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Research Article

A study on the association between HSV-2 and HIV serostatus in HIV seropositive and HIV seronegative individuals

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ABSTRACT

Background: HSV-2 is a common cause of genital ulcer disease worldwide and has become a prominent public health issue over recent years. The major public health importance of HSV-2 relates to its potential role in facilitating HIV transmission. This study was done to know the association of HSV-2 and HIV, to compare the seropositivity of HSV-2 in HIV seropositive and HIV seronegative individuals and also to study the influence of certain factors on HSV-2 infection.
Methods: Blood samples collected from 132 HIV seropositive individuals and 50 HIV seronegative blood donors were screened for HSV-2 type specific IgG antibodies by ELISA.
Results: 84 samples of the test group tested positive for HSV-2 (63.63%), which is significantly higher compared to 3 (6%) positives of the control group. HSV-2 seropositivity was significantly higher in individuals with multiple sexual partners, illiterates, daily wage workers.
Conclusions: High seropositivity of HSV-2 in HIV seropositive individuals demonstrates the need for regular screening of HSV-2 in HIV seropositive individuals. It also clearly shows that education and occupation will influence the prevalence of HIV and HSV-2.

Keywords: HSV-2, HIV, ELISA, Seropositivity

INTRODUCTION

Herpes virus infections are worldwide in distribution.[1] Humans are the only natural host and latent virus in trigeminal and sacral ganglia is the reservoir. The source of transmitted virus is by contact with infected secretions, that is either oral or genital secretions.[2] HSV-1 more frequently associated with non-genital infection (infection above the belt), whereas HSV2 associated with genital disease (infection below the belt). Data have indicated that the incidence of genital herpes increased approximately 20 folds in the world during the last 2 decades.[3] Herpes Simplex Virus type-2 (HSV-2) infection is a growing worldwide problem with high prevalence in developing countries, especially those with Human Immunodeficiency (HIV) infection, where incidence of reactivation is high.[4]

Of all the sexually transmitted diseases, there appears to be true epidemiologic synergy between these two viruses. The earliest reports of interactions between HSV-2 and HIV infections were from the 1980s.[5] Interactions of both viruses occur on epidemiologic, clinical and cellular levels.[6] Studies have shown that genital HSV infections significantly increase the risk of acquisition and transmission of Human Immunodeficiency Virus (HIV),

because the ulcerative lesions are openings in the mucosal surface.[7] It is associated with 2 to 4 fold increased risk of HIV-1 acquisition.[8] HIV-1 infection also appears to be fueling the HSV-2 epidemic. HSV is a common opportunistic pathogen in HIV infected person. HSV reactivation appears to upregulate HIV replication. HSV-2/HIV-1 coinfected persons have HIV-1 RNA titers that are a half log higher than HSV-2 seronegative HIV-1 seropositive persons, data also suggest that these individuals may transmit HIV-1 infection more frequently than HIV-1 seropositive persons who are HSV-2 seronegative.[8] Studies suggest that acyclovir therapy appears to decline plasma HIV RNA.[6] HIV-1 infection changes the natural history of HSV-2 infection and HSV infection may alter the course of HIV-1 disease. The burden of HSV-2 has implications regarding the transmission and infectiousness of HIV. Therefore the effectiveness of any programme to prevent HIV-1 transmission is affected by HSV-2 prevalence. These data show that greater attention to the diagnosis and treatment of HSV-2 among HIV-1 infected persons is warranted especially those who continue to be sexually active, those not on antiretroviral, or those whose disease is not well suppressed by antiretrovirals.[8]

HSV-2 infection is life long, and serological testing provides the best method to estimate HSV-2 seropositivity.[9]

Aim and objectives

To study the association of HSV-2 and HIV infection ,to compare the seropositivity of HSV-2 in HIV seropositive and HIV seronegative individuals and the influence of various factors like age, sex, occupation, educational status, marital status, number of sexual partners on the HSV-2 infection.

METHODS

This is a prospective study conducted at Department of Microbiology, Government General Hospital, Kakinada. Study group constituted 132 HIV seropositive individuals attending VCTC and control group included 50 voluntary blood donors attending the blood bank, Government General Hospital, Kakinada, screened and tested negative for anti HIV antibodies. Various factors like age, sex, occupation, literacy, marital status, number of sexual partners, rural/urban were considered during the study.

Collection of specimens and storage

5 ml of venous blood was collected using disposable syringes under sterile conditions. Serum separated and transferred into sterile provials. These samples were tested according to NACO guidelines and seropositivity of HIV confirmed. All the positive serum samples were preserved at -20 degree centigrade and screened for HSV-2 type specific IgG antibodies by ELISA by EUROIMMUN Anti HSV-2 ELISA IgG kit.

RESULTS

During the study period 182 serum samples were screened for HSV-2 type specific IgG antibodies by ELISA. Of the samples tested 132 were HIV seropositive and 50 HIV seronegative. Individuals of age groups 20 to 60 years were included in the study group. Out of 132 HIV seropositive samples, 74 were males and 58 were females. 57 were of age group 21-30 years, followed by 50 individuals of 31-40 years, 15 of 41-50 years and 10 of 51-60 years. 94 of them were from rural area and 38 from urban population. 101 were married, 27 were widowed/divorced and 4 were unmarried. 63 had multiple sexual partners and 69 had single partner. The seropositivity of the HSV-2 is shown in the Table 1.

Table 1: Herpes simplex virus-2 seropositivity in the test (HIV seropositive) and control group (HIV seronegative) voluntary blood donors.

Group	No. of samples tested	No. of positives	Percentage of positives
Test	132	84	63.63
Control	50	03	6

In the study group, 46 (62.16 %) of males and 38 (65.51%) of females were HSV-2 seropositive. 51-60 years age group showed a higher percentage of HSV-2 seropositivity (80%), followed by 31-40 years (76%), followed by 21-30 years (54.38%) and 41-50 years (41.66%) age group. Seropositivity of HSV-2 in the test group is more in widowed/divorced (85.18%) than married (58.41%) and unmarried (50%). Seropositivity of HSV-2 was more among individuals having multiple sexual partners (77.77%) than with single partner (50.72%). Positivity of HSV-2 was highest among daily wage workers (69.62%), followed by housewives (62.06%), drivers (50%), employees (50%), businessmen (42.85%) and students (33.33%). HSV-2 seropositivity among rural population was 59 (62.76%) and that among urban individuals was 25 (65.78%). Seropositivity of HSV-2 in relation to literacy has been shown in Figure 1.

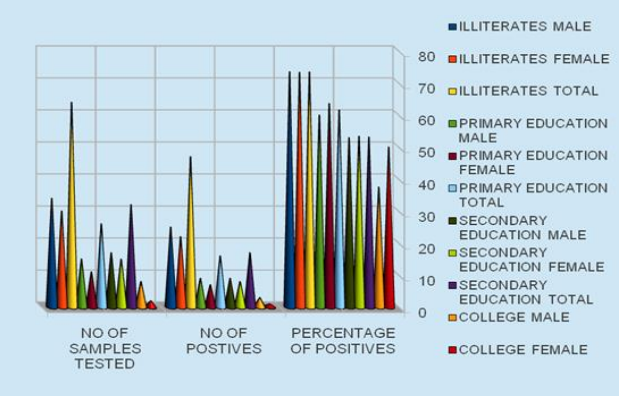

Figure 1: HSV-2 seropositive in relation to literacy in test group.

DISCUSSION

Genital Herpes virus infections are now one of the commonest sexually transmitted diseases. The incidence of HSV-2 has increased manifold in the last two decades and has assumed major public health significance especially because of its association with HIV infection. Coinfection of HSV and Human Immunodeficiency Virus (HIV) frequently occurs, probably because they potentiate each other's transmission. The seropositivity of HSV-2 in the present study 63.63% is similar to Laurent Andreoletti et al.[10] In our study, control group showed 6% seropositivity for HSV 2, which is comparable with studies conducted by Rode OD et al.[11] Our study showed 65.51% female positivity slightly higher than that in males 62.16%, coinciding with the Laurent Andreoletti et al.[10] 51-60 years age group showed a higher percentage of HSV-2 seropositivity 80%, which is similar to Mbizvo EM, et al.[12] and Rode OD et al. [11] Our study showed that as the age advances, seropositivity of HSV-2 increases. Seropositivity of HSV-2 in the test group is more in widowed/divorced group 85.18%, this indicate that these individuals are forced to have sexual promiscuity due to socioeconomical conditions. Our study showed HSV-2 seropositivity more among multiple sexual partners 77.77% which is similar to K. Anuradha et al.[13] This finding reveals multiple sex partners as a risk factor for acquisition of HSV-2 and HIV. The seropositivity of HSV-2 was more among daily wage workers 69.62%. Poverty and illiteracy could be the reason for this high seropositivity. HSV-2 seropositivity was highest among illiterates 73.43% and the frequency gradually reducing as the educational status raising, indicating the importance of education in the prevention and control of these diseases.

ELISA to detect type specific IgG antibodies to HSV-2 is rapid, least expensive and has sensitivity and specificity ranging from 91 to 100%, with minimal cross reactional activity. So HSV type specific serological testing in HIV population could be an efficient strategy to diagnose clinically asymptomatic HSV-2 infection and therefore to reduce the risk of HSV-2 and HIV sexual transmission by convenient and prophylactic counseling.

CONCLUSION

The high HSV-2 seropositivity in HIV patients indicates the need for regular HSV-2 screening in all HIV positive patients. Study showed that the educational status and occupation influence the prevalence of HIV and HSV-2, so these should be improved to decrease the occurrence of these dreaded diseases. Early detection, treatment, counseling and health education of genital herpes cases will play an important role in controlling the epidemic of HIV. HSV suppression with acyclovir/valacyclovir indirectly lowers the HIV viral load. These relationships may have implications for HIV control efforts, and intervening in these virus-virus interactions may modulate the progression of HIV infection.

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