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Original Article

Seroprevalence of Human Immunodeficiency Virus/Hepatitis B Virus/Hepatitis C Virus Infections and Syphilis among Sexually Transmitted Infection Patients - A Prospective Study

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Abstract

Background: Human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) infection are found to be a global health problem. Many risk behaviors as well as the routes of transmission for HBV and HCV infections are identical to those of HIV and other sexually transmitted diseases.

Aim: To study the seroprevalence of HIV, HBV, HCV infections and syphilis and to assess the risk of these coinfections in patients with sexually transmitted infections (STI).

Materials and Methods: STI patient's detailed history was taken along with risk assessment. Blood samples were collected and subjected to HIV Rapid Method, venereal disease research laboratory test which if reactive followed by treponema pallidum haemagglutination test, hepatitis B surface antigen, and anti-HCV antibody by enzyme-linked immunosorbent assay.

Results: Among the 3044 patients, 125 were HIV positive (4.1%) (male = 80, female = 43, and transgender [TG] = 2). Coinfection with HBV, HCV, and syphilis was seen in 30 HIV positives (24%). The coinfection combinations were as follows: HIV + HBV 12 (9.6%), HIV + HCV 9 (7.2%), HIV + syphilis 6 (4.8%), and HIV + HBV + HCV 3 (2.4%). None had HIV/HBV/HCV/syphilis coinfection combination. The incidence of HIV + HBV was higher in the study population. The affected age group was 25-44 years. Both two HIV-positive TG had coinfections. Most of the patients with the coinfections also had other STI's like warts, herpes, candidiasis, gonorrhoea, trichomoniasis, and bacterial vaginosis.

Conclusion: The prevalence of HIV, HBV, HCV, and syphilis coinfections needs to be studied on a larger scale for better understanding of their impact on clinical outcome, to assess the magnitude of these coinfections; the role of sexual transmission, associated risk factors in the STI population; treatment response; to create awareness, and to prevent morbidity and mortality caused by these infections.

Key words: Coinfections, Hepatitis B virus, Hepatitis C virus, Human immunodeficiency virus/Acquired immune deficiency syndrome, Sexually transmitted diseases

BACKGROUND

Infections caused by human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) and Treponema pallidum remain the most important health problems worldwide.[1,2] Among the blood-borne viruses transmissible through blood transfusion, parenteral route as well as by sexual route, HIV, HBV, and HCV have many implications.[3] They not only cause asymptomatic persistent infections but also cause significant mortality and morbidity. Many risk behaviors as well as the routes of transmission for HBV and HCV infection are similar to those for HIV and other sexually transmitted diseases (STDs) such as syphilis, genital warts, etc. Sexual activity plays a prominent role in the transmission of these infectious agents in our community. HIV infection

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increases HBV and HCV replication and accelerates progression of HBV and HCV infections and also Syphilis due to immunosuppression associated with HIV infection. Sexually transmitted infections (STI) induced immunosuppression also leads to increased susceptibility of HIV infection.

Aim

To study the seroprevalence of HIV, HBV, HCV infections and Syphilis and to assess the risk of these coinfections in STI patients.

MATERIALS AND METHODS

This prospective observation study was conducted in Department of Venereology, Madras Medical College, Chennai, Tamil Nadu, India. All patients were interviewed at outpatient in privacy and confidential manner. A structural questionnaire was administered to the patient after getting signed consent. The questionnaire includes questions related to demographic characters, sexual behaviors, and history of previous STI. In sexual history, the patients were asked about homosexual, bisexual behavior, sexual practice, premarital, extramarital contact, and condom usage. History of presenting complaints, past STIs', and their treatment were recorded. Another history such as the history of any previous surgery, blood transfusion, and intravenous drug abuse was noted. Physical and genital examination was done to find out any genital or extragenital evidence of STIs. The STIs' in these patients were diagnosed with clinical findings and relevant laboratory investigations. Blood samples are collected for performance of the serological tests, which includes HIV Rapid Method, venereal disease research laboratory test which if reactive followed by treponema pallidum Haemagglutination test, hepatitis B surface antigen, and anti-HCV antibody by 3rd generation enzyme-linked immunosorbent assay.

RESULTS

In our study, 3044 patients were included. Among 3044 patients, HIV positives were 125 (4.1%) (male = 80, female =43, and transgender [TG] = 2) as shown in Figure 1. Coinfection with HBV, HCV, and Syphilis was seen in 30 HIV positives (24%). Among 30 HIV-positive patients, 18 males, 10 females, and 2 TG were coinfected with HBV, HCV, and Syphilis) (Table 1). Table 2 shows most commonly affected age group with these coinfections was between 25 and 44 years.

Most of the patients with the coinfections also had other STIs' such as warts, herpes, bacterial vaginosis, trichomoniasis, candidiasis, gonorrhoea, and balanoposthitis. Among 12 patients with HBV and HIV coinfection, 6 (50%) had other STI's (Table 3). None had HIV/HBV/HCV/Syphilis coinfection combination.

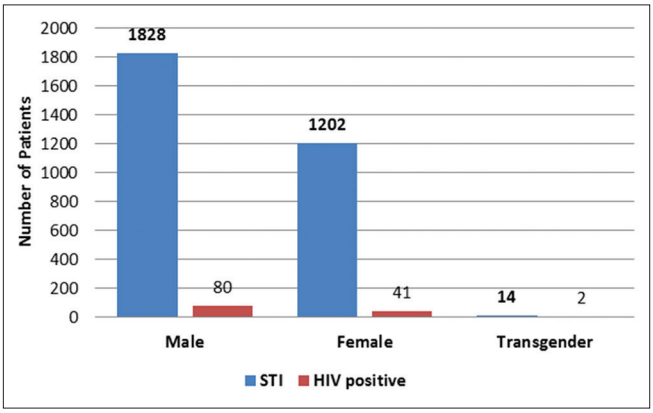

Figure 1: Distribution of sexually transmitted infections patients and human immunodeficiency virus-positive patients

Table 1: Distribution of coinfections in HIV-positive patients

Coinfections combination	Male	Female	TG	Percentage
HIV+HBV	6	5	1	9.60
HIV+HCV	5	4	0	7.20
HIV+Syphilis	5	1	0	4.80
HIV+HBV+HCV	2	0	1	2.40

HIV: Human immunodeficiency virus, HBV: Hepatitis B virus, HCV: Hepatitis C virus, TG: Transgender

Table 2: Distribution of coinfections in age group

Coinfections combination	Age group		
	21-24	25-44	>44
HIV+HBV	0	11	1
HIV+HCV	0	8	1
HIV+Syphilis	1	4	1
HIV+HBV+HCV	1	2	0

HIV: Human immunodeficiency virus, HBV: Hepatitis B virus, HCV: Hepatitis C virus

Table 3: Distribution of co-infections with other STI's

STI	HIV+HBV	HIV+HCV	HIV+HBV+HCV
Herpes	1	0	0
Warts	1	0	0
BV/TVV	1	0	1
Candidiasis	1	1	1
Balanoposthitis	1	0	0
Herpes/wart	1	0	0
Herpes/wart/MC	0	1	0
Gonorrhoea	0	0	1

HIV: Human immunodeficiency virus, HBV: Hepatitis B virus, HCV: Hepatitis C virus, STI: Sexually transmitted infections, BV: Bacterial vaginosis, TVV: Trichomaonal vulvovaginitis, MC: Molluscum contagiosum

DISCUSSION

The affected age group was mostly between 25 and 44 years which was similar to Hussain *et al.* study.[4] Males were predominant than females and TG in our study. Among 125 HIV patients, only 30 (24%) patients had coinfections. Although the percentage of patients with coinfections is lower, the combination of these infections such as HIV, HBV, and HCV is a dangerous coexistence.[5,6] In our study, seroprevalence of HBV in HIV-infected patients was higher (9.6%) which was similar to the study of Sawant *et al.* in Mumbai.[7] HIV and HCV coinfection were around 7.2% which was higher in our study compared to 1.6% in Lucknow[8] and 2.3% in Chennai.[9] The HCV coinfection from Nagpur[10] was reported as 7.2% similar to the present study. Among the 14 TG, two were HIV positive and both had coinfections, one with HBV infection and the other with HBV and HCV infections in our study. Most of the patients with the coinfections also had other STIs' such as warts, herpes, bacterial vaginosis, trichomoniasis, candidiasis, gonorrhoea, and balanoposthitis.

CONCLUSION

The presence of STI's in an individual signifies his/her sexual behavior and enhances the chance for the transmission of HIV/other infections such as HBV/HCV. The increased risk of HBV, HCV, and HIV infection among STD patients warrants specific preventive action.[11] Focus is needed on the prevention of HIV infection in the STI population and screening the high-risk population for these infections would aid in prompt diagnosis and treatment which may decrease the further spread of these viral infections. Vaccination against HBV should be done among high-risk groups with hepatitis B and also in the general population to decrease the prevalence of HBV infection.

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