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STUDY OF SEROPREVALENCE OF HSV-2 AMONG HIV SEROPOSITIVE INDIVIDUALS AT S.V.R.R.G.G.H TIRUPATI

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Abstract: BACKGROUND: Genital ulcerative disease is one of the risk factor for acquisition of HIV. As HSV-2 infection is currently the most common cause of genital ulcerative disease, it acts as a potential risk factor for HIV infection. The present study was under taken to know the seroprevalence of antibodies to HSV-2 in HIV seropositive individuals and in general population, and to ascertain if HSV-2 is a risk factor for developing HIV infection. **METHODS:** The study group included one hundred and thirty two new HIV seropositive persons irrespective of active genital herpes or history of genital herpes. Fifty age and sex matched healthy voluntary blood donors' were included as controls. In all patients and controls, diagnostic serology was done for HSV-2 using HSV-2 specific glycoprotein IgG2 by indirect immunoassay using the ELISA test. Statistical value 'P' was calculated using the Chi-squared test. **RESULTS:** Out of the 132 HIV seropositives, 76 were males and 56 were females with an age range of 20 to 50 years. In only 32 (25 males and 7 females) of these, positive history of genital herpes was obtained. In 100 out of the 132 HIV seropositives, IgG2 antibodies against HSV-2 were detected. In control group, 10 out of 50 controls were seropositive for HSV-2 IgG2 antibody. There was a statistically significant association between HSV-2 and HIV seropositivity with 'P' value < 0.005. **CONCLUSION:** The high prevalence of HSV-2 seropositivity in HIV infected group (75.8%) as compared to normal (20%) was statistically significant. Prior HSV-2 infection could be an important risk factor for acquisition of HIV in our patients

Keywords: Human immunodeficiency virus, Herpes simplex virus 2, Seroprevalence.



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INTRODUCTION

Genital ulcerative disease is one of the risk factor for acquisition of human immunodeficiency virus (HIV) infection because of the disruption epithelial barrier and infiltration by CD4 + lymphocytes which are targets for HIV infection. In the recent decades, the prevalence of Herpes simplex infection is on the rise and herpes simplex virus 2 (HSV-2) infections is currently the most common cause of genital ulcerative disease. Hence, HSV-2 may act as a potential risk factor for the acquisition of HIV infection.

Till now, very few studies have been carried out in Asia to compare the seroprevalence of HSV-2 in HIV positive individuals with that in general population. The present study was under taken to know the seroprevalence of HSV-2 in HIV positive individuals and the general population in and around Tirupati and to ascertain if HSV-2 is a risk factor for HIV infection.

METHODS

This study was conducted in Department of Microbiology, S.V Medical College Tirupati between March and august 2008. The study group included one hundred and thirty two newly detected cases seropositive for HIV infection, both symptomatic and asymptomatic, irrespective of active genital herpes or history of genital herpes. The HIV status of all the patients was established with ELISA test done as per the NACO guidelines. Patients already on antiretroviral therapy (ART) were excluded. Fifty age and sex matched healthy volunteers were included as controls. In all cases, a thorough history was taken including demographic data, age and sex of the patient, occupation, marital status and number of sexual partners, and past history of any sexually transmitted infection. History of genital herpes and number of such attacks were recorded.

Five ml of blood was collected from all patients and controls, and diagnostic serology was done for HSV-2 using HSV-2 specific glycoprotein IgG2 by indirect immunoassay using ELISA (using EUOIMMUN, enzyme immunoassay kit of herpes simplex type 2 (HSV-2IgG)). The EUROIMMUN kit ELISA test specifically detects IgG class antibodies directed against HSV-2 glycoproteinG2. Cross reactivity with antibodies against HSV-1 leading to false positive results does not occur with ELISA. The test done with this kit, as compared to the western blot for HSV-2, is 98% specific and 100% sensitive. Statistical value 'P' was calculated using the Chi-square test to know the significance of association between HSV-2 and HIV in the case and control group.

RESULTS

Out of 132 cases 76 were males and 56 were females. The age of cases varied from 20 to 50 years with a mean age of 30.5 years. Out of 76 males 50 were married and 26 were unmarried. History of exposure to multiple partners was obtained from all the males. Thirty two cases (28 males and 4 females) gave a positive history of genital herpes. Out of these 32 cases 5 males

had active genital lesion at time of examination. In the control group, there were 47 males and 3 females with mean age of 25.5. Only in 2 cases, positive history was obtained and active disease was not seen in any of these cases. In all the cases and controls there was no evidence of any other active STI.

In the HIV seropositive group, 100 out of 132 cases (75.8%) were seropositive for HSV2-IgG antibodies, of which 59 were males and 41 were females. In control group 10 out of 50 control (21.2%) were seropositive for HSV-2 IgG antibody and out of these 10 were males and 0 were females. The prevalence of HSV-2 seropositivity was higher HIV seropositive females, 41 out of 56 (73.2%) when compared to males, 59 out of 76 cases (77.6%).

Herpes simplex virus-2 sero positivity in cases and controls

Hsv Seropositivity in cases:

	Positive	Negative	Total
Male	59	17	76
Female	41	15	56
Total	100	32	132

Hsv2 Seropositivity in controls:

	Positive	Negative	Total
Male	10	37	47
Female	0	3	3
Total	10	47	57

Age distribution of Herpes simplex-2 seropositivity in cases and controls

Seropositivity in Cases:

Age Groups(Years)	Positive	Total
20-30	47	63
31-40	37	46
41-50	16	23
Total	100	132

Seropositivity in controls:

Age Groups(Years)	Positive	Total
20-30	7	33
31-40	1	12
41-50	2	5
Total	10	50

The prevalence of seropositivity for HSV-2 increased with increasing age in both HIV- positive cases and controls. It was 74.6%, 80.4%, 29%and 40% in 20-30, 31-40, 41-50 age groups, respectively. The age group 31-40 had highest number of HSV-2 seropositives in both the cases and controls. There was a statistically significant association between HSV-2 seropositivity and HIV seropositivity ($\chi^2= 8.19$ $P<0.005$).

DISCUSSION

Genital ulcerative disease is a potential risk factor for acquiring HIV infection. Several studies have revealed that genital herpes is currently the most common genital ulcerative disease. More recently, several groups have reported that serological evidence of herpes simplex virus type 2 infections is associated with increased HIV-1 infection.

Asymptomatic shedders can transmit infection and thus are important epidemiologically 70% of cases. The risk of shedding increases in individuals with recently acquired HSV-2 (within one year) and in individuals with frequent symptomatic recurrences.

In our study, out of 50 controls history of genital herpes was obtained only in 2 cases, though seropositivity was observed in 10 cases. Similarly in the HIV- seropositive group out of 132 cases, history of genital herpes obtained in 32 and active genital lesions were seen in 5 cases though seropositivity was observed in 100 cases. These observations reveal that serological examination is an accurate tool to know the prevalence of HSV-2 in general population, particularly in asymptomatic carriers.

The present study showed that the seroprevalence of HSV-2 in the general population in our area is around 73.6%. This observation is almost similar to the observations of Gwanzura L (1998) and Francois-Xavier et al (2000) who reported the seroprevalence of HSV-2 infection in the general population of Zimbabwe and Africa to be 82.7%and 82% respectively. Some other previous studies have reported a higher seroprevalence of HSV-2.

In the present study 132 HIV positive cases, only the heterosexual mode of transmission of HSV and HIV was noted. None of the patients gave any history of homosexual exposure. Similar

sexual behaviour was observed in the control group, highlighting the sexual behaviour pattern of the population in this region. This establishes that heterosexual mode is the main route of transmission of HSV/HIV in this area.

The observation of 75.8% seropositivity for HSV-2 in HIV- positive individuals is in correlation with previous studies. A very high HSV-2 seropositivity in HIV infected individuals was observed in North America and Africa.

It was observed in the present study that the seropositivity for HSV-2 in HIV cases is slightly higher in males (77.6%) than in females (73.2%). This shows that men are more vulnerable for acquisition of HSV and HIV than women. The present study also showed that the percentage of seropositivity for HSV-2 increased with increasing age of the individuals tested. The age group of 31-40 had the highest number of HIV and HSV-2 seropositives and also the highest number of HSV-2 serpositives among controls. Similar observations were made in earlier studies. These findings reveal that this is the most vulnerable age group for acquiring these two diseases. Statistical analysis showed that there is a statistically significant association between HSV-2 and HIV infection ($\chi^2= 8.19$, $P<0.005$), which is in accordance with previous studies. This once again establishes the role of HSV-2 in acquiring HIV infection.

CONCLUSION

The seroprevalence of HSV-2 may act as one of the contributing factors for HIV acquisition among hetero sexual. Unlike patients with other genital ulcerative diseases, those who have had genital herpes are often unaware of prior infection, serological evidence a more accurate predictor of prior genital herpes. These asymptomatic seropositive patients, who continue to engage in unprotected sexual activities, may be responsible for increased transmission of both HSV-2 and HIV to uninfected partners. Genital herpes infections are the commonest cause of disruption of epithelial barrier and infiltration of CD4 cells locally in the genital mucosa. Thus, these infections act as a major risk factor for acquisition of HIV. Early detection, treatment, counselling and health education of genital herpes cases would play an important role in controlling the dreaded epidemic of HIV.

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