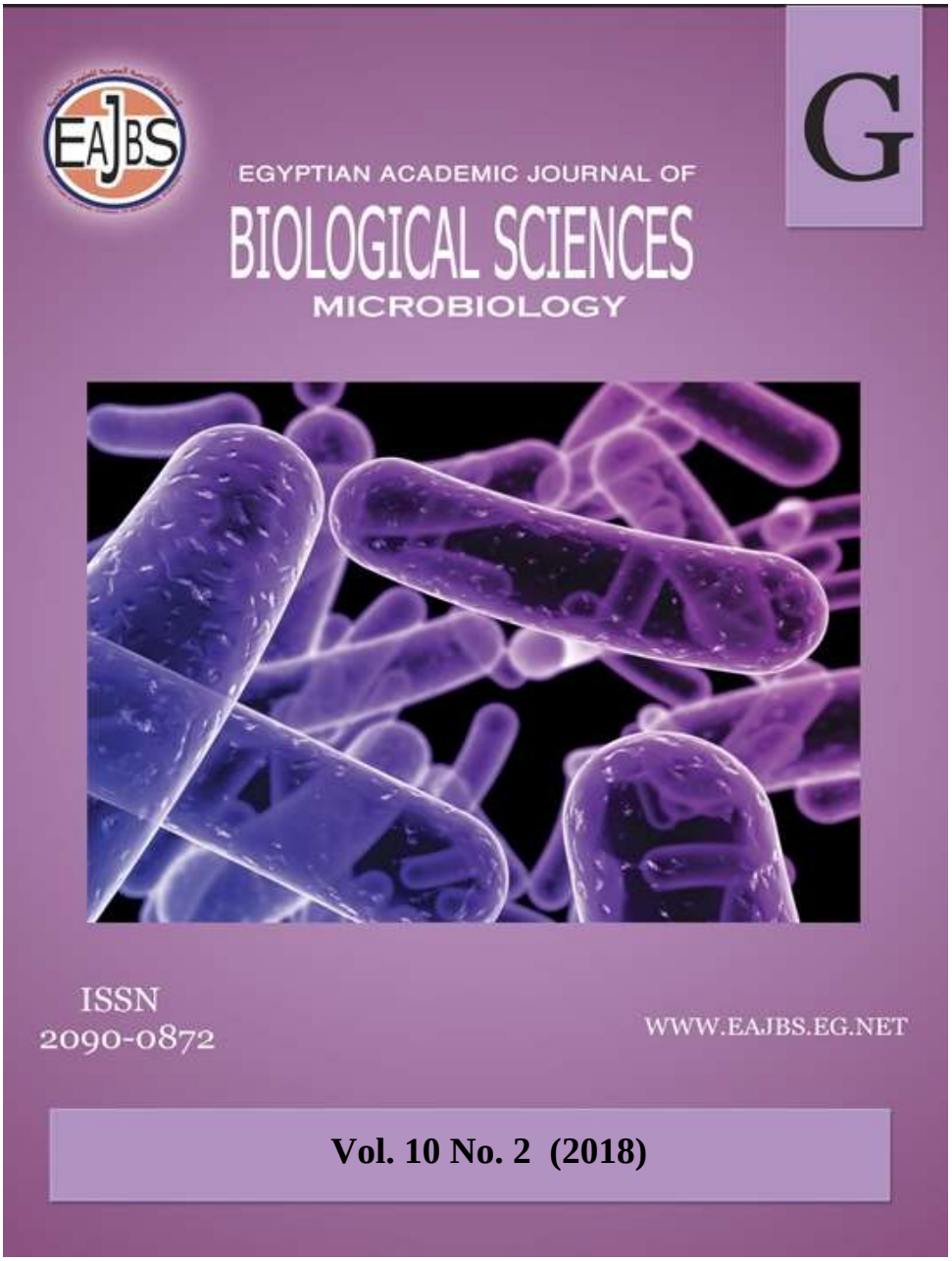

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Serologic Study for TORCH Infection in Women with Bad Obstetric History in Al-Anbar Province (IRAQ)

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ABSTRACT

Background: TORCH infections, are a medical abbreviation for a set of perinatal infections that are passed from a pregnant woman to her fetus, they are one of the essential causes of Bad obstetric history (BOH). The best identification of TORCH can be done with serological tests by using rapid test and ELISA.

Patients and Methods: A total of 300 women with BOH were enrolled in this study, rapid test and ELISA technique were applied to detect of TORCH infections in study group beside 30 women as the control group.

Results: The age group was ranging between 18-42 years, the highest percentage of IgG was specific for HSV-1 and Rubella virus which were 57.9% and 54.6% respectively, the highest percentage of IgM was specific for Rubella virus and Toxoplasma which was 2% for both of which. The positive seroprevalence for TORCH infection was 89% of the study group. The frequency of abortion was the highest between the other BOH classes 57.3%, followed by early neonatal death 14%, Intrauterine death 7% and 6% for congenital anomalies. The results also showed that there were no significant differences between the results of ELISA technique and rapid test to the IgG and IgM for all items of Torch infection

Conclusions: The most frequent age was between 25-30, the highest decrease in levels of anti-TORCH IgM and increase the percentage of different anti-TORCH IgG which results in highly increasing in positive seroprevalence for THORC infection. The recent rapid tests are very specific and their result is similar to the results of automated ELISA. In aborted women, Intrauterine death, congenital anomalies the highest infection was with CMV

INTRODUCTION

Bad obstetric history (BOH) implies pregnancy outcomes in terms of two or more repeated spontaneous abortions, history of intrauterine fetal death, intrauterine growth retardation, still births, early neonatal death and/or congenital anomalies. BOH may be caused by hormonal, abnormal maternal immune response, genetic and maternal infection(1)

TORCH infections are a medical acronym for a set of perinatal infections that are passed from a pregnant woman to her fetus. The TORCH infections can lead to severe fetal anomalies or even fetal loss.

They are a group of viral, bacterial, and protozoan infections that gain access to the fetal bloodstream transplacentally via the chorionic villi. Hematogenous transmission may occur at any time during gestation or occasionally at the time of delivery via maternal-to-fetal transfusion (2)

TORCH includes Toxoplasmosis, Rubella, Cytomegalovirus (CMV), Herpes infections and Other infections (syphilis, varicella-zoster, parvovirus B19, Hepatitis B) are some of the most common infections associated with congenital anomalies (3). The degree of severity is dependent on the gestational age at the time of infection, virulence of the organism, damage to the placenta and the severity of the maternal disease (4). Since these maternal infections are initially asymptomatic and as the clinical diagnoses are unreliable, the diagnoses of these infections depend on serological evidence. Many sensitive and specific tests are available for serological diagnosis of TORCH complex.

The detection of the IgM, IgG antibody against TORCH is the best approach for the identification of these infections by dipstick and ELISA (4,5).The prevalence of TORCH infections differs according to the geographical region (6,7), the highest figures of stillbirth were reported in southeast Asia and Sub-Saharan Africa (8)

The current study was planned to evaluate both IgG and IgM levels on a large sample size to recognize the predominant and recurrent TORCH infections due to the lack of a national screening program, limited data could be collected, also this study intended to compare between rapid and ELISA techniques for determining TORCH IgG,IgM

MATERIALS AND METHODS

Patients and Methods: The study was carried out during the period (October 2016-April 2018). The study population was women attending to the private gynecologic and obstetric clinic, they were selected by the physician. A total of 300 sera samples were collected from those populations. Aseptically collected blood sample from the study subjects were kept at room temperature for 20 minutes. After clotting, the clot was withdrawn and centrifuged. Sera were separated and stored at − 20oC until tested. Determination of Immunoglobulin (IgG and IgM) against TORCH was done by two techniques using commercially available TORCH rapid test and ELISA kit (Union, USA) following the manufactures instruction.

Results compiled, tabulated and analyzed using Pearson's chi-square test Differences were considered to be significant at p-value < 0.05. All calculations will be done through SPSS (Statistical Package for Social Sciences). All patients included in the investigation gave written informed consent. The present study was approved by the Ethics in Research Committee of Anbar University.

RESULTS

In this study the mean age of included women was 27.287± 5.94. The maximal age was 42 years and the minimum value was 18 years

Table No.1 shows that the highest percentage of IgG was specific for HSV-1 and Rubella virus which were 57.9% and 54.6% respectively, the lowest percentage was specific to HSV-2 which was 5.6%. The highest concentration of IgG was for CMV which was 7.91while the lowest concentration was 5.1 which was recorded for HSV-2.

Table 1: The percentage of positive results, range and mean of IgG's concentrations for anti -Torch antibodies

IGG	Positive No.		Range	Minimum	Maximum	Mean	Std. Deviation
RUB	16	54.6%	5.82	1.03	6.85	2.8496	1.39213
CMV	75	25%	6.91	1.00	7.91	3.7028	1.49802
TOXO	35	11.6%	4.84	1.37	6.21	3.5049	1.33986
HSV1	172	57.3%	6.01	1.09	7.10	3.2854	1.43038
HSV2	17	5.6%	4.12	.98	5.10	2.1435	1.28713

Table 2 shows that the highest percentage of IgM was specific for Rubella virus and Toxoplasma which was 2% for both of which and the highest concentration of IgM was found in TOXO, while the lowest concentration was recorded in HSV2

Table 2 : The percentage , range and mean of IgM' concentrations for anti–Torch antibodies

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
RUB	6	1.6017	.39792	.16245	1.1841	2.0193	1.04	2.02
CMV	3	1.5300	.51740	.29872	.2447	2.8153	1.09	2.10
TOXO	6	2.7300	1.50301	.61360	1.1527	4.3073	1.06	4.99
HSV1	5	2.9760	1.42521	.63737	1.2064	4.7456	1.07	4.62
HSV2	4	1.1450	.18303	.09152	.8538	1.4362	.99	1.38
Total	24	2.0850	1.20097	.24515	1.5779	2.5921	.99	4.99

Table 3: Shows high variance between each of IgG and IgM for all Torch infection as shown below. The results also showed that there were significant and non-significant differences between controls and study group according to the different infection as shown in the following Table.

Table 3: The comparison between IgG and IgM for TORCH infections

State	Rub GG	Rub IGM	CMV IGG	CMV IGM	Toxo IGG	Toxo IGM	HSV-1 IGG	HSV-1 IGM	HSV-2 IGG	HSV-2 IGM
Total No.	304	304	304	304	304	304	304	304	304	304
Positive No.	166	6	75	3	36	6	176	5	17	4
Percentage	54.6	2.0	24.7	1.0	11.8	2.0	57.9	1.6	5.6	1.3

Table 4: Comparison between study group and control group that give a positive result for each of IgG and IgM specific for Torch infections.

	Rub IGG	**Rub IGM**	**CMV IGG**	**CMV IGM**	**Toxo IGG**	**Toxo IGM**	**HSV-1 IGG**	**HSV-1 IGM**	**HSV-2 IGG**	**HSV-2 IGM**
Study gr. percentage	**54.6**	**2**	**24.7**	**1.0**	**11.8**	**2.0**	**57.9**	**1.6**	**5.6**	**1.3**
Control. percentage	**76**	**0**	**13.3**	**0**	**16.6**	**0**	**63.3**	**0**	**6.6**	**0**
St. devia	**1.3879**	**0.9**	**0.043**	**1.4**	**0.140**	**0.9**	**1.03**	**1.02**	**0.23**	**1.34**

The results also showed that there were no significant differences between the results of ELISA technique and rapid test to the IgG and IgM for all items of Torch infection as shown in the following table

Table 5: comparison between the results of ELISA and rapid tests

	Rub IGG	**Rub IGM**	**CMV IGG**	**CMV IGM**	**Toxo IGG**	**Toxo IGM**	**HSV-1 IGG**	**HSV-1 IGM**	**HSV-2 IGG**	**HSV-2 IGM**
(+ve) by ELISA	**54.6**	**2**	**24.7**	**1.0**	**11.8**	**2.0**	**57.9**	**1.6**	**5.6**	**1.3**
(+ve) by rapid test	55%	2.8	25	1.0	13	2.2	66	2.6	7.8	1.5

Finally, the results showed that the frequency of abortion was the highest between the other BOH classes 57.3%, followed by early neonatal death 14%, Intrauterine death 7% and 6% for congenital anomalies as shown in table-6.

Table 6: Frequency of positive TORCH according to types of BOH presentations

BOH	No./%	Toxo		Rubella		CMV		HSV-1		HSV-2	
		IgG	IgM	IgG	IgM	IgG	IgM	IgG	IgM	IgG	IgM
Abortion	172	**14**	**5**	**100**	**1**	**25**	**3**	**94**	**2**	**5**	**3**
	57.30%	**8.10%**	**2.9**	**58.1**	**0.58**	**14.5**	**2.3**	**54.6**	**1.16**	**2.9**	**1.74**
Intra-uterine death	21	**4**	**0**	**9**	**0**	**11**	**0**	**16**	**0**	**2**	**1**
	7%	**19.04**	**0**	**42.8**	**0**	**52.3**	**0**	**76**	**0**	**9.5**	**4.76**
Preterm labor	28	**5**	**1**	**15**	**1**	**13**	**0**	**17**	**1**	**3**	**0**
	9.30%	**17.8**	**3.57**	**53.5**	**3.57**	**36.4**	**0**	**60.7**	**3.57**	**10.7**	**0**
Early neonatal death	42	**6**	**0**	**23**	**1**	**7**	**0**	**24**	**0**	**4**	**0**
	14%	**13.04**	**0**	**50**	**2.17**	**15.2**	**0**	**52.1**	**0**	**8.69**	**0**
Congenital anamolies	18	**3**	**0**	**8**	**0**	**7**	**0**	**13**	**1**	**1**	**0**
	6%	**16.66**	**0**	**44.4**	**0**	**38.8**	**0**	**72.2**	**5.55**	**5.55**	**0**
portion and congenital anamoli	19	**3**	**0**	**9**	**0**	**12**	**0**	**8**	**0**	**2**	**0**
	6.30%	**15.7**	**0**	**47.36**	**0**	**63.1**	**0**	**42.1**	**0**	**10.5**	**0**
Total	300	**35**	**6**	**164**	**6**	**75**	**3**	**172**	**5**	**17**	**4**
	100%	11.66	2.00%	54.66	2.00%	25	1.00%	57.33	1.66	5.66	1.33

DISCUSSION

The ages of the study group were ranged between 18-42 years which is the age of reproduction, the most frequent age was between 25-30 as mentioned in many previous studies (9). When Immune system exposes to any infection, at first it produces IgM which persists for three months then, after a second exposure it produces IgG which remains for a lifetime, this study was designed to detect each of specific IgG and specific IgM to differentiate between current and previous infections. High percentage of anti-Rubella IgG 167/300 is due to the vaccination with RA 27/3 strain, which induces long-lasting immunity, as an antibody response is detectable for >20 years in 95% of patients (10) and anti-HSV-1 IgG 172/300 is due to the high prevalence of HSV-1 infection which increases progressively from childhood, the seroprevalence being inversely related to socioeconomic background (11). The frequency is decreased gradually for CMV 75/300, Toxo 35/300 and the lest for the HSV-2 17/300. We can observe the decrease in the level of Toxoplasma gondii infection from 45.55% in 2012 (12) and 30.7% in 2013(13) until to reach 11.6% in this study. CMV was recorded in 73.7% of aborted women in Baghdad 2015 (14), while Anwari showed that 4.1% of aborted women were positive for anti CMV IgG between 2015-2016(15).

This study showed that the concentrations of anti-TORCH IgG were fairly close, and anti CMV IgG was the highest one. The comparison of concentration with other studies is difficult because of the variation in methods of measurement and reagents used.

Out of 300 women with BOH, The highest rate 172(57.3%) were aborted and lowest for congenital anomalies (6%) this point is similar in many local and global studies and the other cases rates ranging between them (1,16). In aborted women, Intrauterine death, congenital anomalies the highest infection was with CMV, this result was fairly close to the results summarized in a review done by Alsamaraii 2013(17) and followed by toxoplasmosis.

In the study group of this research, the positive seroprevalence was found in 89%, higher seroprevalences were noted in Germany (82%)(18), Turkey (63.1%) (19), Zimbabwe (51.1%) (20), and Iran (43.75%) (21)

According to the anti- TORCH IgM the levels were very low ranged between (1-2)%, 1%,1.6%,1.7% and 2% for CMV,HSV-2, HSV-1 and both Rubella & Toxo respectively. We can spot to the highest decrease in levels of anti-TORCH IgM which refers to recent infections, this result may be explained by the increase the health awareness and treatment of the previous infection completely.

This study also showed no significant differences between the percentage of infection by using each of rapid test cassette (CTK Biotech-U.S.A) and chemilumi-

nescence immunoassay. The converged results of two methods can be clarified by many factors; one of which is the high sensitivity and specificity of rapid test to be similar to the more confirm techniques like ELISA and chemilumin-escence immunoassay. The accumulated experience to do these type of tests and to read the results by lab technician.

The sero-positivity in women with BOH is high 89% and fairly close to the sero-positivity in healthy women 80%. This situation can be clarified by the prominence or high rate of anti Rub and anti HSV-1antibodies 76%, 63.3%, and the reduction in the rate of most new TORCH infection represented by anti TORCH IgM.

This study was designed to provide updating data about TORCH infection in women with BOH in AL-Anbar province and commend to search for the other real causatives of abortion and BOH in the area of study

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