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EXISTENCE OF HERPES SIMPLEX VIRUS INFECTIONS IN PREGNANT WOMEN

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ABSTRACT

This study was conducted to determine the prevalence of herpes simplex virus infection among pregnant women and to investigate different parameters associated with this infection. Ninety six serum samples were collected from three different hospitals in Khartoum state during December 2012 to February 2013. Samples were collected according to data taken from pregnant women; they were grouped according to age, stages of pregnancy, number of deliveries, education level and the pervious history of abortion. These 96 samples were tested for detection of IgM and IgG antibodies using ELISA. Out of 96, IgM was detected in 10 samples (10.4%) while IgG was found in 88 (91.7%) of samples. The association of Herpes simplex virus infection and different parameters was analyzed and discussed.

Key words: Herpes simplex virus, pregnancy, Women

INTRODUCTION

Herpes simplex virus type 2 (HSV-2) is sexually transmitted and known to cause most genital herpes. Clinically infection is generally described as genital herpes [1]. Herpes simplex -2 virus belong to the family *Herpes viridae*, subfamily *Alphaherpes virinae*, genus *Simplex virus* [2]. Various symptoms of herpes simplex virus infection are reported such as tingling sensation in the buttocks, genitalia, and thighs, vaginal discharge, watery

blisters in the skin or mucous membrane of the mouth, lips or genitals, lesions heal with a characteristic scab of herpetic disease [3].

Transmission of herpes simplex virus -2 is mainly through contact with an infected skin during reactivations of the virus. It can be transmitted during latency and is primarily a sexually transmitted infection and can be transmitted vertically during childbirth [4]. In Sudan, variable results indicating the existence of herpes simplex virus infection are noticed, however very scares work on this viral infection have been published. This study is intended to investigate the existence of herpes simplex virus IgG and IgM in pregnant women as well as to its association with the prominent clinical signs of the disease.

MATERIAL AND METHODS

Time and Location of Study:

Descriptive cross sectional community base survey was conducted in three different hospitals in Khartoum State during December 2012 to February 2013 to estimate the prevalence of Herpes simplex type 2among pregnant women.

Samples and data collection:

A total of 100 samples were collected from pregnant women at different stages of pregnancy from three different hospitals.

This work has been approved by the Ethical Committee of the Tropical Medicine

Research Institute. Participated women had filled a questionnaire and a written consent was obtained from all of them. Participants were categorized in groups according to the age, number of pregnancy, stage of pregnancy, education level and history of previous abortion, data were statistically analyzed using SPSS software programme.

Five ml of blood without anti coagulant were drawn from each participant under aseptic conditions, using sterile disposable vacutainer tube, and left to clot at room temperature. Each blood sample was then centrifuged at 1500 rpm for 5 minutes, then the serum was separated in another sterile plain container. Samples were labeled. Serum samples were kept frozen at -20ºC**.**

Detection of herpes simplex virus antibodies:

Serum samples were tested for the detection of herpes simplex virus-2 IgG and IgM antibodies using Enzyme Link Immune Sorbent assay (ELISA). The kits were obtained from Adaltis S.r.I, Milano, Italy, tests were run according to the instructions of the manufacturer.

RESULTS

Prevalence of HSV-2 IgM and IgG antibodies among pregnant women at different age groups:

Among pregnant women the overall IgM positive reactors were found to be 10 out of 96 (10.4%). The overall IgG positive reactors were found to be 88 out of 96 (91.7%).The highest positivity of IgM and IgG (9.3% and 98.4%, respectively) were seen among the productive age group (26-35 years) than others groups (Table 1). However statistically there was no significant difference (P value 1.000, P value 0.525) between the groups.

Detection of HSV-2 IgM and IgG antibodies in the different stages of pregnancy:

The prevalence of IgM antibodies was found to be higher in the 2nd trimester of pregnancy (13.8%), while IgG was higher in the 1st trimester (96.6%); however there was no statistically significant difference or relationship between the prevalence of the disease and the stages of pregnancy (p value: 0.676, P value 0.164). The details are shown in Table (2).

Determination of HSV-2 IgM and IgG Antibodies according to the number of deliveries:

The prevalence of HSV-2IgM antibodies was slightly higher in the pregnant women who have less than 5 deliveries while IgG was higher in the group of more than 5 deliveries. Statistically there was no significant difference (P value 0.978, P value 0.607) between the two groups (Table 3).

Prevalence of HSV-2 IgM and IgG Antibodies according to the education level:

The study showed that IgM and IgG antibodies were slightly higher in the uneducated group of pregnant women; however there was no association between the spread of HSV-2 and the education level among the pregnant women. Statistically there was no significant difference (P value 0.786, P value 0.301) between the groups (Table 4).

Prevalence of HSV-2 IgM Antibodies with regard to previous history of abortion:

The prevalence of IgM and IgG antibodies against HSV-2 was found to be higher in non aborted group (13.3%, 96.7%), than in the group those who have previous history of abortion. Statistically there was no significant difference (p value 0.533, P value 0.036) between the two groups (Table 5).

Table (1) Prevalence of IgG and IgM antibodies detected by ELISA in pregnant women according to different age groups at three different hospitals in Khartoum state

Age groups	IgG			IgM		
	Total tested sera	No of positive sera	% positivity	Total tested sera	No of positive sera	%positivity
15-25	16	13	81.3%	16	2	12.5%
26-35	64	63	98.4%	64	6	9.3%
36-45	16	12	75%	16	2	12.5%
Total	96	88	91.7%	96	10	10.4%

Table (2) Detection of HSV-2 IgG and IgM antibodies in pregnant women sera collected during different stages of pregnancy at different hospitals of Khartoum state

Duration of pregnancy	IgG			IgM		
	Total tested sera	No of positive sera	% positivity	Total tested sera	No of positive sera	%positivity
1st trimester	30	29	96.6%	30	2	6.6%
2nd trimester	36	33	91.6%	36	5	13.8%
3rd trimester	30	26	86.6%	30	3	10%

Table (3) Variation of IgG and IgM antibodies in pregnant women sera according to the number of deliveries

No of deliveries	IgG			IgM		
	Total tested sera	No of positive sera	% positivity	Total tested sera	No of positive sera	%positivity
Less than5	58	53	91.3%	53	6	11.3%
More than 5	38	35	92.1%	38	4	10.5%

Table (4) Results of HSV-2 IgG and IgM antibodies in pregnant women sera with different educational levels

Educational level of the pregnant women	IgG			IgM		
	Total tested sera	No of positive sera	% positivity	Total tested sera	No of the positive sera	%positivity
Uneducated	16	16	100%	16	2	12.5%
Low	21	19	90.5%	21	1	4.7%
Medium	32	29	90.6%	32	4	12.5%
High	27	24	88.9%	27	3	11.1%

Table (5) Comparison between the results of HSV-2 IgG and IgM antibodies detection in pregnant women with regard to the previous history of abortion

History of abortion	IgG			IgM		
	Total tested sera	No of positive sera	% positivity	Total tested sera	No of positive sera	%positivity
Aborted women	66	59	89.4%	66	6	9.1%
Non aborted women	30	29	96.7%	30	4	13.3%

DISCUSSION

In This study 10.3% of the tested pregnant women sera were found to be positive for the presence of IgM antibodies to HSV-2 which may indicate a primary infection or reactivation of a latent virus and that agree with a previous report [5] who stated that specific IgM antibodies appear after primary infection and may be detectable during recurrent infections. 15% positivity for HSV IgM in patients showing clinical disease was detected in India [6]. In Sudan 7% seroprevalence of HSV IgM was detected in pregnant women [7], 2% in Khartoum [8]. and 2.% in other study where all IgG positives were also IgM

positive [9]. However, 34.6% of 45 tested women positive for Herpes virus IgG was found but none of them were positive for IgM [10].

In this study 91.7% of tested pregnant women sera were found to be positive for IgG antibodies which reflects the existence of the disease in Sudan for may be a long time ago this may be supported by the previous studies in Sudan which reported a 95% of HSV IgG in schizophrenic patients [11], in pregnant women, 88% [9] and 63% [8]. The presence of IgG antibodies may indicates previous, asymptomatic or latent infection; in this case the individual can transmit the disease. This is in line with [12] who reported that infected person with herpes simplex virus-2 produces specific IgG antibodies detectable for life and capable to transmit the virus to others.

Concerning the prevalence of IgG antibodies among age groups, the study found that the result of IgG was high (98.4%) in the productive age (26 - 35).Very similar results were recently reported in Sudan [7] and India [13]. Statistically in this work there was no significant difference between the different age groups, which may weaken the relationship between the different age groups and the infection of the virus. This observation was previously reported in Sudan [8] and Ghana [14].

In the current work also higher prevalence of IgG antibodies were found to be in the first trimester and IgM in the 2nd, respectively. Similar results were reported in Sudan [8] and India [13]. Statistically there was no significant difference between the different stages of pregnancy and the infection with the virus. In spite of that the presence of IgM in pregnant women especially in the 3rd trimester means that the virus is active and the baby may become infected with herpes virus at the time of delivery. This agrees with a previous comment [15] that the risk of transmission of HSV-2 to the neonate is low in women with a history of genital herpes but is increased in pregnant women developing a primary infection in the third trimester.

In this study the number of deliveries of the examined pregnant women also was put into consideration. The result showed that there was no statistically significant difference between the number of the deliveries of the pregnant women and the infection with the virus.

In this work the education level of the examined pregnant women was put into consideration. The results showed that there was no statistically significant difference between the different

educational level of the pregnant women and the infection with the virus.

Regarding the previous history of abortion among the tested pregnant women and its relationship with the disease, the study found that the positive percentage for IgG and IgM antibodies to HSV-2 was slightly higher in the pregnant women who had no previous history of abortion. The same observation was reported in Sudan (Idress and Wafa, 2015).

It was concluded in the study that HSV infection is of wide spread among women of different age in Sudan, detailed study to characterize the virus and to investigate its epidemiology is highly recommended.

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