JOURNAL OF PURE AND APPLIED MICROBIOLOGY, October 2011. Vol. **5**(2), p. 899-902

Seroprevalence of HSV-2 in Patients Attending STD Clinic

Suresh B. Sonth[1], Mahesh C. Baragundi[2], Shivakumar S. Solabannavar[3], C.S. Patil[4], V.L. Jayasimha[5], Yemul Vishwanath[6] and V. Vijayanath[7]

[1-4,6]Department of Microbiology, S.N Medical College, Bagalkot - 587 107, India.
[5]Department of Microbiology, S.S. Institute of Medical Sciences and Research Centre, Jnanashankara, NH-4 Bypass Road, Davangere - 577 005, India.
[7]Department of Forensic Medicine & Toxicology, VMKV Medical College, Salem, India.

(Received: 06 February 2011; accepted: 18 March 2011)

The present investigation was undertaken to study HSV-2 seroprevalence rate among STD clinic attendees. Genital herpes is one of the most common sexually transmitted disease and is the most common cause of genital ulceration, in both the developed world and in developing countries. Genital herpes can act as a co-factor for the transmission of other sexually transmitted diseases. Out of 1000 STD patients, 650 (65%) were males while 350 (35%) were females. 194 (19.4%) of 1000 patients attending STD clinic were positive for HSV–2 IgM antibodies. As Genital herpes is the most common cause of genital ulcers in both developed & developing world and as it acts as a fueling agent for the transmission of other sexually transmitted diseases, it is therefore an important indicator to follow to promote healthful sexual behavior and prevent sexually transmitted diseases.

Key words: HSV, STD, STI, Type specific antibody.

Genital herpes infection is the most common cause of genital ulceration, in both the developed world and in developing countries[1,2]. Infection caused by herpes simplex virus has become an important public health problem[3]. It is one of the most common sexually transmitted infections (STIs) with an estimated 20 million new infections annually worldwide[4]. Seroprevalence studies revealed that we diagnose only about 20% of patients with genital herpes and that the majority of these cases are unrecognized by both patients and clinicians[5]. Clearly, undiagnosed genital herpes infections are the major factor in fuelling the genital herpes epidemic, as source partners in most transmission events are unaware that they have genital herpes. Patients shed the virus and transmit it even in the absence of clinical signs[6]. Although the efficacy of transmission is higher at the time of lesions, most transmission has been shown to occur during periods of asymptomatic viral shedding[7,8]. Genital herpes recurs frequently and causes significant morbidity to the individuals. The incidence of HSV infections has been increasing in recent years. There is a risk of neonatal transmission of HSV infection in affected women[9]. Genital herpes, especially newly acquired infection, may be associated with HIV acquisition and transmission[10,11,12]. It is therefore not surprising that genital herpes has been labeled as "a persistent health care problem, which calls for continuing public awareness"[13].

* To whom all correspondence should be addressed.

Herpes simplex virus type-2 (HSV-2) has been recognized as the most common cause of genital ulcers in the developed and the developing world than HSV-1 [2]. Type specific serological tests can help in the diagnosis of these cases. Commercially reliable assays have been available for the last few years and has been increasing to used for the diagnosis, at least in populations with a high prevalence rate (for example, sexually transmitted disease (STD) clinic attendees). To plan a management strategy for the prevention and treatment of genital herpes, we undertook this study to assess the prevalence of genital herpes[14]. However reliable data on HSV-2 seroprevalence remains sketchy.

MATERIAL AND METHODS

A total of 1000 blood samples were collected from patients who were attending STD clinic at a tertiary care hospital, in the northern part of Karnataka from January 2008 to June 2009. 500 blood samples of asymptomatic persons from community were also collected who served as control group. The sera were tested for HSV-2 IgM antibodies by ELISA [NOVATEC, HSV (Recom) ELISA, Dietzenbach (Germany)]. Complete history of patient regarding age, sex, contact history, occupation and other risk factors was also collected after taking consent. The results were analyzed statistically.

RESULTS

Out of 1000 STD patients, 650 (65%) were males while 350 (35%) were females. 194 (19.4%) of 1000 patients attending STD clinic were positive for HSV–2 IgM antibodies. Out of 194 positive cases, 106 were males and 88 were females (Table-1).

In the control group, 44/500 (8.8%) persons were positive for HSV. Highest HSV seroprevalence in STD patients was in the age group of 26-35 years (40.67%). In the control group, seropositivity was high in the age group of 26-35 years (13.69%) (Table-2)

High prevalence was seen in patients with nonspecific discharge (45%), genital ulcers (38.4%) ,illiterate patients (78%) and those with multiple partners (62.4%).

Table 1. Sex wise distribution of HSV positive individuals

Total no of patients (n=1000)		Total no of positives [n=194 (19.4%)]	
Male	Female	Male	Female
650 (65%)	350 (35%)	106 (54.6%)	88 (45.4%)

Table 2. Risk factor associated with HSV seropositivity

Associated factor	No of cases	No of positive	No of controls	No of positive
Age (Years)				
16-25	157	15 (9.55%)	75	4 (5.33%)
26-35*	268	109 (40.67%)	168	23 (13.69%)
36-45	416	62 (14.9%)	207	16 (7.72%)
46-55	110	6 (5.45%)	37	1 (2.7%)
56-65	49	2 (4.08%)	13	0 (0%)
Total	1000	194 (19.4%)	500	44 (8.8%)

* $p < 0.05$ Significant

DISCUSSION

The seroprevalence of HSV–2 infection has been well documented in many countries. Studies amongst family planning clinic attendees and students have suggested a positive relationship between sexual behavior and HSV type 2 seropositivity [15,16]. Seropositivity has also been shown to be higher amongst women than men and is thought to be due to the greater efficiency of transmission of HSV from male to female than from female to male[8]. The current study also shows higher prevalence in women than men.

HSV seropositivity was highest in the young age group of 21-30 years because of their sexually active life [17,18]. Adolescents are known to be at increased risk of acquiring STIs because of fewer protective antibodies and increased susceptibility of cervix[18]. In the present study, HSV seropositivity is highest among age group of 26-35 years followed by 36-45 years.

A number of factors have been suggested to have contributed to the wide dissemination of STD and among them social factors are found to have a particular significance[19]. Seropositivity was high in illiterate persons because of ignorance and in persons with multiple partners because of high risk behavior. High seropositivity was also seen in persons with non-specific discharge and genital ulcers[20,21]. Genital herpes infection is the most common cause of genital ulceration, in both the developed world and in developing countries[1,2]. Regarding prevalence in BOH (Bad Obstetric History) cases, HSV is one of the TORCH organisms and infection in pregnancy accounts for half of the morbidity and mortality among neonates. It may also lead to abortion/prematurity/ intrauterine growth retardation and disseminated infection of neonates[22]. Women are more vulnerable to STIs as they have less say in the contraception methods, less opportunity for early diagnosis and treatment and are more prone to infections because of procedures like MTP, IUD insertions etc[23]. Asymptomatic shedding can infect their neonates and they themselves are at more risk to develop cervical cancer[24], therefore, it is important to screen them.

Unlike patients with other genital ulcerative diseases, those who have had genital herpes are often unaware of HSV predisposes to other STIs as it causes mucosal erosions and may increase the concentration of HIV as HSV leads to disruption of epithelial barrier and leading to infiltration of CD4 cells locally in the genital mucosa and other microbes in semen and vaginal fluids[23]. The high seroprevalence of HSV-2 may act as one of the contributing factors for the acquisition of other STIs and our efforts to reduce HSV-2 infection should be the prevention of new STIs[12,25]. Early detection, treatment, counseling and health education of genital herpes cases would play an important role in controlling other STIs.

REFERENCES

1. Nahmias AJ, Lee FK, Beckman-Nahmias S. Sero-epidemiological and -sociological patterns of herpes simplex virus infection in the world. *Scand J Infect Dis* 1999; **69**(suppl): 19–36.
2. Chen CY, Ballard RC, Beck-Sague CM, *et al*. Human immunodeficiency virus infection and genital ulcer disease in South Africa: the herpetic connection. *Sex Transm Dis* 2000; **27**: 21-9.
3. Mindel A. Genital herpes-how much of a public-health problem? *Lancet* 1998; **351**(Suppl 3): 16-18.
4. Cowan FM, Johnson AM, Ashley R, *et al*. Antibody to herpes simplex virus type 2 as serological marker of sexual lifestyle in populations. *BMJ* 1994; **309:** 1325–9.
5. Johnson RE, Lee F, Hadgu A, *et al*. US genital herpes trends during the first decade of AIDS, prevalences increased in young whites and elevated in blacks. *Sex Transm Dis* 1994; **21**(suppl): S109
6. Koutsky LA, Stevens CE, Holmes KK, *et al*. Underdiagnosis of genital herpes by current clinical and viral-isolation procedures. *N Engl J Med* 1992; **326:** 1533–9.
7. Rooney JF, Felser JM, Ostrove, *et al*. Acquisition of genital herpes from an asymptomatic sexual partner. *N Engl J Med* 1986; **314**: 1561-4.
8. Mertz GJ, Benedetti J, Ashley R, *et al*. Risk factors for the sexual transmission of genital herpes. *Ann Intern Med* 1992; **116**: 197-202.
9. Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice- the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect* 1999; **75**: 3-17.
10. Kreis J, Caraël M, Meheus A. Role of sexually transmitted diseases in transmitting human immunodeficiency virus. *Genitourin Med* 1988;

64: 1-2.

11. Hook EWD, Cannon RO, Nahmias AJ *et al*. Herpes simplex virus infection as a risk factor for human immunodeficiency virus infection in heterosexuals. *J Infect Dis* 1992; **165**: 251-55.
12. Holmberg SD, Stewart JA, Gerber AR *et al*. Prior herpes simplex virus type 2 infection as a risk factor for HIV infection. *JAMA* 1988; **259**: 1048-50.
13. Arvin AM, Prober CG. Herpes simplex virus type 2-a persistent problem. *N Engl J Med* 1997; **337**: 1158-59.
14. Narouz N, Allan PS, Wade AH, Wagstaffe S. Genital herpes serotesting: a study of the epidemiology and patients' knowledge and attitude among STD clinic attenders in Coventry, UK. *Sex Transm Infect* 2003; **79**: 35-41.
15. Gibson JJ, Hornung CA, Alexander GR, Lee FK, Potts WA, Nahmias AJ. A cross sectional study of herpes simplex virus types 1 and 2 in college students: occurrence and determinants on infection. *J Infect Dis* 1990; **162**: 306-12.
16. Breinig MK, Kingsley LA, Armstrong JA, Freeman DJ, Ho M. Epidemiology of genital herpes in Pittsburgh: serological, sexual and racial correlates of apparent and inapparent herpes simplex infections. *J Infect Dis* 1990; **162**: 299-305.
17. Venkitaraman AR, Seigneurin JM, Lenoir GM, John TJ. Infections due to the human herpes-viruses in southern India: A seroepidemiological survey. *Int J Epidemiol* 1986; **15**(4): 561-566.
18. Agarwal N, Gupta S. Reproductive tract infection in adolescent females. *Obs Gynae Today* 2000; **5**(7): 410-412.
19. Plorde DS. Sexually Transmitted Diseases in Ethiopia: Social factors contributing to their spread and implications for developing countries. *Br J Vener Dis* 1981; **57**: 357-362.
20. Mbizvo EM, Sia EM, Pedersen BS, Chirenje MZ, Munjome M, Hussain A. Association of herpes simplex virus type 2 with the human immunodeficiency virus among urban women in Zimbabwe. *Int J STD AIDS* 2002; **13**: 343-348.
21. Legori M. Prevalence of sexually transmitted infections and HBsAg among female sex workers of Thiruvananthapuram, Kerala, India. *J Acad Clin Microbiol* 2001; **3**(1): 5-9.
22. Mookherjee N, Gogate A. Incidence of HSV infection in bad obstetrics history (BOH) cases. *Indian J Med Microbiol* 1994; **12**(1): 60-64.
23. Pandey SN, Joshi JV, Vaidya RA, Vaidya AB. Reproductive tract infection. A scourge for women's health. *J Obst Gyn India* 2001; **51**(1): 71-77.
24. Shukla A, Das K, Mathur A, Mehra P. Herpes simplex virus type-2 in carcinoma cervix: A controlled serological study. *J Obst Gyn India* 1984; **34**(2): 315-318.
25. Wasserheit JN. Epidemiological synergy: interrelationships between human immunodeficiency virus infection and other sexually transmitted diseases. *Sex Transm Dis* 1992; **19**: 61-77.