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Seroprevalence of HSV 2 among MSM Group in Tirunelveli District

KEYWORDS: Herpes simplex virus 2, MSM, HIV, HSV- 2 ELISA IgG

Amudha VP
M.D., Assistant Professor, Department of Microbiology, Tirunelveli Medical College, Tirunelveli - 627 011, Tamil Nadu, India

Sudharshan M
MBBS student., Department of Microbiology, Tirunelveli Medical College, Tirunelveli - 627 011, Tamil Nadu, India

Sucilathangam G
M.D., Assistant Professor, Department of Microbiology, Tirunelveli Medical College, Tirunelveli - 627 011, Tamil Nadu, India

Revathy C
M.D., Professor and Head, Department of Microbiology, Tirunelveli Medical College, Tirunelveli - 627 011, Tamil Nadu, India

ABSTRACT Herpes simplex virus type 2 (HSV-2) infection is considered to be almost exclusively sexually transmitted and may be symptomatic or asymptomatic. The majority of sexual HSV transmission occurs during asymptomatic periods because the patients are unaware of the asymptomatic virus shedding. The present study was undertaken to find the seroprevalence of HSV 2 among the study group and also to find association of HSV- 2 seropositivity with HIV.Serum samples were collected from 50 MSM and 50 heterosexuals attending the outpatient clinics of the STD Department. All samples were subjected to detect IgG specific antibodies against herpes simplex type 2 by HSV- 2 ELISA IgG (gG2 purified), an indirect immunoenzyme assay. Out of the 50 MSM samples who were tested , 22 (44%) were HSV 2 positive. . Also 7 were positive to HIV infection. Of these seven, all were positive for HSV 2 infection also and 2 (4%) were positive for VDRL test.There is a strong and consistent association between HSV 2 and HIV infection. HSV 2 promotes easy acquisition of HIV infection. Thus early diagnosis and treatment of HSV 2 can prevent the acquisition of HIV infection.

Introduction

Herpes simplex virus (HSV) infection is one of the most common viral sexually transmitted diseases worldwide, affecting more than one in five sexually active adults with an global estimate of 536 million infected persons and an annual incidence of 23.6 million cases among persons aged 15 to 49 years[1].

Herpes simplex virus type 2 (HSV-2) infection is considered to be almost exclusively sexually transmitted and may be symptomatic or asymptomatic. The majority of sexual HSV transmission occurs during asymptomatic periods because the patients are unaware of the asymptomatic virus shedding[2].

Recently there has been an increased recognition of male-to-male transmission of STDs and HIV in the country and the National AIDS Control Organization, has initiated HIV sentinel surveillance and behavioral surveillance in the MSM group[3] which has found HIV prevalence of 7.3 percent among MSM in 2010, down from 7.4 percent in 2007.

The potential role of HSV-2 infection in facilitating HIV transmission highlights the need for including anti-HSV-2 testing particularly in such a high risk group, for reducing the risk of transmission of HIV through herpetic lesions[4].

The HSV infection may be identified directly by detection of the virus or one of its components or indirectly by assaying for specific serum antibodies of the viruses. After infection with HSV, specific antibodies are formed against the pathogen, which can be detected by various immunological methods. The most significant potential application of serology is to detect the silent carriers of HSV-2, especially in high-risk settings[5].

The present study was undertaken to find the seroprevalence of HSV-2 among persons who have sex with men in Tirunelveli district. Existence of any correlation of HSV- 2 infections with other STDs including HIV and syphilis will also be attempted.

Materials and Methods

After obtaining Institutional Ethical Committee approval, Serum samples were collected from 50 MSM and 50 heterosexuals attending the outpatient clinics of the STD Department in Tirunelveli Medical college hospital.

Inclusion criteria

1. MSM patients who are sexually active for the past one year, attending the outpatient clinics of the STD department.
2. MSM patients undergoing treatment for sexually transmitted diseases including HIV.

Exclusion Criteria

1. Unwillingness to participate in the study.

At each sentinel site, a counsellor explained the study objectives to potential participants and obtained a written, informed consent for their participation as well as for providing blood samples for nonanonymous HIV, HSV-2, and syphilis testing, including consent for storage of samples for further testing and/or for contact for future studies.

A predesigned structured Proforma having information on socio-demographic variables such as age, education, occupation, marital status, geographic location, annual income and risk factors that may be associated with sexually transmitted diseases like number and type of sex partners in previous one year, use of condom, alcohol consumption, coitarchal age, previous HIV testing and diagnosis, self-

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reported past evidence of STIs and illegal drug use in the recent past will be recorded.

For all cases, the clinical history, signs & symptoms associated with genito-pelvic infections, including previous history of genital ulcer, pelvic pain, discharge, pain during sexual intercourse, genital warts, and examination of the genitals, anus, lymph nodes, skin, and oropharynx will be obtained with the help of the treating physician.

All the subjects were screened for other common sexually transmitted diseases by standard laboratory procedures / commercially available kits. The history and treatment particulars of other sexually transmitted diseases was noted. The HIV status of the individual will be recorded after obtaining consent.

HSV 2 ELISA IgG (gG2 purified), an indirect immunoenzyme assay to detect IgG specific antibodies against herpes simplex type 2 in human serum will be used. The development of HSV type-specific serology tests based on purified glycoprotein G (IgG), which differentiates between HSV-1 and HSV-2 infection, is an important tool for the diagnosis of genital herpes.

All the participants were informed about the confidentiality of their test results. Exploratory evaluation of possible associations between HSV-2 infection and other variables was done by use of odds ratios (ORs) and associated 95% confidence intervals (CIs) All statistical analyses were performed using SPSS 22.0 version.

Results

Out of the 50 MSM who were tested, 22 (44%) were HSV 2 positive and 7 (14%) persons were positive to HIV infection. All the HIV positive persons were positive for HSV 2 infection also.2 out of 50 were positive for VDRL test. Among the 22 persons who were positive for HSV 2 infection, maximum members 17 (34%) were among 30 to 35 years of age.12 out of 22 (54.54%) HSV 2 positive persons were from low socioeconomic status.17 (77.27%) out of 22 HSV 2 positive persons were from rural area.13 (59.09) people out of 22 were either skilled or unskilled labourers.12 (54.54%) people out of 22 were single whereas 10 (45.45%) were married.(Table-1)Out of 50 heterosexuals tested for Seroprevalence of HSV2 infections as controls,12 persons (24%) were positive showing that asymptomatic infections are more common with HSV-2 infections.(Table-2)

Discussion:

NACO has defined MSM as: Men who have engaged in sex - anal or oral - with another male at least once in the previous month. With the help of NGOs, 50 MSMs who were willing to give informed written consent were included in the study. The sampling strategy was consecutive samplings of those that fulfilled the inclusion criteria and were present at the site on the day of the visit of the investigator.

The number of MSMs is steadily increasing in our country. Data from many different surveys across the country show that same sex activity exists and is prevalent across India in both urban and rural areas. One study done in several villages reported that nearly 10 per cent of single men and 3 per cent of married men engaged in same sex behaviour [6]. Another survey showed that 7 per cent of male college students in Chennai had their first sexual experience with another male[7]. A different sexual behaviour survey in Uttar Pradesh reported that approximately 54 per cent of male respondents indicated some type of same sex behaviour during their lifetime[8].

In the present study the lowest age of HSV-2 positivity was 21 years and highest age was 45 years. More number of cases were seen as age advanced. An increase in HSV-2 prevalence with increasing age may not directly imply older age as a risk factor for HSV-2 infection. A high HSV-2 prevalence at older age in the community could be because of the cumulative effect since HSV-2 remains latent in the body after infection, thereafter the individual will test positive for HSV-2 any time after the exposure to the virus.

The maximum number of HSV 2 positive persons (21 persons [95.45%]) were either Unemployed or daily labourers and 12 persons (54.54%) were from Low socio economic group and 14 persons (63.63%) had low levels of education i.e. less than secondary education. Individuals from lower socioeconomic groups and those with poor educational background have higher rates of genital herpes infection[5]. These individuals may have lack access to accurate sexual and reproductive health, idleness, lack of recreational facilities, and poor management of reproductive health problems including STDs. This could be the reason for the significantly higher prevalence of HIV and HSV-2 among the lower strata. NACO reveals that MSM are a part of all socio-economic groups and span all religious as well as other social groups[9].

Of the HSV 2 positives, 10 (45.45%) were currently married and living with female partner. Nearly half of the study group had sexual contact with other females too. During sexual act with female partners, only half of the men used condoms. Majority cited the reason for not using a condom during a last sexual act with their female partners was that they did not feel a condom was necessary, or that they believed a condom was not required while having sex with their wives. The MSM group is extremely important to focus in the Indian context as being vulnerable to HIV infection themselves; they can also act as bridge population between high-risk groups (HRGs) and general female population.A study conducted at a drop-in center for MSM in Mumbai showed that nearly 23 per cent of MSM were married and that being married to a woman was actually associated with a much higher risk of being HIV positive (23.8% for married men vs. 9.1% for others)[10].

Among the study group, two cases tested positive for VDRL of which one case had been treated for VDRL positivity 4 months back. The information available about STIs in Indian MSM is much more limited. In a clinic based study in Mumbai, 20 per cent of MSMs were diagnosed with a clinical STI[11]. In STI clinics in Pune, 21.5 per cent of MSM had a genital ulcer disease[12]. A study from Tamil Nadu which used respondent-driven sampling found a herpes simplex virus-2 (HSV-2) prevalence of 28 percent among MSM[13].

In this study 50 heterosexuals were tested for Seroprevalence of HSV2 infections as controls. Of which 12 persons (24%) were positive showing that asymptomatic infections are more common with HSV-2 infections. None of the control group was HIV reactive. But 7 (14%) MSMs were positive for HIV. Historically as well as now, most discourse regarding the health of MSM populations worldwide has centered on HIV and the AIDS epidemic. Thus even though the spread of HIV is possible in heterosexuals, it is more in MSMs as they remain asymptomatic for a long period of time. MSMs in India have a higher prevalence of HIV than the general population (7.3 vs 0.36%, respectively). In Mumbai, men seeking services at a voluntary counselling and testing center had HIV rates of 12.5 per cent, those recruited from two clinics had a rate of 17 per cent, and male sex workers had a rate of 33 per cent. Additionally, NACO's BSS and HIV Sentinel Surveillance surveys estimate HIV prevalence to be between 5 to 17 per cent

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among MSM in over 28 districts and 10 States (Karnataka, Andhra Pradesh, Manipur, Maharashtra, Delhi, Gujarat, Goa, Orissa, Tamil Nadu and West Bengal)[14]. MSM recruited for testing by peer referral in Tamil Nadu had a HIV prevalence of 8 per cent and the married MSM subpopulation in the study had a rate of 14 per cent[13].

There may be a probable under-reporting of same sex behaviour due to stigma surrounding such behaviours and relationships. However, the point is that same sex behaviours in India are prevalent and warrant attention from the medical community in delivering appropriate health care.The biology of genital herpes supports its role in HIV acquisition. Acquisition of HIV may be facilitated by mucosal disruption. In addition, because herpetic ulcerations are associated with influx of CD4-T lymphocytes, a larger number of target cells for HIV attachment and entry are presenting the genital tracts of persons with HSV-2 infection. Among persons with HIV infection, migration of activated lymphocytes to genital herpes lesions can result in increased local HIV replication on mucosal surfaces. As HSV 2 stays latent in nerve ganglia many HIV-infected persons reactivate HSV frequently, local bursts of HIV shedding from genital lesions may provide an explanation as to how genital ulcers facilitate HIV transmission.

Conclusion

The high rates of HIV and STIs in Indian MSM may be due to several reasons, including lack of education, lack of access to basic health care, marginalization, social stigma, and the psychological consequences of such which may in turn, lead to increased risk-taking behaviours, commercial sex work, increased exposure to sexual violence, and substance use. However, appropriate interventions among this group, including health care access, counselling, and STI treatment are proven ways to decrease the transmission in this population and in controlling rates of HIV incidence in the whole population.

To conclude, these data have confirmed a strong and consistent association between HSV 2 and HIV infection. This is consistent with the results from epidemiological studies in other population as well as clinical studies .The high prevalence of both infections among young people underlies the urgent need for increased education and counselling among adolescents to discharge unprotected sexual contact and reduce the number of partners.

Since HIV and STI transmissions do not occur in a vacuum, patients should be encouraged to have partners (both male and female partners, including wives) tested and screened for HIV and STIs. This may be challenging, especially for MSM who are also married, since this is likely to upset marital dynamics; but it is important that physicians encourage patients to have their partners tested if the chain of transmission is to be stopped.

A trial of suppressive therapy with antiviral drug (Acyclovir) in persons who are at high risk for HIV acquisition may clarify the role of HSV 2 in the spread of HIV infection.

TABLES AND FIGURES

Table 1: HSV-2 seroprevalence distribution by subjects' sociodemographic characteristics

Sociodemographic Characteristics	Study population	HSV-2 positive cases	HSV-2 prevalence in the study population		
	N=50	100%	N=22	44%	44%
AGE GROUP					
20-25	7	14%	1	4.54 %	14.28%
26-30	12	24%	5	22.75 %	41.66%
31-35	17	34%	9	40.90 %	52.94%
36-40	10	20%	6	27.27 %	60%
>40	4	8%	1	4.54 %	25%
OCCUPATION					
Govt./Non Govt Service	4	8%	1	4.54 %	25%
Businesss	1	2%	-	-	-
Worker/ Labourer	22	44%	13	59.09 %	59.09%
Student	1	2%	-	-	-
Unemployed	12	24%	8	36.36 %	66.66%
SOCIOECONOMIC STATUS					
Lower	32	64%	12	54.54 %	37.50%
Middle	17	34%	10	45.45 %	58.82%
Higher	1	2%	-	-	-
EDUCATION					
Secondary Or More	16	32%	8	36.36 %	50%
Less Than Secondary	34	68%	14	63.63 %	41.17%
MARITAL STATUS					
Single	28	56%	12	54.54 %	42.85%
Married	20	40%	10	45.45 %	50%
Divorced	2	4%	-	-	-
RESIDENCE					
Rural	37	74%	17	77.27 %	45.94%
Urban	13	26%	5	68.18 %	38.46%
LIFETIME NUMBER OF SEXUAL PARTNERS					
ONE	32	64%	10	45.45 %	31.25%
TWO	12	24%	8	36.36 %	66.67%
THREE	4	8%	1	4.54 %	25%
FOUR	2	4%	1	4.54 %	50%

Table 2: ELISA TEST RESULTS

IgG ELISA result	Positive	Negative
MSM	22(44%)	28(56%)
Heterosexuals	12(24%)	88(76%)

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References

1. E. Tronstein, C. Johnston, M.-L. Huang, S. Selke, A. Magaret, T. Warren, L. Corey, A. Wald. Genital Shedding of Herpes Simplex Virus among Symptomatic and Asymptomatic Persons With HSV-2 Infection. JAMA: The Journal of the American Medical Association, 2011; 305 (14): 1441
2. Anzivino E, et al. Herpes simplex virus infection in pregnancy and in neonate: status of art of epidemiology, diagnosis, therapy and prevention. Virol J. 2009 Apr 6;6:40.
3. National AIDS Control Organization India. National Baseline High Risk and Bridge Population Behavioural Surveillance Survey. Part- II (MSM and IDUs). Available from http://www.nacoonline.org/publication/51.pdf
4. Santos FC, de Oliveira SA, Setubal S, Camacho LA, Faillace T, Leite JP, Velarde LG: Seroepidemiological study of herpes simplex virus type 2 in patients with the acquired immunodeficiency syndrome in the city of Niteroi, Rio de Janeiro, Brazil. MemInst Oswaldo Cruz 2006, 101(3):315-319.
5. Ashley R L, Wald A., Genital Herpes: Review of the epidemic and potential use of type-specific serology. ClinMicrobiol Rev 1999;12(1):1–8
6. Verma RK, Collumbien M. Homosexual activity among ruralIndian men: Implications for HIV interventions. AIDS 2004; 18 : 1845-7.
7. Hausner D. S25. exual risk among male college students in Chennai, India: Implications for HIV prevention strategies. XIII International AIDS Conference. July 2000, Durban, South Africa. Abstract no. TuOrD437.
8. Raizada A, Gupta S, Kumar A. Sexual practices other than peno-vaginal sex: Perceptions and practices in an urban community. Indian J Commun Med 2002; 27 : 177-80
9. National AIDS Control Organization. Computerized Management Information System (CMIS) Bulletin. 2008-09.
10. Kumta S, Lurie M, Weitzen S, Jerajani H, Gogate A, Row-kavi. A, et al. Bisexuality, sexual risk taking, and HIV prevalence among men who have sex with men accessing voluntary counseling and testing services in Mumbai, India. J Acquir Immune DeficSyndr2010; 53 : 227-33.
11. Setia MS, Lindan C, Jerajani HR, Kumta S, Ekstrand M, Mathur M, et al. Men who have sex with men and transgenders in Mumbai, India: An emerging risk group for STIs and HIV. Indian J DermatolVenereolLeprol2006; 72 : 425-31.
12. Gupta A, Mehta S, Godbole SV, Sahay S, Walshe L, Reynolds SJ, et al. Same-sex behaviour and high rates of HIV among men attending sexually transmitted infection clinics in Pune, India (1993-2002). J Acquir Immune DeficSyndr2006; 43 : 483-90.
13. Solomon SS, Srikrishnan AK, Sifakis F, Mehta SH, VasudevanCK, Balakrishnan P, et al. The emerging HIV epidemic among men who have sex with men in Tamil Nadu, India: Geographic diffusion and bisexual concurrency. AIDS Behav2010; 14 : 1001-10.
14. National AIDS Control Organization. Annual report 2010-2011. New Delhi: Department of AIDS Control, Ministry of Health and Family Welfare, Government of India; 2011.