years)	Males	Females	Total
15-20	2	5	7
21-25	12	6	18
26-30	14	12	26
31-35	12	12	24
36-40	13	1	14
>40	9	2	11
Total	62	38	100

Table 2: Social-personal characteristics of the data

Social personal characteristics	Male (n=62), n (%)	Female (n=38), n (%)	Total (n=100), n (%)
Residence			
Outside Bangalore	35 (56.5)	5 (13.2)	40 (40.0)
Bangalore	27 (43.5)	33 (86.8)	60 (60.0)
Education			
Nonliterate	11 (17.7)	10 (26.3)	21 (21.0)
7 th standard	18 (29.1)	15 (39.5)	33 (33.0)
8-12 th standard	25 (40.3)	11 (28.9)	36 (36.0)
Degree	8 (12.9)	2 (5.3)	10 (10.0)
Socioeconomic status			
Lower class	47 (75.8)	33 (86.8)	80 (80.0)
Middle class	15 (24.2)	5 (13.2)	20 (20.0)
Higher class	-	-	-
Marital status			
Single	25 (40.3)	3 (7.9)	28 (28.0)
Married	32 (51.6)	20 (52.6)	52 (52.0)
Divorced/breakup	1 (1.6)	5 (13.2)	6 (6.0)
Widowed	4 (6.5)	10 (26.3)	14 (14.0)
Occupation			
Coolie/attender	21 (33.9)	15 (39.5)	36 (36.0)
Private/business/etc.	18 (29.1)	8 (21.1)	26 (26.0)
Drivers	14 (22.6)	-	14 (14.0)
Housewife	-	12 (31.6)	12 (12.0)
Student/unemployed	6 (9.7)	1 (2.6)	7 (7.0)
Farmer	3 (4.8)	-	3 (3.0)
CSW	-	2 (5.3)	2 (2.0)

CSW=Commercial sex workers

Table 3: Presenting complaints

Presenting complaints	Male (n=62), n (%)	Female (n=38), n (%)	Total (n=100), n (%)
Multiple complaints	26 (43.5)	15 (39.5)	41 (41.0)
Dysuria + genitalulcer	5 (19.2)	5 (35.7)	10 (25.0)
Genital ulcer + growth	6 (23.1)	-	6 (15.0)
Genital ulcer + vaginal discharge	-	6 (42.9)	6 (15.0)
Urethraldischarge + dysuria	6 (23.1)	-	6 (15.0)
Dysuria + genitalgrowth	1 (3.8)	-	2 (5.0)
Growth + dysuria	1 (3.8)	-	1 (2.5)
Urethral discharge + genital ulcer	1 (3.8)	-	1 (2.5)
Genital growth + vaginal discharge	-	1 (7.1)	1 (2.5)
Inguinal swelling + dysuria	-	1 (7.1)	1 (2.5)
Vaginal discharge + dysuria	NA	1 (7.1)	-
Urethral discharge + dysuria + genital ulcer	5 (19.2)	-	5 (12.5)
Inguinal swelling + genital ulcer + urethral discharge	1 (3.8)	-	1 (2.5)
Vaginal discharge + dysuria + genital ulcer	NA	1 (7.1)	-

NA=Not available

Nearly 4.8% ($n = 3$) of the males practised homosexual sex exclusively, whereas 11.3% ($n = 7$) of the males were bisexuals [Graph 2]. In this study, 91.9% ($n = 57$) of the male patients had sex with commercial sex workers (CSWs). Almost 95.2% ($n = 59$) of the males and 42.15% ($n = 16$) of the females had sexual encounters with friends, acquaintances, or casual partners.

In the present study, 91.9% ($n = 57$) of the male patients were uncircumcised. Nearly 41% of the

patients had inguinal lymphadenopathy. About 24.2% ($n = 15$) of the male patients had urethral discharge and 39.5% ($n = 15$) of the female patients had vaginal/cervical discharge. Genital ulcer was noted in 56% of the total patients. Other genital lesions (e.g., warts, molluscum) were seen in 37% of the total patients. Extragenital lesions were noted in 18% of the total patients [Graph 3].

Of the 100 seropositive patients, 10 patients (14.5% [$n = 9$] of male patients and 2.6% [$n = 1$]

of female patients) had a reactive VDRL test. 5.3% of the 38 female patients ($n = 2$) showed *Trichomonas vaginalis* on wet mount. About 47.4% of the 38 female patients ($n = 18$) showed *Candida* species on KOH mount. Gram staining was done in 49 males of which 8.2% ($n = 12$) were positive for *Haemophilus ducreyi* and 16.3% ($n = 7$) were positive for *N. gonorrhoeae*. Gram staining was done in 35 females of which 20% ($n = 7$) were positive for *H. ducreyi* and none were positive for *N. gonorrhoeae*. Of the 61 patients in whom Tzanck test was done, 38 patients (62.3%) showed multinucleated giant cells suggestive of herpes genitalis infections. About 33.3% ($n = 5$) of 15 males whose urethral discharge was cultured for *N. gonorrhoeae* showed positivity, whereas none of the six female samples were positive for *N. gonorrhoeae*. Nearly 13.9% ($n = 5$) male patients showed treponemes on dark ground microscopy, while 4% ($n = 1$) of the female patients showed positivity. One male and female patient each showed positivity for *Calymmatobacterium granulomatis* on tissue smear [Graph 4].

In the current study, 35.5% ($n = 22$) of the male patients and 60.53% ($n = 23$) of the female patients had multiple diagnoses. Among males, herpes

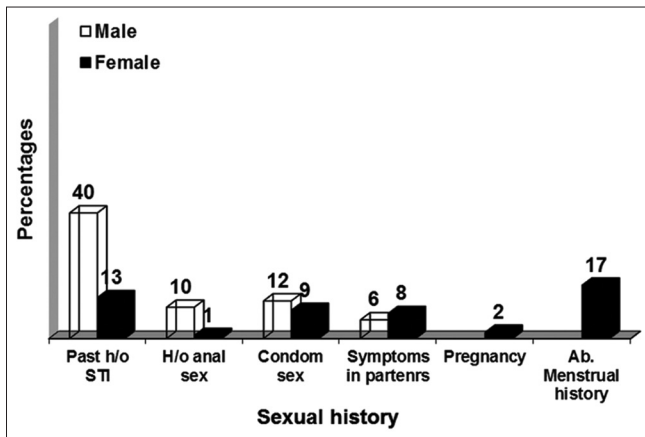
genitalis (29.76%) was the most common STD, followed by condyloma accuminata (23.08%). In females, candidal vulvovaginitis (28.12%) was the most common STD, followed by herpes genitalis (23.43%) [Table 4].

DISCUSSION

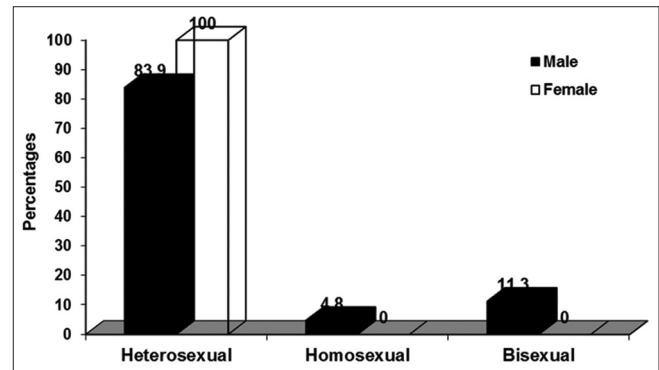
In the present study, the maximum number of patients belonged to the 26–30 years age group (26%), followed by the age group of 31–35 (24%) years. Similar results were found by Marfatia et al.^[6] where the most common age group affected was 26–30 years age group (27.39%), followed by 31–35 years (23.91%). Similar findings were reported by other studies^[7-10] where the maximum number of patients was between the 20 and 40 years group.

The mean age of sexual debut was 20.01 ± 3.78 years. Males debuted at 20.52 ± 3.6 years, whereas females debuted at 19.18 ± 3.84 years. In several Indian studies, the average of sexual debut in clinic attendees has been observed to be between 15 and 20 years, which is in accordance with the current study.^[11]

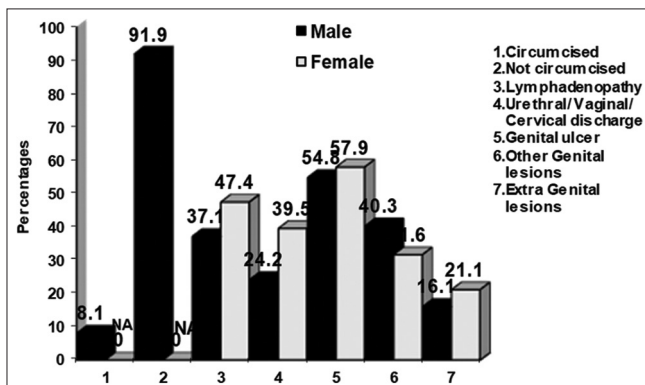
Usage of condoms was 21% in the present study. Similar results were obtained by Nair et al.^[8] where 67.76% had unprotected sexual contact, while 29.75%



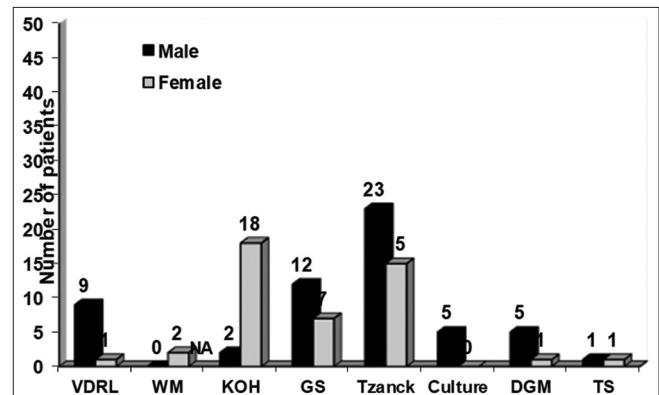
Graph 1: Pattern of sexual behavior among the study population



Graph 2: Sexual preference among the study population



Graph 3: Various clinical findings among the study population



Graph 4: Positivity of various investigations among the study population

Table 4: Diagnosis

Diagnosis	Male (n=62), n (%)*	Female (n=38), n (%)**	Total (n=100), n (%)***
HG	25 (29.76)	15 (23.43)	40 (27.02)
CA	20 (23.08)	6 (9.37)	26 (17.56)
NGU	12 (14.28)	8 (12.50)	20 (13.51)
CVV	NA	18 (28.12)	18 (12.16)
Ch	4 (4.76)	7 (10.93)	11 (7.43)
Sy	9 (10.71)	1 (1.56)	10 (6.76)
GU	8 (9.52)	-	8 (5.40)
MC	1 (1.19)	4 (6.25)	5 (3.38)
Tr	-	2 (3.12)	2 (1.35)
G.Sc	1 (1.19)	1 (1.56)	2 (1.35)
CBP	2 (2.38)	NA	2 (1.35)
LGV	1 (1.19)	1 (1.56)	2 (1.35)
GI	1 (1.19)	1 (1.56)	2 (1.35)

*62 male patients had 84 diagnoses (22 male patients had two different STD diagnoses); **38 female patients had 64 diagnoses (20 female patients had two different STD diagnoses, and 3 female patients had three different STD diagnoses); ***Total patients in the present study were 100 but since 45 patients had more than one disorder, the total number of disorders in the present study is 148. (42 patients had two different STD diagnoses and 3 patients had three different STD diagnoses, giving a total of 148 diagnoses). NA=Not available; STD=Sexually transmitted disease; HG=Herpes Genitalis; CA=Condyloma acuminata; NGU=Non-Gonococcal Urethritis; CVV=Candidal Vulvovaginitis; GU=Gonococcal Urethritis; MC=Molluscum Contagiosum; CBP=Candidal Balanoposthitis; LGV=Lymphogranuloma Venereum; GI=Granuloma Inguinale

of patients had at least one contact protected by the use of condoms. In another study, only 8.34% of STD patients had reported consistent use of condoms during their nonmarital sexual encounters.^[12]

Seventy-five percent of all patients had multiple sexual partners and 25% had a single partner. Banerjee *et al.* found that 3% of the subjects had no sexual partner, 2% had sex only with the spouse, 15% had 1–3 sex partners apart from the spouse, 11% had 4–7 sex partners, 10.5% had 8–10 partners, while a whopping, 58.5% had more than 10 partners during the past 1 year.^[3] The risk of exposure to an STD is directly associated with the number of lifetime sexual partners, rate of partner recruitment, and partner change.^[11]

In the current study, 91.9% of the male patients had sex with CSWs. Almost 95.2% of the males and 42.15% of the females had sexual encounters with friends, acquaintances, or casual partners. History of unprotected sexual intercourse with a CSW was elicited in 69.7% of the patients by Devi *et al.*^[12] Several studies conducted in India show that majority of the male patients (74.5%–89%) give a history of contact with CSW, which is in accordance with the present study.^[11]

In the current study, 83.9% of the male patients had heterosexual contact, whereas all the female patients

had heterosexual contact. Nearly 4.8% of the males indulged in homosexual activity exclusively, while 11.3% of the males were bisexuals. Heterosexual contact was also the most common type of sexual contact seen in 71.1% of patients, followed by bisexual contact in 5.78% and homosexual contact in 1.65%, in the study by Nair *et al.*^[8] In another study among patients with HIV seropositivity, the predominant mode of contact was heterosexual (138 patients, 91.4%), followed by bisexual (5 patients, 3.6%), and homosexual (2 patients, 1.2%). Seventy-six percent of the HIV-positive men had a history of contact with a CSW.^[13] According to Vora *et al.*, heterosexual contact was the most common type of sexual contact seen in 195 patients (97%), followed by bisexual contact in 5 (2.5%) patients and homosexual contact in 1 patient (0.5%).^[13] Narayanan found that, of the 686 patients, 658 (95.9%) were heterosexuals, while 19 (2.8%) were homosexuals and 9 (1.3%) were bisexuals. All the homosexual and bisexual patients were males.^[14]

In the present study, majority (91.9%) of the male patients were uncircumcised. Data from a prospective cohort study of Kenyan truck drivers^[15] were used to estimate per-sex act probabilities of female-to-male HIV-1 transmission by circumcision status. After accounting for sexual behavior, uncircumcised men were at an estimated >2-fold increased risk of acquiring HIV-1 per sex act, compared with circumcised men. Weiss *et al.* showed a strong protective effect of circumcision on chancroid and syphilis and a weak protective effect against HSV2 infection.^[16]

In our study, 64.5% of the male patients had a single diagnosis, while 39.47% of the female patients had a single diagnosis. Female HIV patients in the present study were 2.78 times more likely to have multiple venereal disease diagnoses when compared to male HIV patients with $P = 0.015$. In males, herpes genitalis (29.76%) was the most common STD, followed by condyloma acuminata (23.08%). In females, candidal vulvovaginitis (28.12%) was the most common STD, followed by herpes genitalis (23.43%). Candidalvaginitis is not considered as a sexually transmitted infection *per se* but has been included as it can be transmitted by sexual route.^[17]

Herpes genitalis was the most common condition in a study by Jayasree *et al.*, but seropositivity was greatest in patients with syphilis (36% vs. 30% in patients with herpes genitalis).^[18] Banerjee *et al.* found that, among the STD cases in HIV-positive patients, herpes genitalis was most common, followed by condyloma acuminata and nonherpetic genital

ulcer.^[19] According to Devi *et al.*, HIV seropositivity was more common in patients who presented with ulcerative STDs than with nonulcerative STDs.^[12] Multiple STDs were seen in 45% of the patients, while 55% of them had a single STD diagnosis. Twelve (7.7%) patients had more than one sexually transmitted infection in another study.^[18] According to Vora *et al.*, among the ulcerative group, herpes genitalis was the most common overall, followed by chancroid and syphilis. Among the nonulcerative group, genital warts were the most common, followed by genital molluscum contagiosum and the total incidence of urethritis was 10.94% of all STDs.^[13]

The findings of this study demonstrate genito ulcerative disease, the most common coexisting STD with HIV, is a major cofactor in the transmission in the HIV epidemic. Nsubuga *et al.*^[20] showed that a relationship exists between the history of STD and HIV; in addition, patients who had genital ulcer disease at the time of examination were more likely to have HIV than those who did not have genital ulcer disease. Hence, a greater attention has to be focused on the control of STDs, as there exists a strong correlation between the spread of conventional STDs and HIV transmission, and both ulcerative and nonulcerative STDs have been found to increase the risk of sexual transmission of HIV. Our study had few limitations including small sample size and single-center study. A large multicentric study is needed for knowing more about STDs and HIV.

CONCLUSION

Genital ulcer disease was the most common symptom or presenting complaint in patients with HIV and coexisting STDs. HIV patients can have multiple coexisting STDs. Viral STDs were the most common coexisting STDs with HIV, with herpes genitalis being most common. Female HIV patients are more likely to have multiple venereal diseases when compared to male HIV patients. Patients with HIV infection with coexisting STD should be subjected to careful clinical examination and also screened for other STDs too. Management of the patient needs a holistic approach, with partner management too being of par importance. Educating the public, particularly the young, about safe sex and condom usage needs to be greatly stressed upon.

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Conflicts of interest

There are no conflicts of interest.

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