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Original Research Article

Seroprevalence of human immunodeficiency virus among reproductive age group females presenting with genital ulcer: study from a tertiary care centre in India

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ABSTRACT

Background: The co-existence genital ulcers either in the recipient or donor could potentially increase the risk of transmission of human immunodeficiency virus (HIV). Hence the meticulous clinical and serologic evaluation of females presenting with genital ulceration is important to curb the future spread of HIV.

Methods: A total 80 female patients within the age group 15-45 years presenting with genital ulceration were enrolled in the study done at tertiary care centre in Amritsar for a period of one year. Various investigations such as Tzanck smear, VDRL, gram staining, genital mucosal biopsy, HSV serology and HIV testing - ELISA and Tri dot were done on study participants.

Results: Out of 80 females, 8 patients with genital ulceration tested positive for HIV. Most common cause of genital ulceration in HIV positive female patients was herpes progenitalis (50%). Only 25% of HIV seropositive females were married rest were widowed or unmarried. History of condom use was absent in 62.5% of HIV positive females.

Conclusions: Pre-existing genital ulcers due to sexually transmitted diseases (STD) or due to non-STDs, inconsistent condom use, urbanization and pre/extra marital affairs are risk factors for the acquisition of HIV.

Keywords: Condom, Genital ulcer, Herpes progenitalis, Human immunodeficiency virus

INTRODUCTION

Genital ulcers in females due to sexually transmitted diseases (STDs) like syphilis, donovanosis, lymphogranuloma venereum, herpes genitalis or non STDs like traumatic ulcer, immunological diseases such as vesiculobullous disorders, lichen planus, erythema multiforme, lichen sclerosis et atrophicus, squamous cell carcinoma etc act as cofactor for Human immunodeficiency virus (HIV) transmission.¹ Lack of mechanical skin/mucous membrane/endocervical epithelial barrier facilitates entry, activation and promotes viral replication e.g. in tissue co-infected with HIV-I and Herpes simplex virus (HSV-I), HIV is able to infect keratinocytes despite lack of CD4 receptors.^{2,3} Present

study was conducted with an aim to study the seroprevalence of HIV in reproductive age group females presenting with genital ulceration.

METHODS

Present study was conducted out in the department of gynecology in collaboration with dermatology and venereology department from January 2019 to February 2020 in a tertiary care centre. A total of 80 female patients within age group 15-45 years presenting with genital ulceration were enrolled in the study. Females unwilling to participate in the study and intravenous drug abusers were excluded from the study. Following written informed consent, a questionnaire was used to record the

patient's name, age, sex, marital status, educational status, occupation, sexual orientation (homosexual, heterosexual or bisexual), number of sexual partners during the previous 6 months, frequency of condom use during the previous 6 months. Patients were also asked about their symptoms, duration of their symptoms and history relevant to appropriate genital symptoms. Details regarding the HIV status whether the patient was on antiretroviral therapy, treatment if any; taken so far for the current genital ulcer disease (GUD), history of systemic illness was elicited. Clinical examination included general physical examination followed by a meticulous examination of the external genitalia and anal region. Various investigations such as tzanck smear, VDRL, gram staining, genital mucosal biopsy, HSV serology and HIV testing were done on study participants.

Protocol for HIV testing

HIV testing was performed by ELISA and tridot test according to the instructions provided in the kits supplied by NACO. Samples positive with ELISA were tested with tridot test. Sera reactive with two tests were taken as positive.

RESULTS

In total, 80 female patients who presented with genital ulceration were included in the study. The mean age of study population was 30.5 ± 23 years. Most of participants (53.75%) belonged to the age group 26-35 years. Married females (42.5%) outnumbered unmarried (23.75%) and widowed subgroup (33.75%) with majority of females belonged to urban areas (66.25%) (Table 1).

Table 1: Demographic profile of study population.

| Demographic profile | No. of female patients | Percentage |
|----------------------------|------------------------|------------|
| Age group (years) | | |
| 15-25 | 11 | 13.75 |
| 26- 35 | 43 | 53.75 |
| 36-45 | 26 | 32.5 |
| Marital status | | |
| Married | 34 | 42.5 |
| Unmarried | 19 | 23.75 |
| Widowed | 27 | 33.75 |
| Occupational status | | |
| House wife | 29 | 36.25 |
| Government employee | 13 | 16.25 |
| Private sector employee | 38 | 47.50 |
| Residence | | |
| Urban | 53 | 66.25 |
| Rural | 27 | 33.75 |

Only 26.25% of the females with genital ulceration gave the history of premarital or extramarital sexual exposure. (Table 2) The most common cause of genital ulceration

was herpes progonitalis (43.75%) followed by Genital warts with secondary ulceration and Lichen Sclerosus et atrophicus (11.25%) (Table 3).

Table 2: Data regarding history of premarital/extramarital sexual exposure in females with genital ulceration.

| Premarital/ extra-marital sexual exposure | Female | |
|---|--------------|------------|
| | No. of cases | Percentage |
| Present | 21 | 26.25 |
| Absent | 59 | 73.75 |

Table 3: Etiology of genital ulcer disease in study population.

| | No. of females | Percentage |
|--|----------------|------------|
| Genital ulcer due to STD | | |
| Herpes progonitalis | 35 | 43.75 |
| Primary chancre | 3 | 3.75 |
| Genital warts with secondary ulceration | 9 | 11.25 |
| Genital ulcer due to non-STD causes | | |
| Fixed drug eruption | 4 | 5 |
| Irritant ulcer | 1 | 1.25 |
| Traumatic ulcer | 2 | 2.5 |
| Genital aphthous ulcer | 16 | 20 |
| Lichen sclerosus et atrophicus | 9 | 11.25 |
| Squamous cell carcinoma | 1 | 1.25 |

Table 4: Clinical diagnosis of genital ulcers in HIV sero reactive patients.

| Diagnosis | No. of cases | Percentage |
|--|--------------|------------|
| Herpes progonitalis | 4 | 50 |
| Primary chancre | 1 | 12.5 |
| Pemphigus vulgaris | 1 | 12.5 |
| Genital aphthous ulcer | 1 | 12.5 |
| Squamous cell carcinoma | 1 | 12.5 |
| Total number of HIV positive patients | 8 | |

Table 5: Marital status of HIV sero reactive cases.

| Marital status | No. of cases | Percentage |
|--|--------------|------------|
| Married | 2 | 25 |
| Unmarried | 3 | 37.5 |
| Widowed | 3 | 37.5 |
| Total number of HIV positive patients | 8 | |

Out of 80 females, 8 patients tested positive for HIV. Most common cause of genital ulceration in HIV positive female patients was herpes progonitalis (50%) followed by others such as chancre, pemphigus vulgaris, genital aphthae, squamous cell carcinoma (Table 4) (Figure 1-3).

Table 6: History of premarital/extramarital sexual exposure and condom use in HIV sero positive patients.

| | No. of cases | Percentage |
|--|--------------|------------|
| Premarital/Extramarital sexual exposure | | |
| Present | 6 | 75% |
| Absent | 2 | 25% |
| Total | 8 | |
| History of condom use | | |
| Present | 3 | 37.5% |
| Absent | 5 | 62.5% |

Only 25% of HIV seropositive females were married rest were widowed or unmarried (Table 5). History of condom use was absent in 62.5% of HIV positive females (Table 6).



Figure 1: Primary chancre as cause of genital ulceration.



Figure 2: Erosions of pemphigus vulgaris in HIV positive female patient with secondary candidal superinfection.



Figure 3: Case of lichen sclerosus et atrophicus with genital warts in HIV positive.

DISCUSSION

India has the third largest HIV epidemic in the world, with 2.1 million people living with HIV.⁴ The current national prevalence is about 0.26% compared with a global average of 0.2%, but the figure in most high-risk groups including female sex workers is much higher (up to 7%).⁵ The Indian epidemic is characterized by low levels in the general population and elevated concentrations among high-risk groups. Kim HN et al illustrated that genital ulcer disease (GUD) increase the HIV seropositivity rate from 2.5% to 52%.⁶ There is substantial evidence that genital ulcer disease enhances transmission and acquisition of HIV infection. Various mechanisms such as increase viral shedding, upregulation of CCR5 receptors in the presence of haemophilus ducreyi, enhanced viral activation in presence of breached mucosal integrity explains the symbiotic relationship between HIV and genital ulcers.² Hence the present study was conducted with an aim to study the seroprevalence of HIV in females presenting with genital ulceration. In a study done by Wand et al women who had recurrent STI diagnoses were 2.5 times more likely to be at increased risk of HIV infection.⁷

In present study most of the females with genital ulceration belonged to the age group of 26-35 years. Similar findings were observed in a study done by Kotagri et al where Maximum patients were in the age group 27-36 years (43%) and minimum in the age group 67-76 years (2%).⁸ This emphasizes the particular vulnerability of this age-group population to STDs Fowole et al on 211 GUD patients peak incidence of

GUD in both cases occurred in 20-29 years age group. In current study only 26.25% of the females with genital ulceration gave the history of premarital or extramarital sexual exposure. This is because there is lot of reservations regarding sexual relations in our society especially in women. They do not wish to be stigmatized for having extramarital/premarital sexual relations and be rejected by the society. In current study only 25% of HIV seropositive females were married rest were widowed or unmarried. This is in contrast to the study done by Kotagiri et al where 85% enrolled subjects were married.⁸

In present study the most common cause of genital ulceration was herpes progenitalis (43.75%) followed by genital warts with secondary ulceration and Lichen Sclerosus et atrophicus (11.25%). Significant VDRL reactivity was shown by only one case of primary chancre and none of the reactive cases were VDRL reactive. This may be due to the fact that due to widespread use of antibiotics incidence of bacterial STDs has declined while that of viral STDs has increased. In a study done by Kotagiri et al genital herpes was the most common STI seen in 34% of the patients followed by genital warts (31%), syphilis (23%).⁸ This is in accordance with study by Devi et al where herpes genitalis (32.8%) was the most common STI in HIV co-infected patients followed by genital warts (17.1%).¹⁰

Krishnamurthy et al in their study chancroid was seen in 22.5% of the patients. This is in contrast with this study where no cases of chancroid were reported.¹¹

In present study, 50% of the females who were HIV seropositive had herpes progenitalis followed by primary chancre. Non-STD causes of genital ulceration such as pemphigus vulgaris, squamous cell carcinoma, genital aphthae accounted for remaining 37.5% of the cases. In study conducted by Chen et al HSV-2 was the most common agent identified in ulcer specimens (35.9%) and was detected in significantly higher proportions of ulcer specimens from HIV infected patients (47.4%).¹² Kumar et al also concluded that genital and perianal herpetic ulcers were common in HIV-infected patients. In this study 3 (75%) HIV reactive cases were from urban areas.¹³ This is because prostitution is more prevalent in urban areas and people may have easy access to prostitutes. Hence, such behaviour increases the risk of acquiring HIV infection.

In present study only 25% of HIV seropositive females were married rest were widowed or unmarried whereas in a study done by Kotagiri et al 80% of the seropositive patients were married.⁸ In this study history of condom use was absent in 62.5% of HIV positive females. This highlighted the importance of protective measure like condom usage in prevention of spread of HIV. Similar findings were reported in a study done by Shewamene et al that females, patients living in rural areas, uneducated groups, and new ART users were less likely to use condoms consistently.¹⁴

CONCLUSION

Despite the small sample size, present study has very aptly highlighted various salient points regarding the seroprevalence and risk factors such as inconsistent condom use, pre-existing genital ulceration, urbanization, extra/premarital affairs promoting the spread of HIV in current scenario. Current study also emphasizes the need to screen for HIV patients presenting with STI complaints and to look for other STIs in HIV positive individuals.

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