

Seroepidemiological study of Herpes simplex virus 2 in Human Immunodeficiency Virus -1 seropositive individuals attending integrated counseling and testing centre in a tertiary care hospital in Warangal

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ABSTRACT

Introduction: Herpes simplex virus type 2 (HSV2) transmitted via sexual route is now the most common cause of genital ulcers in developed and developing countries. Increasing evidence demonstrates a substantial link between the epidemics of sexually transmitted HIV1 and HSV2 infection. HSV2 has an important role in acquiring and transmitting HIV through genital ulcers.

Aims & objective: This study was conducted to determine the seroprevalence of HSV2 in HIV seropositive individuals attending ICTC in a tertiary care hospital in Warangal and to study the sociodemographic factors influencing HSV2 seroprevalence in HIV seropositive subjects.

Materials & Methods: This descriptive study was performed among 200 HIV positive patients (case group) and 200 age and sex matched non- HIV patients (control group) attending the ICTC in a tertiary care Hospital in Warangal. For the evaluation of HSV2 infection, blood samples were obtained and assessed for IgG antibody to HSV2 using ELISA method. The data was collected and analysed.

Results: Out of 200 cases, 82 were seropositive for HSV2 (41%) in case group and 24 of 200 (12%) in control group. Seropositivity was 41.4% in female and 40.6% in male, 41.8% in under and 33.3% in age over 40 years.

Conclusion: It can be derived that the seroprevalence of HSV2 in HIV positive subjects in our region is high and makes persons with HIV infection one of the most appropriate target group for serological testing of HSV2 infection.

Keywords: Herpes simplex virus (HSV2), Human Immunodeficiency Virus (HIV), seroprevalence, seropositivity.

INTRODUCTION

Herpes simplex virus type 2 (HSV2) transmitted via sexual route is now the most common cause of genital ulcer in the developed and the developing countries¹. Anti HSV2

antibody usually appears during puberty and is related to sexual activity and sexual partners of subjects². HSV2 infection is also one of the most common infections among HIV infected persons, partly because of the shared route of sexual transmission³. Increasing evidence demonstrates a substantial link between the epidemics of sexually transmitted HIV-1 and herpes simplex virus (HSV2) infection. More than 30 epidemiologic studies have demonstrated that prevalent HSV2 is associated with a 2 to 4 fold increased risk of HIV 1 acquisition. Per-sexual contact transmission rates among couples from Rakai, Uganda indicate that at all levels of plasma HIV 1 RNA in the source partner, HSV2 seropositive HIV 1 susceptible persons have a 5 fold greater risk of acquiring HIV 1 compared with HSV2 negative persons⁴. Serologic studies have demonstrated HSV2 seropositivity in the overwhelming majority of HIV 1 infected patients (95% in some series)⁵. Orolabial and anogenital disease caused by HSV in HIV 1 infected patients may vary from that in the non-HIV infected populations in severity of initial infection or severity or frequency of recurrence. Another difference is that acyclovir resistance is rarely encountered in a non-HIV infected host, but its frequency is increased in the HIV infected population⁶. One study found that HSV recurrences in HIV infected patients increased as CD4 counts decreased to <100 cells/cu mm⁷.

Similar to immunocompetent persons, most HIV infected persons with HSV2 infection are asymptomatic. However, almost all HSV2 seropositive persons shed HSV2 genitally, regardless of prior reported genital lesions⁸. Subclinical reactivation, or viral shedding (detection of virus on mucosal surface without clinical symptoms) of HSV2 infection is common in HIV infected and non-infected patients. HSV2 reactivation is more frequent in HIV infected patients⁹. HAART has little impact on subclinical HSV2 reactivation¹⁰. There is evidence that HSV2 reactivation is associated with increased HIV RNA levels¹¹ and that chronic daily HSV antiviral therapy decreases HIV RNA levels to baseline in patients not receiving HAART¹². This has led some authorities

to suggest that HSV suppressive therapy be considered in HIV infected patients who are not receiving effective ARV therapy⁴. These data show that greater attention to the diagnosis and treatment of HSV2 among HIV 1 infected persons is warranted, especially those who continue to be sexually active, those not on antiretroviral therapy, or those whose disease is not well suppressed by antiretrovirals⁴.

MATERIALS AND METHODS

This descriptive study was performed on consecutive serum samples collected from 200 HIV seropositive and 200 HIV seronegative individuals attending the ICTC in Mahatma Gandhi Memorial Hospital in Warangal in 2012. HIV seropositivity was determined according to the APSACS (Andhra Pradesh state AIDS control organization) guidelines using three rapid tests. Factors which were taken into account regarding history were age and sex of the individual, occupation, marital status, literacy. History of previous illness was elicited regarding ulceration and vesicular lesions over the genitalia, vaginal and/or urethral discharge and vesicular lesion in the mouth. Enquiry about high risk behavior was also made. For the evaluation of HSV2 infection, blood sample was obtained and assessed for IgG antibody using ELISA method with EQUIPAR HSV 2G kit (gG-2 specific). All the HIV seropositive and seronegative samples were subjected to the test. The data was collected and analysed.

RESULTS

From the total 200 HIV positive individuals, 118 were males and 82 were females. Age of the study group ranged from 18 – 58 years. 10% of the cases were single and 90% were married. Migrant labour were 84, housewives were 42, businessmen and other professionals were 46 and drivers were 6 and others 22. 82 of 200 cases were seropositive for HSV2 (41%) in case group and 24 of 200 (12%) in control group. Seropositivity was 41.4% in females and 40.6% in males with HIV infection. In the control group the seropositivity was 11.3% in females and 12.5% in males. HSV2 seropositivity was 41.8% in individuals less than 40 years of age and 33.3% in those more than 40 years. Urban and rural groups showed 43.5% and 39.3% positivity respectively. In relation to literacy, illiterate group showed 51.1% seropositivity and the literate group 33.3%.

DISCUSSION

Genital herpes is one of the most common sexually transmitted diseases. As a leading cause of genital ulceration herpes genitalis plays a role in facilitating the transmission of HIV. Individuals coinfecting with HIV and HSV2 have more frequent HSV recurrences than individuals infected with HSV2 alone. There is a strong correlation between decrease in CD4 count and increasing rate of HSV reactivation suggesting that reactivation is linked to immunosuppression. It is

recommended that all individuals with HIV should be serologically tested for HSV2. HSV2 infection should be targeted as a modifiable risk factor for HIV acquisition by testing, counseling, behavioural intervention, treatment and antiviral suppression¹³.

In the present study HSV2 IgG has been detected among 82 (41%) of the 200 HIV 1 seropositive samples tested. The control group of 200 HIV seronegative samples however has shown a 12% positivity rate.

There is a varied percentage seropositivity reported by different authors in their respective studies ranging from 6.5%¹⁴ to as much as 78%¹⁵. The various studies done earlier had chosen different study groups like HIV seropositive women, men with genital ulcers, asymptomatic heterosexual population, STD clinic patients, female sex workers, factory workers etc. and hence the results of their studies cannot be compared. The laboratory methods adopted were also different; Anti HSV 2 DNA by PCR, HSV2 IgG Enzyme immunoassay, Immuno-dot assay specific for glycoprotein G2 etc.

The control group of 200 HIV seronegative individuals showed 12% seropositivity, a result of less than 1/3rd of that of the case group. Results of their studies gave varied percentages ranging from as small as 1.21%¹⁴ to 58.2%¹⁶. In the control group males showed 12.5% and females 11.3% seropositivity. The seropositivity was 10.8% in the age group below 40 years, and 28.5% in age above 40 years in control group and correlates well with earlier studies¹⁷.

The results of the present study are comparable with studies conducted in Germany¹⁸ and Europe¹⁹. Since HSV infection is stated to be the commonest ulcerative genital disease in the sexually active age group, it is not uncommon for the control group to show significant values.

The results of HSV 2 seropositivity have shown that there is a gradual increase in the percentage seropositivity as age advanced, with 41.8% in <40 years. However, in the age group of >40 years the seropositivity is again low (33.3%). Previous studies have shown that there is an age dependent increase of seroprevalence in both sexes reaching its peak in those aged 40 and older¹⁷. Most probably the low percentage seen in the higher age group in the present study is because of low sample size of 9.

The prevalence of HSV2 is more or less similar in females (41.4%) and males (40.6%) with only a marginal increase of 0.8% in females. Several studies estimate the risk of susceptible females for contracting HSV from infected males to be 80% after a single contact²⁰. One of the factors found to influence acquisition of HSV2 was gender of the patient; the acquisition is greater for women than men²¹.

The seropositivity of HSV2 in drivers and migrant labours is 100% and 42.8% respectively. Both the group are considered as high risk groups as promiscuity in these groups is high. Occupational factor has not been evaluated in previous reports, but in one study in Brazil, seroprevalence was higher in housewives, due to low awareness of women about sexual activity, high rate of male to female transmission and possibility of multiple partners of their husbands. Seropositivity in the illiterate for HSV2 is found to be higher (51.1%) compared to the literate group (33.3%). Unmarried and single individuals showed a higher prevalence of 70%, and married showed a lesser rate with 37.7%.

The control group showed similar trends as other studies when results are compared taking into account age, sex, marital status, occupation and literacy.

CONCLUSION

The synergistic relationship between HIV 1 and HSV2 can be substantial especially in developing countries like India that have high prevalence of both viral infections. WHO had issued guidelines for the syndromic management of genital ulcer disease that includes antiviral treatment for genital herpes¹³. Persons with HIV infections are one of the most appropriate target group for serological testing for HSV2 infection²².

Serological testing for HSV2 in HIV infected persons can effectively retard the spread of the genital herpes epidemic in the immunocompromised population, by timely intervention, counseling for safe sex, encouraging monogamous relationships and institution of effective antiviral therapy and therapeutic viral vaccines. In the long run this intervention prolongs the life of HIV seropositive individual, as antiherpetic therapy effectively decreases HIV plasma load and stabilizes CD4 counts.

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