Research Article

Spectrums of sexually transmitted infections in HIV-infected patients in a tertiary care teaching hospital

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Abstract

Background: Sexually transmitted co-infections increase HIV infectiousness through local inflammatory processes. The prevalence of STI among people living with HIV/AIDS has implications for containing the spread of HIV in general and the effectiveness of HIV treatments for prevention in particular.

Objective: The objective for this study is to elucidate the prevalence and spectrums of STIs in HIV-infected patients in the Gandhinagar Civil Hospital.

Materials and Methods: The evaluation of the prevalence and spectrums of STIs was conducted by using the clinical data of 834 HIV-infected patients in the Gandhinagar civil hospital from November 2012 to December 2013 who are attending physician OPD for STIs.

Results: The prevalence and spectrums of STIs varied contingent on sex, age, CD4 levels, and treatment with antiretroviral therapy (ART). We found that gonorrhea was most common STI with prevalence being 32.95%, followed by syphilis (21.68%), chlamydia (18.50%), herpes (17.05), tichomonas (6.36%), and chancroid (3.47%). Females (43.67%) are more prone to get STIs than males (40.15%). STIs in AIDS are more common in 21–40 years (58.33%) of age group. STI is more common in patients with CD4 count between 51 and 100 (86.96%) followed by 101–150 (85.71%). STI is more common in patients who are not on ART (53.41%) than those on ART (27.67%). We found that young age (21–30) was the only independent risk factor for infection with CT or GC among women receiving HIV continuity care, but prevalence was high in all age groups.

Conclusion: The prevalence and spectrums of STIs was discussed in this study. It would help increase the awareness for physicians to make a diagnosis and empirical treatment sooner and plan good management strategies, especially in resource-limited regions.

Introduction

The first case of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) in India was detected in 1986 in the state of Tamil Nadu[1] and since then the spread of HIV/AIDS across the nation has been relentless. Cases have been reported from all states and union territories of India.

Although data on HIV and STD prevalence among the high-risk groups[2–4] are available from India, the true prevalence of HIV in the community is not clear and estimates range from 1.7 to 4.1 million.[5–7]

Sexually transmitted infections (STI) are among the most well-established risk factors for HIV infection. STI facilitates HIV transmission by breaching protective mucosal barriers and recruiting susceptible immune cells (e.g., CD4 T-helper cells, macrophages) to the site of infection.[8]

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The association between ulcerative STI and HIV transmission is well established, with as many as half of newly HIV-infected people demonstrating herpes simplex virus type 2 (HSV-2) infection.[9] STI can also cause genital bleeding, further increasing the risk of exposure to HIV during sexual activity.[10,11] Trichomoniasis and bacterial vaginosis, for example, can increase the risks for vaginal bleeding more than twelve times.[12]

The effects of HIV infection on immunity can increase susceptibility to other STI as individuals who are immune compromised are less able to mount a protective response against sexually transmitted pathogens.[13,14]

Sexually transmitted co-infections pose considerable health threats to people living with HIV/AIDS.

When individuals are immune compromised, co-occurring STI is more difficult to treat and symptomatic periods may linger.

Unfortunately, multiple sexually transmitted co-infections are common because the pathogens share transmission routes.[15]

There is growing evidence that antiretroviral therapies (ARTs) can reduce HIV infectiousness and prevent HIV transmission.[16]

The purpose of this study is systematically to review the research on the prevalence of HIV/STI co-infection. We examined the prevalence estimates of HIV/STI co-infection in people living with HIV/AIDS to provide a more realistic context for interpreting studies of the test and treat strategy and mathematical models that forecast the effects of ART on HIV transmission. Our review is based on the premise that increased genital infectiousness resulting from co-occurring STI will diminish the positive effects of reducing community-level blood plasma viral load. Our aim is therefore to examine the prevalence of HIV/STI co-infections better to inform efforts to scale up HIV treatment for prevention programs and evaluate the ongoing interventions to reduce the spread of STD and HIV in India.

Materials and Methods

Patient's Selection

After taking permission with ethical comity, hospital superintendent as well as from AIDS Control Society, this retrospective observational study was carried out at the GMERS Medical College, Gandhinagar attached with civil hospital.

We reviewed a series of 834 HIV-infected patients who were visiting to this hospital between November 2012 and December 2013. The attended patients presented some symptoms presumed to be due to STIs, who needed evaluation and treatment of HIV-related diseases. Patients completed a face-to-face, paper-and-pencil questionnaire eliciting data on age, gender, ethnicity, marital status, transmission routes, and address.

Diagnosis of STIs

The clinical specimens for microbiological studies collected from the selected population included vaginal and endocervical swabs from women, urethral swabs from men, and blood from all subjects.

Specimen preparation and transport

Vaginal swabs were immediately subjected to wet-film microscopy for trichomonasvaginalis (TV); urethral swabs and endocervical swabs were collected in charcoal transport media. Smears were prepared from the second swab and heat fixed. All clinical specimens were kept in an ice bath while processing. Each day they were transported to the coordinating microbiology laboratory for processing.

Bacteriological cultures

N. gonorrhea was diagnosed by culture (modified Thayer–Martin medium) and/or positive Gram-stained of endocervical swabs for Gram-negative diplococci. H. ducreyi was isolated from the swabs on oxoid chocolate agar with horse blood and vancomycin alone.

Serological studies

Serology for syphilis, HIV, HBV, and HSV-2 were conducted on the plasma/serum samples using commercial kits. The serological tests carried out for syphilis were RPR and TPHA. Double ELISA for HIV was carried out. Anti-HIV reactive samples were re-tested and confirmed by Western blot. IgM antibody to HSV-2 was tested by anti-HS V-2 ELISA kits. PCR test for the detection of C. trachomatis was done on urine samples. IgG antibodies to chlamydia trachomatis was assessed in serum by an ELISA test.

Others

Trichomoniasis was diagnosed using wet preparation, candidiasis by visual inspection of Candida species on potassium hydroxide (KOH) preparations or on Gram-stained vaginal swabs.

Results

Total 834 patients with HIV positive status have been included in the study. Five hundred eighteen (62.11%) patients were male and 316 (37.88%) were female with mean age 35.45 ± 13.54 years. We observed that STIs were more common in females (43.67%) than males (40.15%), but there is no clinical significant difference ($p = 0.317369$) has been found for STIs with gender distribution [Table 1]. We observed that STIs were more common in 21–40 years age group (58.33%) with p value being 0.0211, suggesting it to be significant [Table 2]. We found that among women in reproductive age group (21–40) CT or GC was more common among women in age group (21–30) as compared to women in age group (31–40) and the data were highly significant ($p = 0.001969$) [Table 4].

Table 1: Distribution of STIs according to gender

	No. of patients		
Gender	**With STIs**	**Without STIs**	**Total**
Male	208 (40.15)	310 (59.85)	518 (100.00)
Female	138 (43.67)	178 (56.33)	316 (100.00)
Total	346 (41.49)	488 (58.51)	834 (100.00)

χ^2: 0.9998; *p* value: 0.317369.

Table 2: Distribution of STIs according to age

Age group (Years)	With STIs (%)	Without STIs (%)	Total (%)
0–20	52 (48.60)	55 (51.40)	107 (100)
21–40	161 (58.33)	276 (41.67)	437 (100)
41–60	123 (46.95)	139 (53.05)	262 (100)
61–80	10 (35.71)	18 (64.29)	28 (100)
Total (%)	346 (41.49)	488 (58.51)	834 (100)

χ^2: 9.714; *p* value: 0.02116043.

Table 3: Effect of antiretroviral treatment

ART Status	With STIs (%)	Without STIs (%)	Total (%)
On ART	264 (40.12)	394 (59.88)	658 (100)
Pre ART	82 (46.59)	94 (53.41)	176 (100)
Total (%)	346 (41.49)	488 (58.51)	834 (100)

χ^2: 2.394; *p* value: 0.1218.

Table 4: Gonnorhea and chlamydia in different age groups in females

Age group (female)	With CT and GC (%)	Without CT and GC (%)	TOTAL (%)
21–30	48 (27.59)	174 (72.41)	222 (100)
31–40	23 (10.69)	192 (89.31)	215 (100)
Total (%)	71 (16.25)	366 (85.75)	437 (100)

χ^2: 9.5784; *p* value: 0.001969.

Table 5: STI in relation to CD4 count

CD4 Count	With STI (%)	Without STI (%)	Total (%)
<250 (%)	86 (35.83)	154 (64.17)	240 (100)
>250 (%)	260 (43.77)	334 (66.23)	594 (100)
Total (%)	346 (41.49)	488 (59.51)	834 (100)

χ^2: 4.4367; *p* value: 0.035175.

Spectrum of STIs

Gonorrhea is a sexually transmitted disease and it was the most common STI in this study (32.95). We found that gonorrhea was most common STI with prevalence being 32.95%, followed by syphilis (21.68%), chlamydia (18.50%), herpes (17.05), tichomonas (6.36%), and chancroid (3.47%).

Prevalence of STIs related to CD4 count: we observed that STIs are more common if CD4 count is greater than 250 (75.14%) as compared to patients having CD4 count less than 250 (24.86%) and the data are clinically significant ($p = 0.035175$) [Table 4].

Effect of ART: Though the prevalence of STIs was more in those who are not on ART (53.41%) as compared to those who are on pre-ART (40.12%), but the data are not clinically significant ($p = 0.1218$) [Table 3].

Discussion

The epidemiological synergy between STDs and HIV/AIDS has been established in many studies worldwide.[17–19] They have indicated a two- to five-fold increase in the risk of HIV infection in persons who have STDs, both ulcerative and non-ulcerative in nature.[20,21] With the advent of the HIV/AIDS epidemic in India, STDs have become a major public health problem. With the exception of a few studies from Africa,[20,22] there are no published reports on a population-based prevalence of STD and HIV in the community. The prevalence of HIV among commercial sex workers (CSWs) in India is reported to be as high as 47%3 and that of STD up to 80%.[23] In STD clinic attendees the seroprevalence of HIV is 21%.[24] HIV prevalence in antenatal mothers is rising and is 2–4% in some centers.[25] Antenatal data on HIV prevalence are available from many states in India and they show that there is a significant difference in prevalence across states and populations.

In India, HIV-infected patients were treated with ART based on guideline by NACO, which was administered through ART center, while STIs were treated by respected faculties at tertiary care hospital. Civil hospital attached with GMERS Medical College, Gandhinagar is having ICTC center for HIV/AIDS diagnosis ART Center for treatment and other specialized faculty such as physician and dermatologist to treat STIs and other complication. In this retrospective observational study, 834 HIV-infected patients came from different regions in Gandhinagar district.

We found in our study that patients in age group 21–40 (58.33%) are having STIs in HIV-infected patients. Thus, STIs occurred in economically productive years in these HIV-infected individuals that increased social-economic burden in India. Treatment of STDs and behavioral risk reduction may decrease HIV transmission in the community. Among women of reproductive age group (21–30) was the only independent risk factor for CT and GC, which is correlated with the study of Kathleen et al.[26] So our data suggest that in areas with high prevalence of STDs, HIV-infected women in reproductive age group should be routinely tested for STDs.

The data from the study by Thomas et al.[27] show that the disease is found equally in both genders, which is correlated with our study that show male 40.15% and women 43.67%. But no clinical significant difference ($p = 0.317369$) has been found for STIs with gender distribution.

We observed that there is no correlation between CD4 count and STIs in HIV positive patients. STI may occur in patients having CD4 count greater than 250 per cumm (45.95%) with p value being 0.035175, showing that data are not clinically significant regarding CD4 count. Our study showed that there is no significant correlation between STIs and their respective CD4 counts.[28]

There is no clinical significant difference in prevalence of STIs based on ART (p value =0.1218), which is correlated with Scheer et al.[29]

The prevalence of gonorrhea was 32.95%, followed by syphilis 21.68%, chlamydia 18.50%, and trichomoniasis 6.36% in this study, which is correlated with the study on series of 632,264 people living with HIV/AIDS in New York City. The three most common AIDS-defining illnesses were Chlamydia (20%), gonorrhea (31%), and syphilis (5%),[30] which was also similar to reports in Erbelding et al. studies.[31]

Conclusion

An accurate evaluation of the prevalence and spectrum of STIs helps to plan good management strategies, and behavioral part is more important to prevent STIs in HIV patients. STI control is a public health outcome, measured as reduced incidence and prevalence, achieved by implementing strategies composed of multiple synergistic interventions.

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