

ORIGINAL RESEARCH

To Determine the Seroprevalence of Herpes Simplex Type 2 (HSV-2) Infection in Pregnant Females

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ABSTRACT

Aim: To Determine the Seroprevalence of Herpes Simplex Type 2 (HSV-2) Infection in Pregnant Females. **Materials and Methods:** 100 Serum specimens were screened for HSV-2 infection by detecting IgG class antibodies against HSV-2-specific glycoprotein G-2 using an enzyme-linked immunosorbent assay kit (RADIM SpA, Italy) in the department of Microbiology. These serum specimen was screened for HIV-1 and HIV-2 antibodies by the ELISA technique. **Results:** Out Of total 100 serum sample enrolled for the study. The age of the patients ranged from 17 to 42 years (mean 26.11 ± 4.27). The most common age groups were 20–25 years (45%), followed by 25–30 (36%), above 30 (14%) and below 20 (5%). In our study, seropositivity was maximum in the age group Above 30 years (14.29%), followed by 25–30 years (11.11%), 20–25 years (4.44%) and below 20 years (0%). No any one sample is HIV Positive. **Conclusion:** Genital herpes is a chronic condition that may be prevented. While the majority of HSV infections may not show any noticeable symptoms, those with clinical manifestations may lead to significant physical and psychological suffering.

Keywords: Herpes simplex virus type 2, Seroprevalence, Pregnant Females

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INTRODUCTION

Herpes simplex is a viral infection caused by the herpes simplex virus.[1] Infections are categorized based on the part of the body infected. Oral herpes involves the face or mouth. It may result in small blisters in groups often called cold sores or fever blisters or may just cause a sore throat.[2-5] Genital herpes, often simply known as herpes, may have minimal symptoms or form blisters that break open and result in small ulcers.[1] These typically heal over two to four weeks.[1] Tingling or shooting pains may occur before the blisters appear.[1] Herpes cycles between periods of active disease followed by periods without symptoms.[1] The first episode is often more severe and may be associated with fever, muscle pains, swollen lymph nodes and headaches.[1] Over time, episodes of active disease decrease in frequency and severity.[1] Other disorders caused by herpes simplex include: herpetic whitlow when it involves the fingers,[6] herpes of the eye,[7] herpes infection of the brain,[8] and neonatal herpes when it affects a newborn, among others.[9] There are two types of herpes simplex virus, type 1 (HSV-1) and type 2

(HSV-2).[1] HSV-1 more commonly causes infections around the mouth while HSV-2 more commonly causes genital infections. [2] They are transmitted by direct contact with body fluids or lesions of an infected individual.[1] Transmission may still occur when symptoms are not present.[1] Genital herpes is classified as a sexually transmitted infection.[1] It may be spread to an infant during childbirth.[1] After infection, the viruses are transported along sensory nerves to the nerve cell bodies, where they reside lifelong.[2] Causes of recurrence may include: decreased immune function, stress, and sunlight exposure.[2,3] Oral and genital herpes is usually diagnosed based on the presenting symptoms.[2] The diagnosis may be confirmed by viral culture or detecting herpes DNA in fluid from blisters.[1]

Testing the blood for antibodies against the virus can confirm a previous infection but will be negative in new infections.[1] The most effective method of avoiding genital infections is by avoiding vaginal, oral, and anal sex.[1] Condom use decreases the risk.[1] Daily antiviral medication taken by someone

who has the infection can also reduce spread.[1] There is no available vaccine [1] and once infected, there is no cure.[1] Paracetamol (acetaminophen) and topical lidocaine may be used to help with the symptoms.[2] Treatments with antiviral medication such as aciclovir or valaciclovir can lessen the severity of symptomatic episodes.[1,2] Worldwide rates of either HSV-1 or HSV-2 are between 60% and 95% in adults.[4] HSV-1 is usually acquired during childhood. [1] Rates of both increase as people age.[4] Rates of HSV-1 are between 70% and 80% in populations of low socioeconomic status and 40% to 60% in populations of improved socioeconomic status.[4] An estimated 536 million people worldwide (16% of the population) were infected with HSV-2 as of 2003 with greater rates among women and those in the developing world.[10] Most people with HSV-2 do not realize that they are infected.[1] The name is from Greek: ἕρπης *herpēs*, which is related to the meaning "to creep", referring to spreading blisters.[10,11] The name does not refer to latency.[12]

MATERIALS AND METHODS

100 Serum specimens were screened for HSV-2 infection by detecting IgG class antibodies against HSV-2- specific glycoprotein G-2 using an enzyme-linked immunosorbent assay kit (RADIM SpA, Italy) in the department of Microbiology. The serum specimen was screened for HIV-1 and HIV-2 antibodies by the ELISA technique. Statistical analysis was performed using *t*-test, chi-square test and Fischer test, and referenced for *P*-values for their significance.

RESULTS

Out Of total 100 serum sample enrolled for the study. The age of the patients ranged from 17 to 42 years (mean 26.11 ± 4.27). The most common age groups were 20–25 years (45%), followed by 25–30 (36%), above 30 (14%) and below 20 (5%). In our study, seropositivity was maximum in the age group Above 30 years (14.29%), followed by 25–30 years (11.11%), 20–25 years (4.44%) and below 20 years (0%). [Table 1,2]. No any one sample is HIV Positive.

Table 1: Age of the participants

Age	Number	Percentage
Below 20	5	5
20-25	45	45
25-30	36	36
Above 30	14	14

Table 2: Correlation between HSV-2 serology with Age

Patient Characteristic	Total No. Of Patients	HSV-2 Serology	
		+	-
Below 20	5	0(0.00)	5 (100%)
20-25	45	2(4.44%)	43(95.56)
25-30	36	4(11.11)	32(88.89)
Above 30	14	2(14.29)	12(85.71)
Total	100	8(8%)	92(92%)

DISCUSSION

In recent years, genital herpes has become an increasing common sexually transmitted infection. From the late 1970s, HSV-2 seroprevalence has increased by 30%, resulting that one out of five adults is infected [4, 5]. HSV seroprevalence in patients with STD varies from 17% to 40% (6% in the general population and 14% in pregnant women) [6, 7]. Age and sex are important risk factors associated with the acquisition of genital HSV-2 infection. In fact, the prevalence of HSV infection rises with age, reaching the maximum around 40 years [4]. This infection appears related to the number of sexual partners, and regarding sex it is more frequent in women than in men [8, 9]. In addition, ethnicity, poverty, cocaine abuse, earlier onset of sexual activity, sexual behavior, and bacterial vaginosis can facilitate a woman's risk of infection before pregnancy [10, 11]. Regarding pregnant population, there is a high prevalence of genital herpes. Among Italian pregnant

women, the seroprevalence varies from 7.6% to 8.4% seroprevalence [9]. In contrast to our study, a much higher HSV-2 seroprevalence has been reported from various rural and urban populations from Africa (60–90% [11] and South and North America (30–70%). [12] This could be because of a higher prevalence of promiscuous sexual behavior, large number of sexual partners and high prevalence of other sexually transmitted infections in these communities. Rostamzadeh *et al.* [13] reported a seroprevalence of 63.1% in pregnant women whereas Cowan *et al.* reported a seroprevalence of 11.3% [14] and Mullick *et al.* reported a seroprevalence of 13.3%. [15] Prevalence in the general population in developing Asian countries appears to be lower (10–30%). [16] Maitra and Gupta [7] found a seroprevalence of 23.3% in a general gynecology clinic and Chawla *et al.* [8] reported a seroprevalence of 7% and 8.6% in two urban communities in Delhi. In our study, the HSV-2 seroprevalence rose steadily

with age (4.44% among women aged 20–25 years to 14.29% among women aged above 30 years). These findings are comparable to the studies of Breinig *et al.*[9] and Tideman *et al.*[4] No statistically significant correlation was observed with other demographic variables in our study, such as place of residence, whether rural or urban, education, annual family income, occupation and socioeconomic status. Similar findings were reported by Fleming *et al.*[12] However, Stavraký *et al.*,[2] Breinig *et al.*,[9], Cowan *et al.*[14] and Chawla *et al.*[8] found a significant association between HSV-2 seropositivity and sociodemographic factors while assessing the risk factors for HSV-2 infection in women. The effect of increasing number of previous pregnancies on seropositivity may not be direct but may be a reflection of increased duration of sexual activity, which itself is a risk factor for HSV seropositivity. Stavraký *et al.*,[2] observed that patients with multiple sex partners and increasing duration of sex activity and early age of sexual intercourse were at a higher risk of being seropositive to HSV-2. Our study failed to demonstrate an increased risk of seropositivity with early age of first intercourse. Breinig *et al.*[9] reported a positive association between seropositivity and previous history of abortions No statistically significant association of seropositivity to HSV-2 with respect to history suggestive of other sexually transmitted infections and HIV serology was seen in our study. Similar findings have been reported by Chawla *et al.*[8]

CONCLUSION

Genital herpes is a chronic condition that may be prevented. While the majority of HSV infections may not show any noticeable symptoms, those with clinical manifestations may lead to significant physical and psychological suffering. The clinical presentations are varied; thus, a suspected diagnosis of HSV should be verified with laboratory examinations. Management of genital herpes should be customized to the person and should include providing guidance on the diverse progression and look of lesions, educating about methods to avoid transmission, discussing the connection between HSV and HIV, and evaluating the psychological and sexual impacts of the illness. Antiviral therapy is a secure and efficient method for treating both occasional outbreaks and long-term suppression of HSV.

REFERENCES

1. Schneweis KE. Serological studies on the type differentiation of Herpesvirushominis. *Z ImmunExpTher.* 2012;124:24–48.
2. Stavraký KM, Rawls WE, Chiavetta J, Donner AP, Wanklin JM. Sexual and socioeconomic factors affecting the risk of past infections with herpes simplex type 2. *Am J Epidemiol.* 1983;118:109–21.
3. Roizman B, Carmichael LE, Dernhardt F, de-The G, Nahmias AJ, Plowright W et al. Herpesviridae: Definition, provisional nomenclature, and taxonomy:

- The Herpesvirus Study Group, the International Committee on Taxonomy of Viruses. *Intervirology.* 2011;16:201–17.
4. Tideman RL, Taylor J, Marks C, Seifert C, Berry G, Trudinger B, et al. Sexual and demographic risk factors for herpes simplex type 1 and 2 in women attending an antenatal clinic. *Sex Transm Infect.* 2001;77:413–5.
 5. Kasraeian M, Movaseghi M, Fotouhi Ghiam A. Seroepidemiological study of Herpes Simplex virus type 2 (HSV-2) antibody in Shiraz, Iran. *Iranian journal of immunology.* 2004;1(3):189–193.
 6. Howard M, Sellors JW, Jang D, Robinson NJ, Margaret F, Kaczorowski J, Chernesky M. Regional distribution of antibodies to herpes simplex virus type 1 (HSV-1) and HSV-2 in men and women in Ontario, Canada. *Journal of clinical microbiology.* 2003;41(1):84–89.
 7. Maitra N, Gupta M. Seroprevalence and correlates of herpes simplex virus type-2 infection in a general gynecology clinic. *Arch Gynecol Obstet.* 2007;275:19–23.
 8. Chawla R, Bhalla P, Singh MM, Garg S. Community-based study on seroprevalence of herpes simplex virus type 2 infection in New Delhi. *Indian J Med Microbiol.* 2008;26:34–9.
 9. Breinig MK, Kingsley LA, Armstrong JA, Freeman DJ, Ho M. Epidemiology of genital herpes in Pittsburgh: Serologic, sexual and racial correlates of apparent and inapparent herpes simplex infections. *J Infect Dis.* 1990;162:299–305.
 10. Lee FK, Coleman RM, Pereira L, Tatsuno M, Nahmias AG. Detection of herpes simple virus type 2- specific antibody with glycoprotein G. *J ClinMicrobiol.* 2015;22:641–4.
 11. Mihret W, Rinke de Wit TF, Petros B, Meckonnen Y, Tsegaye A, Wolday D et al. Herpes simplex virus type-2 seropositivity among urban adults in Africa: Results from two cross-sectional surveys in Addis Ababa, Ethiopia. *Sex Transm Dis.* 2002;29:175–81
 12. Fleming DT, McQuillan GM, Johnson RE, Nahmias AJ, Aral SO, Lee FK et al. Herpes simplex virus type 2 in the United States, 1976 to 2014. *N Engl J Med.* 1997; 337:1105–11.
 13. Rostamzadeh Khameneh Z, Sephehvand N, Taghizadeh-Afshari A, Motazakker M, Ghafari A, Masudi S. Seroprevalence of herpes simplex virus-2 in kidney transplant recipients: a single-center experience. *Iranian journal of kidney diseases.* 2010;4(2):158–161.
 14. Cowan FM. Testing for type specific antibody to herpes simplex virus- implications for clinical practice. *J Antimicrob Chemother.* 2000;45:9–13.
 15. Mullick S, Watson-Jones D, Beksinska M, Mabey D. Sexually transmitted infections in pregnancy: prevalence, impact on pregnancy outcomes, and approach to treatment in developing countries. *Sexually transmitted infections.* 2005;81(4):294–302.
 16. Weiss H. Epidemiology of herpes simplex virus type 2 infection in the developing world. *Herpes.* 2001; 11:24A–35A