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Prevalence of IgM and IgG Against Herpes Simplex Virus (HSVI, II) in the serum of abortion women in Diyala province

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Abstract

Herpes simplex virus descends from the Herpesviridae family, that includes spherical viruses whose range is 120-200 nm. Herpes simplex viruses are divided into two types: HSV-1 and HSV-2. These viruses produce life-long illnesses and are one of the most frequent viral infections globally. The major cause of genital herpes is the infection with Herpes simplex virus type 2 (HSV2). It is extremely widespread in human populations in many parts of the world and is the main reason for genital ulcer diseases globally. The probable involvement of HSV2 in promoting HIV transmission is a critical public health concern in poor nations. This study was done at Al-Batol Hospitals in Diyala governorate during January to June 2023. Its aim was to evaluate the frequency of IgM and IgG against HSV in the serum of aborting females.

The research included 90 women whose age range is 19 to 42 years. 38 (42.22%) of the aborted women were from the urban areas, while 52 (57.77%) resided in rural regions. The result for HSV I IgG antibody among abortion women was 83 (92%) out of the 90, while 7 (8%) out of 90 were negative. Additionally, out of the 90 samples,1 (1%) were positive of HSV I IgM antibody, whereas 89 (99%) were negative. Also, the result for HSV II IgG antibody among females having an abortion was 2 (2%) out of the 90. Still, 88 (98%) out of 90 were negative. In addition, of all samples, 1(1%) were positive for HSV II IgM antibody, and 89 (99%) were negative.

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1. INTRODUCTION

Herpes simplex virus descends from the Herpesviridae family, that includes spherical viruses with an approximate diameter 120-200 nm. Herpes simplex virus type 1 and type 2 (HSV-1 and HSV-2) are the two kinds. These viruses are among the most common infections resulted from viruses worldwide, causing lifelong illnesses [1],[2].The major cause of genital herpes is the infection with Herpes simplex virus type 2 (HSV2). It is extremely widespread in humans in many regions of the world and is the main reason for genital ulcer diseases globally. The principal public health significance of HSV2 in underdeveloped countries is it possible aids in HIV transmission [3].HSV2 is very widespread in most HIV-infected locations, with infection rates climbing dramatically with age to more than 70 percent amongst adult women and men in several African nations. Genital ulcer illness raises the infection of HIV-positive patients and the susceptibility of HIV-negative ones, and clinical studies have demonstrated that HSV2 infection affects the genital HIV shedding. The reciprocal impact of the HIV immune suppression of HSV2 symptom worsening suggests a positive feedback loop, with HIV increasing HSV2 expression, which may increase HIV infectiousness and transmission [3],[4].

Herpes viruses and humans have most likely been in contact for over 100,000 years. Many features of herpes virus infections were studied in recent decades, from severe infections to moderate or subclinical symptoms. Herpes virus reactivation has been linked to a variety of illnesses ranging from transplant-organ problems to immune regulatory changes in the elderly [1].Traditionally, herpes virus simple symptoms in the rural area are well reported. A substantial percentage of people may experience labial lesions and, in certain cases, stomatitis at some point in their lives. These lip lesions are usually self-limiting; however, they are frequently recurring. Other herpes viruses were also identified as emerging pathogens in the pathogenesis of many disorders. Human herpes viruses are members of the Herpesviridae family, and once infected, they remain in the body of the person infected (latency) for the rest of their lives. Those viruses lead to a wide range of disorders, and while infections are mostly benign, they can induce clinical symptoms with varying degrees of severity in immunocompromised persons [4],[5].

The Herpesviridae family is split into three subfamilies: Alphaherpesvirinae (a-herpesvirinae), Betaherpesvirinae (B-herpesvirinae), and Gammaherpesvirinae(yherpesvirinae). These are differentiated by their viral and structural properties, and their pathogenic potential. Most viruses in this family are double-stranded DNA viruses, and many herpes viruses have comparable structural properties [6].

2- MATERIALS AND METHODS

Study design

This research was done at Al-Batol Hospitals in Diyala governorate during January to June 2023 and aimed to determine the prevalence of IgM and IgG Against HSV in the serum of abortion women.

Sample collection

About 4-5 milliliters of venous blood from 90 abortion women were withdrawn from all participants and have been put in a serum sort or gel tube (SST). The blood in gel tube was left for 20 minutes at room temperature. In subsequent coagulation, Sera was isolated by centrifugation at 4000 x 15 minutes and blood serum was stored at -20 C.

Procedure of Assay

- Step 1: If the specimen and test reagents are refrigerated or frozen, bring them to room temperature. After the material has been thawed, thoroughly mix it before completing the experiment.
- Step 2: When you're prepared to test the gadget, unzip the pouch at the notch and remove it. Place the testing instrument on a hygienic, level surface.
- Step 3: Label the apparatus with the ID number of the specimen.
- Step 4: Fill the capillary tube up to the specimen line, as indicated in the photographs. The specimen has a volume of around 10 L. Transfer the specimen with a pipette to deliver a volume of 10 L for greater accuracy. Holding the capillary tube upright, distribute the entire specimen in the middle of the sample well, ensuring there are no air bubbles. Add 2 drops (approximately 60-80 L) of sample diluents to the sample well instantly, with the container placed vertically.
- Step 5: The timer should be set up.
- Step 6**:**The finding sought to be read at 10 mins . Positive results may be apparent in as little as one minute. Negative findings ought only to be maintained at the end of the 15 minutes. Any findings read other than the 10–15-minute timeframe should be deemed invalid and redone. After evaluating the results, discard the used devices in accordance with local device disposal regulations.

Interpreting the Assay Result

1. NEGATIVE RESULT:

If just the C line appears, the test suggests that there are no anti-HSV antibodies in the samples. The outcome is negative or inactive.

2. POSITIVE RESULT:

2.1: As to the existence of the C line, the existence of anti-HSV IgG is indicated if only the G line develops. The end outcome is anti-HSV IgG positivity or reactivity.

2.2: If just the M line appears, the test confirms the existence of anti-HSV IgM. The outcome is anti-HSV IgM positivity or reactivity.

2.3: Besides the C line, the test confirms that there is an anti-HSV IgG and IgM, if both the G and M lines develop. Consequently, anti-HSV IgG and IgM antibodies are either positive or reactive.

Statistical Analysis:
The Statistical Analysis System - SPSS program was used to determine the influence of various factors on the research.

3- RESULT
The study group involved 90 women, with a mean age of 19 – 42 years old, thirty eight(42.22%) of the aborted women were from urban areas, while fifty two (57.77%) from the rural regions as in table (1).

Table 1:- baseline details of participants

Variables	Frequency	Percentage
Age		
less than 20	4	4.44%
2-29	46	51.11%
30-40	33	36.66%
More than 40	7	7.77%
Residence		
Urban	38	42.22%
Rural	52	57.77%
Total	90	100%

The result in table (2) shows that the prevalence of HSV I IgG antibody among abortion women was 83 (92%) out of the whole study sample and 7 (8%) were negative.
Additionally, 1 (1%) were positive for HSV I IgM antibody and 89 (99%) were negative.

Table (2) show the prevalence of HSV- I IgG and IgM in abortion women's

Parameter	Positive	Negative	Total
HSV I IgG	83(92%)	7(8%)	90(100%)
HSV I IgM	1(1%)	89(99%)	90(100%)

Similarly, the results in table (3) show that HSVII IgG antibody among females having abortion was 2(2%) and88(98%) were negative. Additionally, 1(1%) were positive for HSVII IgM antibody and 89(99%) negative .

Table (3) HSV II IgG and IgM in abortion women.

Parameter	Positive	Negative	Total
HSVII IgG	2(2%)	88(98%)	90(100%)
HSV II IgM	1(1%)	89(99%)	90(100%)

According to table 4, the effect of age on HSV I IgG and IgM was as follows. The age group (20-29) was more affected by this virus and was 42 (46.66%) followed by the (30-40) age group at 33 (36.66%) positive with the HSV I IgG and HSV I IgM prevalence. Those who are 20-29 were IgM antibody positive with no significant differences in all cases.

Table (4) effect the Age on HSV I IgG and IgM.

AGE GROUPS	HSV-I IgG		Total	HSV- I IgM		Total
	Positive	Negative		Positive	Negative	
Less than 20	3(3.33%)	1(1.11%)	4(4.44%)	0(0%)	4(4.44%)	4(4.44%)
20-29	42(46.66%)	4(4.44%)	46(51.11%)	1(1.11%)	45(51.11%)	46(51.11)%)
30-40	33(36.66%)	0(0%)	33(36.66%)	0(0%)	33(36.66%)	33(36.66%)
More than 40	5(5.55%)	2(2.22%)	7(7.77%)	0(0%)	7(7.77%)	7(7.77%)
Total	83(92%)	7(8%)	90(100%)	1(1.11)	89(98.88%)	90(100%)
P value	0.05(NS)			0.05(NS)		

Similarly, table 5 also showed the effect age on HSV II IgG and IgM. The age group (20-29) was IgG antibody positive 2 (2.22%). Yet, in the HSV II IgM prevalence, the age group (30-40) was IgM antibody positive 1 (1.11%) without significant differences in all cases.

Table (5) effect the Age on HSV II IgG and IgM.

AGE GROUPS	HSV-II IgG		Total	HSV-II IgM		Total
	Positive	Negative		Positive	Negative	
Less than 20	0(0%)	4(4.44%)	4(4.44%)	0(0%)	4(4.44%)	4(4.44%)
20-29	2(2.22%)	44(48.88%)	46(51.11)%)	0(0%)	46(51.11%)	46(51.11%)
30-40	0(0%)	33(36.66%)	33(36.66%)	1(1.11%)	32(35.55%)	33(36.66%)
More than 40	0(0%)	7(7.77%)	7(7.77%)	0(0%)	7(7.77%)	7(7.77%)
Total	2(2%)	88(98%)	90(100%)	1(1%)	89(99%)	90(100%)
P value	0.05(NS)			0.05(NS)		

Table 6 revealed the effect residence on HSV I IgG and IgM prevalence. The rural area was more influenced by this virus 50 (55.55%) than the urban area 33 (36.66%) with positive HSV I IgG. Yet, in the HSV I IgM prevalence, the rural area was all IgM antibody positive 1 (1.11%) without any significant differences in all cases.

Table (6) effect the residence on HSV I IgG and IgM prevalence.

Residency	HSV-I IgG		Total	HSV- I IgM		Total
	Positive	Negative		Positive	Negative	
Urban	33(36.66%)	5(5.55%)	38(42.22%)	0(0%)	38(42.22%)	38(42.22%)
Rural	50(55.55%)	2(2.22%)	52(57.77%)	1(1.11%)	51(56.66%)	52(57.77%)
Total	83(92 %)	7(8%)	90(100%)	1(1.11)	89(98.88%)	90(100%)
P value	0.05(NS)			0.05(NS)		

In table 7, the result indicated the effect of the residence on HSVII IgG and IgM prevalence. All the IgG and IgM antibody positive from abortion woman were from the rural area 2 (2.22%) and 1 (1.11%) respectively showing no significant difference in all cases.

Table (7) effect the Age on HSV-II IgG and IgM prevalence.

AGE GROUPS	HSV-II IgG		Total	HSV-II IgM		Total
	Positive	Negative		Positive	Negative	
Urban	0(0%)	38(42.22%)	38(42.22%)	0	38(42.22%)	38(42.22%)
Rural	2(2.22%)	50(55.55%)	52(57.77%)	1(1.11%)	51(56.66%)	52(57.77%)
Total	2(2%)	88(98%)	90(100%)	1(1.11)	89(98.88%)	90(100%)
P value	0.05(NS)			0.05(NS)		

DISCUSSION

Infection with Herpes simplex type 2 during pregnancy can lead to abortion, preterm labor, and congenital and neonatal herpes. One of the disease control program's top tasks is to collect reliable epidemiologic data through seroprevalence investigations [7],[8]. The current study revealed that 83 (92%) of the abortion females in Diyala province had anti-herpes simplex -1 IgG and 1 (1%) anti-herpes simplex -I IgM. These findings of high positive cases in anti-herpes simplex -1 IgG agree with [9] and [10] . That the pervasiveness of genital HSV infection has recently increased in both developed and developing countries, and that the main factors ascribed to this propagation of HSV include asymptomatic virus shedding and undiagnosed disease. The antibody IgM is generally not useful compared to IgG because the IgM antibody that comes up early in the infection and goes away when IgG appears. In addition, IgM can not accurately distinguish herpes simplex virus from other herpes viruses [11]-[13]. Yet, in this study, the positive IgM is important in the diagnosis of 56.6% positive cases because the infection could be diagnosed early with this antibody. Positives to both Ig Mand IgG specific for HSV are referred to as early phase of infection. In addition, there was only one positive case of IgM which represented the initial infection as well as IgG positive cases representing the chronic infection with HSV. It occurs most frequently during the first 3 months after a primary infection [11]-[13]. Also, the current research revealed that the anti- herpes simplex -II IgG in abortion women in Diyala was 2 (2%) and anti- herpes simplex -I IgM 1 (1%).

Various investigations found varying outcomes. In Saudi Arabia, 0.5% of pregnant women showed detectable levels of HSV-2 IgM antibodies [14]. Anti-HSV-2 IgM antibodies were identified in 11.3% of 130 pregnant females in Turkey [15]. The current study contradicted other Iraqi researchers [16] , according to whom, 28.9% of pregnant females have anti-HSV-2 IgM antibodies. Moreover, the findings revealed that the seroprevalence of HSV-2 infection was not substantially related to age or residence. These results are consistent with certain studies [17]. And disagrees with other [13]. A significant number of the examined women (80.8%) tested positive for IgG against HSV-1. This observation is consistent with the global prevalence of HSV [18] and with what is known in Saudi Arabia [19]. The second study found a significant incidence of HSV-1 (62.25-97%) and a very low prevalence of HSV-2 (0.24-2.3%) in several KSA regions. Yet, there was no information on HSV-1 or HSV-2 in Taif. At the same time, just a small proportion (8/761, or 1.1%) of the examined women had IgM antibodies against HSV-1 [20], [21].

CONCLUSIONS

We concluded the Infection with Herpes simplex type 2 during pregnancy can lead to abortion, preterm labor, and congenital and neonatal herpes. The current study revealed that 83 (92%) of the abortion females in Diyala province had anti-herpes simplex -1 IgG and 1 (1%) anti-herpes simplex -I IgM.

RECOMMENDATION

This study recommended including HSV IgM and IgG for any women suffering from repeated abortion.

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