

Alireza Janbakhsh (MD)<sup>\*1</sup>  
Feizollah Mansouri (MD)<sup>1</sup>  
Siavash Vaziri (MD)<sup>1</sup>  
Babak Sayad (MD)<sup>1</sup>  
Mandana Afsharian (MD)<sup>1</sup>  
Ahmadreza Abedanpor (MD)<sup>1</sup>

1- Department of Infectious  
Diseases Kermanshah University of  
Medical Sciences, Kermanshah,  
Iran.

**\* Correspondence:**

Alireza Janbakhsh, Department of  
Infectious Diseases Kermanshah  
University of Medical Sciences,  
Kermanshah, Iran.

E-mail: a\_janbakhsh@yahoo.com  
Tel: 0098 831 4276315  
Fax: 0098 831 4276315

Received: 6 Dec 2011  
Revised: 29 May 2012  
Accepted: 24 July 2012

## Seroepidemiology of herpes simplex virus type 2 (HSV2) in HIV infected patients in Kermanshah-Iran

### Abstract

**Background:** HSV2 has an important role in acquiring and transmitting HIV through genital ulcers. This study was conducted to determine the prevalence of this virus in HIV infected subject in Kermanshah, Iran.

**Methods:** This descriptive study was performed among 170 HIV positive patients (case group) and 165 non-HIV cases (control group)) referred to Behavioral Counseling Center of Kermanshah, western of Iran. For the evaluation of HSV2 infection, blood sample was obtained and assessed for IgG antibody of HSV2 using ELISA method. The data were collected and analyzed.

**Results:** Out of 170 cases, 11 were seropositive for HSV2 (6.5%) in case group and 2 of 165 (1.21%) in control group ( $p=0.015$ ). Seropositivity was 17.6% in female and 5.2% in male, 59% under and 8% age over 40. In HIV infected subjects, seroprevalence in female was 17.6% and in male was 5.2% ( $p=0.083$ ).

**Conclusion:** It can be derived that the seroprevalence of HSV2 in HIV positive patients in our region is relatively low. Hence, we do not recommend that HSV2 needs to be considered in HIV pretreatment evaluation program.

**Keywords:** HIV, HSV2, seroepidemiology

*Caspian J Intern Med 2012; 3(4): 546-549*

**H**erpes simplex virus type 2 (HSV2) transmitted via sexual route is now the most common cause of genital ulcer in the developed and the developing countries (1). Anti HSV2 antibody usually appears during puberty and is related to sexual activity and sexual partners of subjects. Several serologic investigations have revealed that pandemy of HSV2 has occurred during the last decade (2). Infection is also common among HIV positive patients because of common transmission route of both HIV and HSV2. Like healthy people, most HIV positive patients infected with HSV2, could asymptotically spread the virus (3). For this reason in countries that HIV/HSV2 coinfection is common, the importance of HSV2 as a causal agent of genital ulcer remains under estimated (4). In some reports, the reciprocal relation between the two agents have been emphasized and immune deficiency in HIV infected patients has been considered as an important factor for reactivation of HSV2 and also this agent as a cofactor has a role in acquiring and transmitting HIV through numerous microscopic genital ulcers mostly contain CD4 that facilitate transmission of HIV (5). Reactivation of HSV2 that including asymptomatic spreading of virus could increase plasma and genital secretion concentration of HIV that may influence natural course of HIV infection (3, 6). Evaluation of HIV infected heterosexual cases in Uganda has shown that HSV2 induced genital ulcers could increase 4 fold in transmission and 5 fold in serum level of HIV RNA (7). It is known that plasma concentration of HIV RNA in HIV/HSV2 co infected women under suppression therapy with Valacyclovir has been decreased compared to placebo (8).

The prevalence of HSV2 is marked variably in different populations with increased rate in HIV positive patients (33-91%) (9-15). With regard to the lack of published reports about HSV2 prevalence in Iranian HIV infected cases and not having information about the importance of prophylactic policy of HSV2 in pretreatment evaluation protocols of HIV patients in our practice, this study was conducted to determine the true prevalence of the virus of patients at Behavioral counseling Center of Kermanshah, western Iran.

## Methods

This descriptive study was performed among 170 HIV positive patients referred to Behavioral Counseling Center of Kermanshah- western Iran (as case group and HIV negative cases admitted in Imam Reza Hospital as control group) in 2009). HIV infection defined as two consecutive positive ELISA and consequently positive Western blot test. Sampling was recorded by convenient method. The variables include sex, age, educational degree, occupation, marriage and the behavioral history including the number of partners, homosexuality, drug injecting, prison history and also CD4 count, hepatitis B and C infection, antiretroviral therapy were obtained from the medical file and finally all the subjects were examined for the presence of genital lesion. For the evaluation of HSV2 infection, blood sample was obtained and assessed for IgG antibody using ELISA method (sensitivity 98%, specificity 97%) with Radim Kit, Italy that included gG2 antigen. We also checked HSV2 infection with the above mentioned method for 165 HIV negative persons were admitted in Imam Reza Hospital for comparing the serologic status of HSV2 in HIV positive and negative patients. This study has been approved by the Ethics Committee of our university with file number of 86051. The data were analyzed. The prevalence of seropositivity of HSV2 in HIV and non-HIV subjects were determined. In HIV positive subjects, the seroprevalence was compared based on some important variables.

## Results

From the total 170 HIV positive subjects, 153 (90%) were males and 17 (10%) females. All male cases were IV drug injectors and injecting was the probable main route of involvement. For the 17 females sexual transmission from their husbands was considered as the main route. The mean

age of cases was 36.4 years (ranged 20-59 years) and in control group was 34 years (ranged 18-65 years). Fifty-four percent of cases were single, 27% married and 18.9% were divorced. Eleven of 170 cases were seropositive for HSV2 (6.5%) in case group and 2 of 165 (1.21%) in control group (one male and one female) ( $p=0.015$ ). Seropositivity was 17.6% in female and 5.2% in male gender, with HIV infection ( $p=0.083$ ). Table 1 shows all variables evaluated in HIV subjects.

**Table 1. Data analysis in HIV positive patients according to HSV2 serostatus**

Variable		Positive HSV2	Pvalue
Sex	M	5.2%	0.083
	F	17.6%	
Age	<40Y	59%	0.52
	>40Y	8%	
Occupation	Driver	18.2	0.508
	House wife	13.3%	
	Worker	6.7%	
	Government employee	0	
Education	<diploma	5.6%	0.31
	>diploma	10.7%	
Multi partner	-	3.2%	0.154
	+	8.4%	
Prisoning	-	5.5%	0.90
	+	12.5%	
CD4 count	$\leq 200$	9.5%	0.302
	>200	12.5%	
HBV co-infection	-	6.3%	0.522
	+	9.1%	
HCV co-infection	-	4.8%	0.460
	+	7%	
Homo sexual	-	5.2%	0.44
	+	15.8%	
Drug abuse	-	17.6%	0.099
	+	5.3%	
ART treatment	-	4.8%	0.482
	+	8%	

## Discussion

Our study showed that the seroprevalence of HSV2 in HIV infected patients was 6.5%. Despite of not having any

documented data about the seroprevalence of HSV2 in HIV positive patients in Iran, one study has been conducted on pregnant women in Kermanshah, Iran in 2007, the frequency of HSV2 infection was reported to be 3.3% (16). A similar survey in Shiraz- south of Iran reported this rate of about 28.19% (17).

Darosa-Santos et al. reported the frequency of 73% for HSV2 on 150 cases of HIV positive patients (18). Russel et al. showed that the high prevalence of HSV2 in HIV infected subjects (19). In our study the HSV2 infection rate was significantly higher in HIV positive patients than non HIV that might be related to high risk behaviors in this group. It seems that our lower rate compared to other countries is due to unique lifestyle and social, cultural and religion limitations in sexual contact and probable lower rate of multiple partnerships in our country. Although in most reports, HSV2 infection frequency has been revealed to be higher in females, we think that the lower rate and the absence of significant difference in the present study may be due to a low number of female participants.

Our finding is compatible with prior seroepidemiologic studies in those sexual behavior and age have been considered as main risk factors in acquiring infection (19). Other investigations have recognized that the risk of HSV2 infection increased with age, lower educational degree, time of sexual activity start, history of sexually transmitted disease (STD), female gender and multiple sexual partners (13,18). The presence of risk factors was correlated with the increasing prevalence of HSV2 infection in this study, but this correlation was not significant.

The highest prevalence was noted in drivers (18.2%) and subsequently in housewives (13.3%) without significant correlation. Our experience shows that principally STD occurrence with high frequency in drivers may be related to culture and multiple partners in these kinds of people, thus, in our results, we consider driving job as a risk factor for acquiring HSV2 infection in HIV positive patients. 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 (18). This explanation may be true in our patients with high prevalence in females because they may have gotten HIV from their husbands. Likewise, our report shows that HBV and HCV co- infection with HIV could not increase the rate of HSV2

infection. Santos et al.'s study represented that although seroprevalence of HSV2 is high but the clinical presentation of infection is uncommon and only 21% of infected patients had history of symptomatic disease (20). In our study, despite lower rate of infection, none of the patients had active clinical lesions and history of genital lesions, so this finding emphasized that awareness of patients of the clinical signs of infection could be important.

In conclusion, it can be derived that seroprevalence of HSV2 in HIV positive patients in comparison to other studies is not noticeable and this infection is not the main risk factor to HIV patients and hence we do not recommend that HSV2 is needed to be considered in HIV pretreatment evaluation program.

We have not collected data from HIV negative people and so we can not compare all variables in HIV + and HIV - groups.

### Acknowledgments

We thank all staff of Kermanshah Behavioral Disease Consultation Center for valuable contribution to this work.

**Funding:** This study was supported by Kermanshah University of Medical Sciences (KUMS).

**Conflict of interest:** All authors have declared no conflicts of interest.

### References

1. Andreoletti L, Piednoir E, Legoff J, et al. High seroprevalence of herpes simplex virus type 2 infection in french human immunodeficiency virus infected outpatients. *J Clin Microbiol* 2005; 43:4212-17.
2. Corey L. Herpes simplex virus In: Mandell G, Bennett J, Dolin R. *Principle and practice of Infectious Disease*. 6th ed. Oxford: Elsevier Churchill Livingstone 2005; pp: 1763-5. Vol 2.
3. Corey L, Wald A, Celum CL, Quinn TC. The effects of herpes simplex virus - 2 on HIV -1 acquisition and transmission: a review of two overlapping epidemics. *J Acquir Immune Defic Syndr* 2004; 35: 435-45.
4. Baeten JM, Celum C. Herpes simplex virus and HIV1. HIV insite knowledge base chapter 2006. Available at: URL: <http://hivinsite.ucsf.edu/insite?Page=kb-05-03-02>. Accessed Aug5 2012.

5. Cunningham AL, Taylor R, Taylor J, et al. Prevalence of infection with herpes simplex virus type 1 and 2 in Australia: a nationwide population based surgery. *Sex Transm Infect* 2006; 82:164-8.
6. Strick LB, Wald A, Celum C. Management of herpes simplex virus type-2 infection in HIV type-1 infected persons. *J Clin Infect Dis* 2006; 43: 347-56.
7. Gray RH, Wawer M, Brookmeyer R, et al. Probability of HIV1 transmission per coital act in monogamous, heterosexual, HIV1 – discordant couples in Rakai, Uganda. *Lancet* 2001; 357: 1149-53.
8. Van Benthem BHB, Spaargaren J, Van den Hoek JAR, et al. Prevalence and risk factor of HSV1 and HSV2 antibodies in European HIV infected women. *Sex transm infect* 2001; 77: 120-4.
9. Stamm WE, Handsfield HH, Rompalo AM, et al. The association between genital ulcer disease and acquisition of HIV infection with human immunodeficiency virus. *J Clin Infect Dis* 1998; 21:114-20.
10. Allan PS, Das S. Prevalence of HSV1 / HSV2 antibodies in HIV seropositive patients in Coventry, United Kingdom. *Sex Transm Infect* 2004; 80: 77.
11. Mbopi – Keou F, Gresenguet G, Mayaud P, et al. Interactions between herpes simplex virus type 2 and Immunodeficiency virus type1 infection in African women: opportunities for intervention. *J Infect Dis* 2000; 182: 1090-6.
12. Boulos R, Ruff AJ, Nahmias A, et al. Herpes simplex virus type2 infection, syphilis and hepatitis B infection in Haitian woman with human immunodeficiency virus type1 and human T lymphocytic virus type1 infection. *J Infect Dis* 1992; 166: 418-20.
13. Chen CY, Ballard RC, Beck-segue CM, et al. Human immunodeficiency virus infection and herpes simplex Type2 infection among male STD clinic patients in South Africa. *Sex Transm Dis* 2000; 27: 21-9.
14. Gopal R, Gibbs T, Slomka MJ, et al. A monoclonal blocking EIA for herpes simplex virus type 2 antibody, validation for serological studies in Africa. *J Virol Methods* 2000; 87: 71-80.
15. Siegel D, Golden E, Washington A, Morse S, Fulldus M. Prevalence and correlates of herpes simplex infections. The population – based AIDS multiethnic neighborhoods study. *JAMA* 1992; 268: 1702-8.
16. Pourmand D, Janbakhsh A, Hamzehi K, Dinarvand F. Seroepidemiological study of Herpes Simplex virus in pregnant women referring to health and care center in Kermanshah (2003-2004). *Behbood* 2008; 11: 462-9. [In Persian].
17. Kasraeian M, Movasheghii M, Fotouhi Ghiam A. Seroepidemiological study of herpes simplex virus type 2 antibody in Shiraz, Iran. *Iran J Immunol* 2004; 3:189-193.
18. Da Rosa OL, Goncalves Da saliva A, Pereira AC Jr. Herpes simplex virus type 2 in Brazil: seroepidemiologic survey. *Int J dermatol* 1996; 35: 794-6.
19. Russel DB, Tabrizi SN, Russel JM, Gariand SM. Seroprevalence of herpes simplex virus type1 and 2 in HIV – infected and uninfected homosexual men in primary care setting. *J Clin Virol* 2001; 22: 305-13.
20. Santos F, de Oliveira SA, Setubal S, et al. Seroepidemiological study of herpes simplex virus type2 in patients with the acquired immunodeficiency syndrome in the City of Niteroi , Rio de Janeiro , Brazil . *Mem Inst Oswaldo Cruz* 2006; 101: 315-9.