Original Research Article

A study of sexually transmitted infections among HIV – infected patients in correlation with their CD4 T cell counts

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Context: Sexually transmitted infections is most common infectious disease for public health. Human immunodeficiency virus (HIV) alters the clinical presentation of sexually transmitted infections, their natural history, relative prevalence and response to treatment.

Aims: To study the sexually transmitted infections and their correlation with the CD4 T cell counts among HIV – infected patients.

Settings and Design: Department of dermatology, venereology and leprology, tertiary care hospital, Cross-sectional study.

Methods and Material: A total of one hundred and fifty-five cases of HIV seropositivity were studied over a period of twelve months. A detailed history covering all relevant points was recorded in all cases. Each patient underwent a thorough general, physical, systemic, dermatological and venereological examination. Twenty-five out of one hundred fifty-five cases had sexually transmitted infections. All relevant investigations were done and data was recorded.

Statistical analysis used: Data analysis was done using Statistical Package for Social Sciences (SPSS) v.21 for windows and Chi-square test was used.

Results: Out of the twenty-five patients, nineteen were males, five females and one transgender. Maximum numbers of patients were between the age group of 31-40 years. Most common sexually transmitted infection was herpes progenitalis (64%). Others were genital warts (16%), balanoposthitis (8%), gonorrhea (4%), syphilis (4%), buschke-lowenstein tumour (4%) and genital molluscum contagiosum (4%).

Conclusions: There is a strong association between the occurrence of HIV and the presence of sexually transmitted infections.

Key Message: Both HIV and sexually transmitted diseases are closely interlinked. So, early diagnosis, treatment and control of sexually transmitted diseases offer a rational approach to the management.

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1. Introduction

The objective of the present study is to find out association of HIV infection with various sexually transmitted infections and correlate with their CD4 T cell counts.

STDs have remained a health issue since many centuries; they became a major health problem worldwide by the appearance of HIV around 1980. The relationship between sexually transmitted infections and HIV is complex. They facilitate transmission of HIV by increasing the infectiousness and susceptibility of the partner.1,2 In turn; HIV infection alters the natural history, manifestations and treatment of sexually transmitted infections.

2. Material and Methods

The present study was cross-sectional study carried out in the Out Patient Department of dermatology, venereology and leprology in tertiary care hospital. A total of one hundred and fifty-five cases of HIV seropositivity were studied over a period of twelve months i.e. February
2013 to January 2014. A detailed history of each case was taken. An attempt was made to know the possible mode of transmission of HIV infection in each patient and/or a history of any risk factor(s) in the spouse. A thorough clinical examination, which included the general examination followed by a detailed dermatological evaluation with emphasis on sexually transmitted infections, was done and findings were recorded. The clinical diagnosis of genital lesions was supplemented with relevant laboratory investigations such as gram staining, 10% KOH mount under the microscope, Tzanck smear, venereal disease research laboratory test (VDRL), skin biopsy in selected cases. Patients were treated according to diagnosis made. Specific treatment was given for sexually transmitted infections. Cases were asked to come for follow-up every week initially, and monthly after clinical cure.

Data analysis was done using Statistical Package for Social Sciences (SPSS) v.21 for windows. For comparison of frequencies and percentages Pearson Chi-square test was used. For comparison of more than two groups Krushal Wallis test was used. P value <0.05 was considered statistically significant.

3. Results

One hundred and fifty-five cases were observed over a period of one year. Twenty-five cases (16.12%) had sexually transmitted infections (n = 25, one patient had both herpes progenitalis and genital warts). Out of these nineteen (76%) were males, five (20%) were females and one (4%) transgender. Maximum cases (48%) were in the age group of 31-40 years. A total of sixteen (64%) patients were married, six (24%) unmarried, two (8%) were separated and one (4%) widowed. Most common route of transmission was found to be heterosexual (76%) [Table 1] and most common infection was herpes progenitalis (64%) [Figure. 1] with a mean CD4 T cell count of 289.81 cells/cumm, [Table-2]

4. Discussion

In the present study, males comprised of 76% whereas females comprised of 20% of the patients with 4% being transgender. This was similar to a study done by Agrawal et al. which had 72.1% males and 27.9% females. The highest incidence of HIV positive patients is in the age group of 21-40 years (65.16%) which highlights the fact that it is most common in sexually active age group which makes them most vulnerable similar results were reported in other studies. Maximum patients were from a rural background and mainly were illiterate. This causes lack of awareness about the safe sexual practices, making them more prone to develop sexually transmitted infections and HIV. 64% patients were married which signifies the polygamous relationship in these patients making them more vulnerable. Heterosexual (76%) was the most common mode of transmission which was similar to that seen in Kamat et al. study (67.7%).

The most common type of Sexually Transmitted infection in the present study was Herpes progenitalis with a mean CD4 T cell count of 289.81 cells/cumm which was almost similar to 239.00 cells/cumm in a study done by Vasudevan et. al. and higher than 198 cells/cumm in Shobhana et al. study, similar results were reported in other studies. It was the most common STD found in all the related studies except Nair et. al. study where syphilis
### Table 1: Distribution of study population according to Route of Transmission of HIV infection.

| Route              | N (25) | Percentage |
|--------------------|--------|------------|
| Heterosexual       | 19     | 76%        |
| Homosexual         | 2      | 8%         |
| Bisexual           | 1      | 4%         |
| Blood transfusion  | 3      | 12%        |

### Table 2: Sexually Transmitted Diseases (STDs) and their CD4 counts in the study subjects.

| Sexually Transmitted Diseases | n  | MeanCD4 Count (cells/mm\(^3\)) | Kruskal Wallis test value | P-Value |
|------------------------------|----|---------------------------------|--------------------------|---------|
| Herpes Progenitalis          | 16 | 289.81                          | 12.317                   | 0.043   |
| Balanoposthitis              | 02 | 372.50                          |                          |         |
| Buschke Lowenstein Tumour    | 01 | 351.00                          |                          |         |
| Genital warts                | 04 | 295.25                          |                          |         |
| Gonorrhoea                   | 01 | 719.00                          |                          |         |
| Syphilis                     | 01 | 795.00                          |                          |         |
| MolluscumContagiosum (genital)| 01 | 591.00                          |                          |         |

was the commonest STD. One case of Syphilis was seen in the present study with CD4 T cell count of 295 cells/cumm which was much higher than the CD4 T cell count seen in Vasudevan et al. (157 cells/cumm) and Shobhana et. al. (54 cells/cumm). \(^{11,12}\) One case of Gonorrhoea was also seen with CD4 T cell count of 719 cells/cumm. Both these infections accounted for 4% of the total cases in the present study which was higher than 2.47% gonorrhoea cases in Nair et al. and 2% syphilis cases in Shobhana et al. \(^{6,7}\) Genital warts were also seen in the present study with the mean CD4 T cell count of 295.25 cells/cumm which was much higher than 152 cells/cumm in study of Shobhana et al. and Bosamiya et al. \(^{12,17}\) Percentage of Genital warts in the present study (16%) was much higher than that seen in Nair et al. (6.16%) and Shobhana et al. (5%). \(^{12,18}\) Special mention about one case of buschke-lowenstein tumour needs to be done with the CD4 T cell count of 351 cells/cumm [figure2]. A wide surgical excision of the tumour was done and 80% of the tumour was removed. The rest 20% was treated with 20% topical podophyllin. 4% cases of Genital molluscum were seen in the present study which was higher than 0.5% seen in Shobhana et. Al and Martin et al. \(^{12}\) The mean CD4 T cell count was 591.00 cells/cumm. 8% of Balanoposthitis was also present in the present study which was quite higher than 2% seen in Shobhana et. Al who reported mean CD4 T cell count of 372.50 cells/cumm. \(^{12}\) Similar result was reported in other studies. \(^{20-22}\)

### 5. Conclusion

HIV-related sexually transmitted infections are quite common and present according to the degree of immunosuppression. They can be easily detected if studied properly and can also serve as diagnostic and prognostic markers. The present study also highlights the need for modest interventions - moral and health education to prevent HIV infection and sexually transmitted infections in younger age group.

### 6. Source of Funding

None.

### 7. Conflict of Interest

None.

### References

1. Cohen MS. Sexually transmitted diseases enhance HIV transmission: a hypothesis no longer. \(\textit{Lancet}\). 1998;351(III):5–7.
2. Wasserheit JN. Epidemiological synergy: interrelationships between human immune-deficiency virus infection and other sexually transmitted diseases. \(\textit{Sex Transm Dis}\). 1992;19:61–77.
3. Aggarwal A, Arora U. HIV seropositivity among patients with sexually transmitted diseases. \(\textit{Indian J Dermatol Venereol Leprol}\). 2003;69:23–4.
4. Jindal N, Aggarwal A, Kaur S. HIV seroprevalence and HIV associated dermatoses among patients presenting with skin and mucocutaneous disorders. \(\textit{Indian J Dermatol, Venereol Leprol}\). 2009;75(3):283–6.
5. Chopra S, Arora U. Skin and Mucocutaneous Manifestations: Useful Clinical Predictors of HIV/AIDS. \(\textit{JCRD}\). 2012;6:1695–8.
6. Shenoy C. To study the clinical and epidemiological Profile of cutaneous manifestations in patients With human immunodeficiency virus infection And its correlation with CD4 counts. \(\textit{Dissertation; RGUHS}\). 2012.
7. Sen S, Halder S, Mandal S, Pal PP, Halder A, Bhaumik P et al. Clinico-epidemiological profile of cutaneous manifestations among human immunodeficiency virus positive patients in the sub-Himalayan region. \(\textit{Indian J Dermatol Venereol Leprol}\). 2009;75:403–5.
8. Zancanaro P, Laura Y, Mamelak A, Nguyen RH, Martins C. Cutaneous manifestations of HIV in the era of highly active antiretroviral therapy: An institutional urban clinic experience. \(\textit{J Am Acad Dermatol}\).
260

Agrawal, Sharma and Saxena / IP Indian Journal of Clinical and Experimental Dermatology 2020;6(3):257–260

2006;54:581–8.
9. Banerjee S, Pal PR, Halder S, Halder A. Skin diseases in HIV-infected patients: Impact of immune status and histological correlation. Indian J Sex Transm Dis AIDS. 2012;33(1):65.
10. Kamat HA, Banker DD. Human immunodeficiency virus-l infection among patients with sexually transmitted diseases in Bombay. Natl Med J India. 1993;6:11–3.
11. Vasudevan B, Sagar A, Bahal A, Mohanty AP. Cutaneous manifestations of HIV—a detailed study of morphological variants, markers of advanced disease, and the changing spectrum. Med J Armed Forces India. 2012;68(1):20–7.
12. Shobhana A, Guha SK, Neogi DK. Mucocutaneous manifestations of HIV infection. Indian J Dermatol Venereol Leprol. 2004;70:82–6.
13. Attili V, Singh VP, Sundar S, Gulati AK, Varmadv, Rai M, et al. Relationship Between Skin Diseases and CD4 Cell Counts in a Hospital-based Cohort of HIV-infected Adults in North India. J. Indian Acad Clin Med. 2008;9(1):20–5.
14. MUNoz-Perez MA, Pichardo RA, Camacho F, Colmenero MA. Dermatological findings correlated with CD4 lymphocyte counts in a prospective 3 year study of 1161 patients with human immunodeficiency virus disease predominantly acquired through intravenous drug abuse. Br J Dermatol. 1998;139(1):33–9.
15. Raju PVK, Rao GR, Ramani TV. Skin disease: clinical indicator of immune status in human immunodeficiency virus (HIV) infection. Int J Dermatol. 2005;44(8):646–9.
16. Fernandez MS. Mucocutaneous manifestations of HIV infection in correlation with CD4 T cell count. Dissertation, RGUHS,Bangalore; 2010.
17. Sanjay S. Dermatological manifestations of human immunodeficiency virus/acquired immunodeficiency syndrome in era of highly active antiretroviral therapy. 1992;35:73–5.
18. Nair SP, Moorthy KP, Suprakasan S. Clinico-epidemiological study of HIV patients in Trivandrum. Indian J Dermatol Venereol Leprol. 2003;69:100–103.
19. Martin JM, Molina I, Monteagudo C, Marti N, Lopez V, Jorda E, et al. Buschke-Lowenstein tumor. J Dermatol Case Rep. 2008;2(4):60–2.
20. Sharma S, Puri K, Gambhir M. Male preponderance in HIV seropositive patients with mucocutaneous complaints in a tertiary care hospital in North India. Asian Pacific J Trop Biomed. 2014;4(1):S186–8.
21. Marfatia YS, Sharma A, Chaudhary D, Modi M, Mistry D. Noninfectious cutaneous manifestations of HIV/AIDS. Indian J Sex Transm Dis AIDS. 2007;28(1):19–22.
22. Shelburne SA, Montes M, Hamill RJ. Immune reconstitution inflammatory syndrome: more answers, more questions. J Antimicrob Chemother. 2006;57(2):167–70.

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