



ORIGINAL ARTICLE

Seroprevalence of Herpes Simplex Virus HSV-1, CMV Antibody in Pregnant Women in a Prenatal Centers

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ABSTRACT

The aim of this study was to determine the seroprevalence of herpes simplex virus HSV-1 and CMV antibody in pregnant women attending to prenatal centers of Shahid Beheshti university of medical sciences during first six months of 2012. Blood samples from 176 women were taken to assess the seroprevalence of IgG antibodies against HSV-1, HSV-2 and CMV using a type-specific assay. Age, Marriage age, Occupation, Abortion, Blood transfusion history, orolabial Herpes history, HIV and Income status were recorded for each case. Data was analyzed by SPSS 20. $P < 0.05$ was considered statistically significant. The seroprevalence rates were 89.5% for HSV-1, 3.4% for HSV-2 and 78.4% for CMV. There was not significant relation between occupation, blood transfusion history, oral herpes history, and HIV with IgG seropositive rate. Only there was a significant relation between history of abortion and HSV-2 IgG seropositive rate. Compared to previous studies, our study results suggest a rise in the seroprevalence of CMV among pregnant women. The seroprevalence rates of HSV-1 was higher in our study in comparison with studies in other countries but seroprevalence rate of HSV-2 detected during pregnancy is consistent with other studies in other countries and in some cities in Iran. Also this study showed significant relation between history of abortion and HSV-2 IgG seropositive rate.

Keywords: Seroprevalence, herpes simplex virus HSV-1, CMV, IgG, pregnant women

Received 19/02/2014 Accepted 29/03/2014

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INTRODUCTION

CMV and HSV are all DNA viruses from the family of herpes Viridiae and the prevalence of their infections and diseases are variable in different people(1,2). According to Mendel's book, the seroprevalence of HSV1 in adult is more than 90 percent, and these measurements are different between different ages, socioeconomic levels and urban or rural areas. One of the important aspects of these common infections, are infections during pregnancy, as the major causes of morbidity and mortality in mothers and babies. Infection can spread to fetus through placenta, vaginal secretions, during delivery or lactation(3-7). Clinical presentations of infections are different among different children, and depend on age and type of virus. These viruses can induce congenital abnormalities, called TORCH including toxoplasmosis, others, rubella, CMV and herpes. The word others means several viruses as parvovirus, adenovirus and Enterovirus, HIV Measles, west Nile virus, β_1 . These viruses can make high mortality during pregnancy and CMV has high teratogenicity (8-10). Among these, HSV1 can make infections during the first 28 days after delivery. Among 90 percent prenatal infections, 70 % will become disseminated skin disease, 45 percent to local dermal or mucosal disease and 30 percent it will become meningitis and Encephalitis and 20 percent can induce hepatitis. The most common infection during pregnancy is CMV which is influencing 0.5 to 1.5 percent of births and will disseminate through saliva, urine and skin contacts. Sex, tissue transplant, placenta, lactation and rarely transfusion are possible ways for transmission the virus. CMV can induce primary infection, reactivation or recurrence during pregnancy (11-15). It can infect fetus through placenta and induce Intra uterine growth retardation, sensorineural deafness, intracranial calcification, microcephaly, hydrocephalia, hepatosplenomegaly and optic psychodermo atrophy (16). Vertical transmission is possible in every stages during pregnancy, however, sever complications are

more common in the first trimester. Ninety percent of CMV infections are asymptomatic and the other 10 percent will present the above sign and symptoms. Thirty percent of babies will die because of severe diseases and 50 percent will present neurological complications (17,18).

The most common complication of recurrent infections of CMV is neural deafness,

Varicella zoster virus is a common virus which can infect fetus during pregnancy. Primary infection with this virus during pregnancy, is a medical emergency, respiratory failure is more common during the third trimester and can make 14 percent mortality (19,20). It can induce abortion, Chorioretinitis, cataract, limb atrophy, cortical atrophy and neurological deficits, and spontaneous abortion in 0.8 to 3 percent of patients. Maternal infections during pregnancy, especially 5 days before and two days after the delivery, can make more severe diseases in babies with 30 percent mortality (21).

According to high prevalence and mortality caused by these infections, and their different seroprevalence in different pregnant women, and this fact that there are few studies about these infections in Iran, we have conducted a study about seroprevalence of common viruses in pregnant women in terms of age in previous pregnancies and history of blood transfusion.

MATERIAL AND METHODS

This is a description study on pregnant women referred to prenatal centers of ShahidBeheshti university of medical sciences in 1391. Data were collected by interview and observation. We have designed a questionnaire. Blood samples were taken with the full consent of the individuals. We have used ELISA in determining the type of Ab and the collected data were analyzed. This study is conducted between the first six months of 1391 to first six months of 1392. Blood samples were collected from 176 pregnant women referred to hospitals of ShahidBeheshti University of medical sciences. The women were asked about history of chickenpox, oral or genital herpes, and CMV infection. The difference between the mean ages of seronegative and seropositive women was analyzed with t-test. We have isolated serum in minus 30 centigrade and used X2 tests to analyze the differences between oral and genital herpes. Numbers of pregnancies were 0, 1 and two and the resident location was classified as urban and rural.

We have used odds ratio with CI=95 % to determine seroconversion and considered P value less than 0.05 as significant. We used SPSS 20 for statistical analysis. The mean age of women were 22-24 years old with average of one child. This study was conducted on the full consent of participants. We used special commercial kits of SERO company of USA in determining IgG Anti bodies against CMV and anti HSV-1 and 2.

RESULTS

We have studied 176 pregnant women referred to Hospitals of ShahidBeheshti University. The mean age of women were 24.22 ± 0.314 years old (minimum 17 and maximum 35). From them, 153 and 18 patients were seropositive and neative for HSV1 respectively. Also for HSV2, 6 patients were positive, 2 patients had borderline samples and 168 patients were negative. But for CMV, serologic tests were as follows: 138 patients positive, 3 patient borderline and 35 patients as negative. Table 1 is showing prevalence of CMV, HSV1 and HSV2 in pregnant women who were employed or housewife.

Table 1. Prevalence of CMV, HSV1 and HSV2 in pregnant women who were employed or housewife.

	Variable	Frequency (Housewives)	Frequency (employed)
HSV-1	Positive	90	63
	Borderline	0	0
	Negative	13	5
HSV-2	Positive	4	2
	Borderline	2	0
	Negative	100	68
CMV	Positive	86	52
	Borderline	3	0
	Negative	17	18

Table 2 shows frequency of cases with antibodies of CMV, HSV1 and 2 according to their frequency of marriages.

Table 2. Frequency of cases with antibodies of CMV, HSV1 and 2 according to their frequency of marriages.

	Marriage much	1	2	3
HSV1	Positive	133	19	1
	Borderline	0	0	0
	Negative	16	2	0
HSV2	Positive	5	1	0
	Borderline	1	1	0
	Negative	146	21	1
CMV	Positive	117	20	1
	Borderline	3	0	0
	Negative	32	3	0

Table 3 shows the frequency of antibodies of CMV, HSV1 and 2, in the serum of patients with a history of blood transfusion.

Table 3. The frequency of antibodies of CMV, HSV1 and 2, in the serum of patients with a history of blood transfusion.

	Variable	Frequency (no)	Frequency (yes)
HSV-1	Positive	148	5
	Borderline	0	0
	Negative	17	1
HSV-2	Positive	6	0
	Borderline	1	1
	Negative	163	5
CMV	Positive	134	4
	Borderline	3	0
	Negative	33	2

Frequency of lip herpes in pregnant women according to serologic antibodies of HSV1 and HSV2 are shown in table 4.

Table 4. Frequency of lip herpes in pregnant women according to serologic antibodies of HSV1 and HSV2.

	Variable (history of lip herpes)	Frequency (no)	Frequency (yes)	Frequency (more than one time)
HSV-1	Positive	91	61	1
	Borderline	0	0	0
	Negative	11	7	0
HSV-2	Positive	5	1	0
	Borderline	0	2	0
	Negative	99	68	1

We can see in table 5 about the history of abortion and serologic results of HSV1:

Table 5. The history of abortion and serologic results of HSV1:

	Variable	Frequency (no)	Frequency (yes)
HSV-1	Positive	146	7
	Negative	16	2

There were no significant relationship between abortion and serologic results of HSV1.

History of abortion and serologic results are shown in table 6.

Table 6. History of abortion and serologic results

	Variable	Frequency (no)	Frequency (yes)
HSV-2	Positive	6	0
	Negative	160	8
	Borderline	1	1

It is observed that there is a significant relationship between frequency of abortion and serologic results of HSV2.

Table 7 is showing the relationship between history of abortion and serologic results of CMV.

Table 7. The relationship between history of abortion and serologic results of CMV

	Variable	Frequency (no)	Frequency (yes)
CMV	Positive	130	8
	Negative	34	1
	Borderline	3	0

According to the findings in this table, no significant relationship was seen between history of abortion and serologic results of CMV.

Significant relationship was not seen between women's jobs and serological prevalence of antibodies to HSV1, HSV2 & CMV. And also there were no significant relationship between HSV1 and HSV2 and HIV serology results. Between family income and serological results of HSV1, HSV2 CMV no significant correlation detected.

DISCUSSION

In this study, 176 pregnant women who referred to prenatal care centers of Shahid Beheshti University of Medical Sciences with an average age of 24 years were studied. Seroepidemiology positive value, including 89.5% for HSV-1 virus, 3.4% for HSV-2 and 78.4% for CMV virus. It should be noted that because of the lack of available test kits for measuring serum antibody against VZV at the time of the study, the percentage of Seroepidemiology of the virus in population didn't measure [22,23].

Our results about HSV1 were more than other studies all over the world, but about the HSV2, our results were similar to the results of the study conducted between 1989 to 2000 in 8 European countries. In that study, the seroprevalence of HSV-1 were as: in Finland 52%, the Netherlands 57%, Belgium 67%, and 24% in Bulgaria and in 81% Slovakia. However, the seroprevalence of HSV-2 in Bulgaria was 24% in Germany, 14% in Finland, 13% in Belgium, 11%, 9% in the Netherlands, Czech, Slovakia 6% and the UK 4%, respectively., but in this study the epidemiology of this virus served in males and females measured [22].

In another study in 1383 conducted on 65 pregnant women in Kermanshah about seroprevalence of HSV-1 it was reported in 55.4% of the population, which again is lower than our study [23]. But, in another study in Tehran about seroepidemiological prevalence of antibody against HSV-1 over 25 years it is reported in 80% of people, roughly similar to our study [24]. It should be noted that the seroprevalence of antibodies against the virus in different studies conducted in our research as age increases.

The prevalence of serum antibodies of virus, HSV-2, was more in Western countries than our country. For example, in a German study on 200 pregnant women, seroprevalence of antibodies against the virus, HSV-2 in pregnant women under 15 years, was 7/2%, 7/4% in 18-16 years 3/7% and in older ages it was 6/13% [27].

In our study, the seroprevalence of CMV antibody showed large differences with various studies carried out in other parts of the world including our country, for example, in a study on 257 pregnant women in Kermanshah about the seroprevalence of CMV, it was 23% lower in our study. However, in another study in Kazeroon, CMV seroprevalence in 1472 pregnant women was 97.69%, more than the value of our research. The frequency of CMV virus in a seroepidemiological study, was 51.5% (28), in Israel, 87.4% in India and (29) 98.9% in Nigeria on 94 pregnant women (31) the seroepidemiological differences in various countries, including our own country could possibly be caused by the following reasons:

- 1 - The difference of specific climatic characteristics of the region together
- 2 - Density of population in developing countries and poor
- 3 - Health levels lower in these areas than in more advanced countries.

The study also found that the percentage of positive Seroepidemiology for all types of viruses HSV-1, HSV-2 and CMV in housewives and employed women were more but this result was not significant statistically.

The study also found that the history of abortion is not significantly associated with HSV-2, HSV-1 and CMV serology results. The study also found that HSV-1 and HSV-2 serology results are not also significantly associated with HIV, parity, history of blood transfusion, and the herpes of the lip (for HSV-1 and HSV-2).

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Citation of this article

Farideh S, Fateme S A, Saeid Z, Rezvan B, Bahareh H, Leili C. Seroprevalence of Herpes Simplex Virus HSV-1, CMV Antibody in Pregnant Women in a Prenatal Centers. *Bull. Env. Pharmacol. Life Sci., Vol 3 (5) April 2014: 14-18*