TOURCH INFECTIONS IN MOTHERS WITH BOD AS A CAUSE OF NEONATAL MISCARRIAGES AND FETAL MALFORMATION IN DUHOK PROVINCE, KURDISTAN REGION/ IRAQ

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Abstract:

This study was performed to demonstrate the effect of TORCH agents on pregnancy outcome of 84 mothers with BOD, the number of single, twice, triple, four and more miscarriages were 102 (55.4%), 50 (27.2%), 27 (14.7%) and 5 (2.7%), respectively.

Out of 102 BOH pregnant women with single miscarriage, 43 (42.2%) and 2 (4.9%) were seropositive for anti *T. gondii* IgG and IgM, respectively, 89 (87.3%) and 17 (16.7) were seropositive for anti CMV IgG and IgM, respectively, 63 (61.8%) and 3 (2.9%) were seropositive for anti Rubella IgG and IgM, respectively and 63(61.8%) and 14(13.7) were seropositive for HSV-2 IgG and IgM, respectively.

Regarding women with twice miscarriage, 1 (2.0%), 14 (28.0%) were seropositive for *T. gondii* anti IgG and IgM, respectively, 16 (8.0%), 43 (86.0%) were seropositive for CMV anti IgG and IgM, 29(58.0%), respectively. The IgG of anti Rubella was recorded in 29 (58.0%) no any case for anti IgM. and 29 (58%) and 3 (6.0%) were positive for HSV-2 anti IgG and IgM, respectively. The number of cases with triple miscarriages, 8 (11.1%) were seropositive for anti *T. gondii* IgG antibodies, while no any case was found against IgM antibodies. Only, 3 (4.2%), 22 (30.6%) were seropositive for anti CMV IgG and IgM respectively. The seropositivity of anti *Rubella*, anti HSV-2 IgG and IgM antibodies in group with triple miscarriages were recorded in 12 (16.7%), 10 (13.9%), 0 (0.0%) and 3 (4.2%) respectively. The number of cases with four and more miscarriages, all (100%) were seropositive for CMV anti IgG and IgM, and one (20%) for *T. gondii* anti IgG and IgM, while 2 (40%) and 4 (80%),were seropositive for anti Rubella and anti HSV-2 IgG, respectively. Also the results indicated that 134 (72.8%) of all examined pregnant women with BOH have history of miscarriages,14 (7.6%) congenital malformation, 13 (7.1%) intrauterine growth retardation,10 (5.4%) premature labor and 13 (7.1%) still birth. with the predominant of anti CMV IgG and IgM antibodies

Keywords: *Women with BOD, TOURCH, Pregnancy outcome*

Introduction

The TORCH complex is a medical acronym for a set of primary or prenatal infections (i.e. infections that are passed from a pregnant woman to her fetus), the TORCH infections can lead to severe fetal anomalies or even fetal loss (Newton, 1999). TOURCH are a group of viral, bacterial, and protozoan infections that gain access to the fetal bloodstream transplacentally via the chorionic villi, they include *Toxoplasma. gondii*, Others(Syphilis, Hepatitis B, Varicella- zoster viruses), Rubella , CMV, and HSV-2 (Lewis, 2007).

These diseases are not particularly serious for adults who are exposed and treated, but women when are affected with any of these diseases during pregnancy are at risk for miscarriage, still birth, or for having a child with serious birth defects and /or illness. Thus, TORCH test is performed before or as soon as pregnancy is diagnosed to determine the mother's history of exposure to these microorganisms (Gomella, 1994).

Bad obstetric history (BOH) implies to previous unfavorable fetal outcome in terms of two or more consecutive spontaneous miscarriage, history of intrauterine fetal death, intrauterine growth retardation, stillbirth, early neonatal death and/or congenital anomalies. The cause of BOH may be genetic, hormonal, abnormal maternal immune response, and maternal infection (Morton *et al.,* 1987).

The prevalence of these infections varies from one geographical area to another (Stern *et al.,* 1996). These maternal infections are initially unapparent or asymptomatic and are, thus, difficult to diagnose on clinical aspects (Abdel-Fattah et *al.,* 2005).

Therefore, diagnosis of acute TORCH infection in pregnant women is usually established by demonstration of seropositivity of specific immunoglobulins (IgM and IgG) in sera (Abbas, 2002). Enzyme-Linked Immuno Sorbent

Assay (ELISA) for IgM antibodies against these infections is highly sensitive and specific (Mladina *et al.,* 2002). The conventional single serum assays do not make a clear distinction between a recent primary and chronic infection, the tendency of specific IgM to persist for a long time even at high levels has been verified in several studies, while IgG antibodies remain detectable for a lifetime, providing immunity and preventing or reducing the severity of reinfection (Wegmann *et al.,* 1993,Denkers and Gazzinelli ,1998 and Frey,1999).

Thus, if IgM antibodies are present in a pregnant woman, a recent infection with the organism has occurred, but if only IgG antibodies are present and do not demonstrate an increase on serial testing several weeks later, it can be assumed that the person has had a previous infection by the organisms (Marzi *et al.,*1996). If the serum of a person has no evidence of either IgM or IgG antibodies specific for the organisms, then the person is at risk of infection if exposed because they do not have any demonstrable immunity (Shirahata *et al.,* 1992).

The current study was undertaken to demonstrate the levels of anti IgG and IgM against TORCH infections using ELISA in groups of pregnant women with BOD and the outcome of pregnancy.

Materials and Methods

During the period from September to November 2012, a total of 184 pregnant women with bad obstetric history(BOD), having a single, twice, triple fourth and more miscarriages as indicated in table (1) who attended the antenatal clinic, obstetrics and gynecology department of Azadi Teaching Hospital in Duhok City, General Amedi Hospital and antenatal clinic in Sheladieza, Deroluak, Sersaing and Kadash towns BOH, such as miscarriage, intrauterine growth retardation , still birth , premature labor and congenital malformation. The data are collected using a special questionnaire including the number of pregnancies, previous miscarriages, history of fetal abnormalities, and stage of pregnancy.

Table 1: Distribution of miscarriage among examined pregnant women with bad obstetric history (n=184)

No. of abortions	No. of examined women	%
Once	102	55.4
Twice	50	27.2
Triple	27	14.7
Fourth and more	5	2.7
Total	184	100

Blood Collection

From each woman of BOH 5 ml of blood sample was withdrawn and the serum was separated for the detection of IgM and IgG antibodies for TORCH infection. The blood was taken by a disposable syringe, transferred to disposable test tube and allowed to clot, then the blood was centrifuged at 3000 rpm for about 5 minutes, the separated serum was aspirated and poured into a sterile eppendorf tube (1ml). Each tube was labeled and numbered before being stored in a deep freezer at -20 ^{o}C until the time of analysis. Blood samples collected from distant areas were kept in a cool box until reaching the laboratory. The present work was performed in the laboratory of serology and virology department / General Amedi Hospital.

All serum samples were screened for the presence of IgM and IgG antibodies for *T.gondii,* Rubella virus, Cytomegalovirus (CMV) and Herpessimplex virus type 2(HSV-2) using Enzyme Linked Immuno Sorbent Assay (ELISA). All ELISA kits were obtained from BioCheck, Inc./ (Germany). The procedure was performed according to the manufacturer instructions of the company.

Statistical Analysis

Statistical analysis of the results was performed using SPSS software (16 version) program and the Chi-square test and Fisher' s exact test were used to compare proportions and *t* test for comparison between the means of two groups, a *p* value of < 0.05 considered significant.

Results

Out of 184 women with BOD (table. 2), 102(55.4%) were with single miscarriage, 50(27.7%) with twice,27(14.7%) with triple and 5(2.7%) with four or more miscarriages. Regarding the types of antibodies, the highest seroprevalence of antibodies were with anti CMV IgG and IgM antibodies in all cases of miscarriages, as they were found in 89(87%) and 17(16.7%), 43(86.0%) and 8(16%), 22(30.6%) and 3(4,.2%) and 5(100%) and 1(20%) in single, twice, triple, fourth and more miscarriages, respectively. Regarding other TORCH agents in one miscarriage, antibodies were recorded at lower rates such as 63 (61.8%) and 3 (2.9%) were seropositive for anti Rubella IgG and IgM, respectively and 63 (61.8%) and 14 (13.7%) for ant HSV-2 IgG and IgM, respectively, and 43 (42.2%) and 5(4.9%) were seropositive for anti *T. gondii* IgG and IgM, respectively.

Regarding those with twice miscarriages, as indicated earlier, the highest seroprevalence was with anti CMV IgG and IgM antibodies, since they were recorded in 43 (86.0%), 8 (16.0%) cases, respectively. Anti Rubella IgG *antibodies* were recorded in 29 (58.0%) cases with no any cases with anti IgM antibodies. With respect to anti HSV-2 IgG and IgM antibodies, 29 (58.0%) and 3 (6.0%) were seropositive, respectively and 14 (28.0), 1 (2.0%) were seropositive for anti *T. gondii* IgG and IgM, respectively,

The number of cases with triple miscarriages was 27 cases, from these cases 22 (30.6%) and 3 (4.2%) were seropositive for anti CMV IgG and IgM, respectively, The seropositivity of anti Rubella, anti HSV-2 IgG and IgM antibodies were recorded in 12 (16.7%) ,0 (0.0%),10 (13.9%) and 3 (4.2%), respectively, and 8 (11.1%) were seropositive for anti *T. gondii* IgG antibodies, while no any case was found against IgM antibodies,

While the number of cases with four or more miscarriages was only 5 cases, all 5(100%) were seropositive for anti CMV IgG antibodies and one (20.0%) was serpositive for anti IgM, 4 (80%) and 2 (40%) were serpositive for anti Rubella IgG and anti HSV-2 antibodies, respectively, while no cases for anti IgM antibodies of the same pathogens were reported. and one case (20.0%)for anti *T. gondii* , IgG antibodies respectively. The differences were not significant.

Table 2: Seropositivity of TORCH infections among women with BOH and their relation to the number of miscarriages (n=184)

TORCH agents	Type of Immunoglobulin	Number miscarriages								Statistics			
		Once		Twice		Triple		Four and more		Test	*df*	*P* value	Sig.
		n=102	55.4%	n=50	%27.2	n=27	14.7%	n=5	2.7%				
Toxoplasmai	IgG	43	42.2	14	28.0	8	11.1	1	20.0	Fisher's Exact Test		0.275	
	IgM	5	4.9	1	2.0	0	0.0	0	0.0	Fisher's Exact Test		0.665	
CMV	IgG	89	87.3	43	86.0	22	30.6	5	100.0	Fisher's Exact Test		0.799	
	IgM	17	16.7	8	16.0	3	4.2	1	20.0	Fisher's Exact Test		0.845	
Rubella virus	IgG	63	61.8	29	58.0	12	16.7	4	80.0	Fisher's Exact Test		0.340	
	IgM	3	2.9	0	0.0	0	0.0	0	0.0	Fisher's Exact Test		0.748	
HSV-2	IgG	63	61.8	29	58.0	10	13.9	2	40.0	Fisher's Exact Test		0.110	
	IgM	14	13.7	3	6.0	3	4.2	0	0.0	Fisher's Exact Test		0.513	

It is obvious from table (3) that 134 (72.8%) of examined pregnant women with BOD had a history of miscarriage, 14 (7.6%) had a history of congenital malformation, 13 (7.1%) with intrauterine growth retardation, 10 (5.4%) with premature labor and 13 (7.1%) with still birth.

Table 3: Distribution of abnormalities among examined pregnant women with BOD (n=184)

Miscarriage & Abnormalities	**No. of examined women**	**%**
Miscarriage	134	72.8
Congenital Malformation	14	7.6
Intrauterine growth retardation	13	7.1
Premature labor	10	5.4
Still birth	13	7.1
Total	184	100

Regarding the seropositivity of TORCH infections among women with BOH in relation to types of bad history are shown in table(4). As it is clear from the table that the most predominant agent in all cases of BOD were anti CMV IgG and IgM antibodies except in miscarriage in which the IgM for HSV-2 was the highest as they were occurred in 17 (12.7%) of the cases(table. 4).

Statistical analysis indicated that the results of CMV IgM and HSV- 2 IgG were statistically significant ($P < 0.05$) as compared with other agents of TORCH infections.

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Table 4: Seropositivity of TORCH infections among women with BOH and their relation to types of bad history (n=184)

TORCH	Type of immunoglobulin	Types of bad history										Statistics		
		Miscarriage		Congenital Malformation		Intrauterine growth retardation		Premature labor		still birth		Test value	*df*	*P* value
		n=134	72.8%	n=14	7.6%	n=13	7.1%	n=10	5.4%	n=13	7.1%			
Toxoplasma	IgG	44	32.8	9	64.3	4	30.8	3	30.0	6	46.2	Fisher's Exact Test	4	0.175
	IgM	5	3.7	0	0.0	0	0.0	1	10.0	0	0.0	Fisher's Exact Test	4	0.586
CMV	IgG	112	83.6	13	92.9	13	100.0	9	90.0	12	92.3	Fisher's Exact Test	4	0.574
	IgM	15	11.2	6	42.9	4	30.8	1	10.0	3	23.1	Fisher's Exact Test	4	0.011
Rubella virus	IgG	78	58.2	10	71.4	8	61.5	7	70.0	5	38.5	Chi-Square (3.715)	4	0.446
	IgM	2	1.5	0	0.0	1	7.7	0	0.0	0	0.0	Fisher's Exact Test	4	0.494
HSV-2	IgG	75	56.0	10	71.4	11	84.6	5	50.0	3	23.1	Chi-Square (11.548)	4	0.021
	IgM	17	12.7	3	21.4	0	0.0	0	0.0	0	0.0	Fisher's Exact Test	4	0.223

*****CMV IgM = significant ($p<0.05$) *HSV-2 IgG = significant ($p<0.05$)

Discussion

TORCH screening is routinely preferred by physicians for detecting the infection among women during pregnancy period. The physicians concentrate on women with previous cases of BOH such as miscarriages and other types of congenital abnormalities, and many researchers have studied the maternal infections of the fetus which play an important role in miscarriage and congenital abnormality cases (Abdel-Fattah,2005; Denoj *et al.,*2008; Goncalves *et al.,* 2010; Al-Hindi *et al.,* 2010 ; Jasim *et al.,* 2011; Vilibic-Cavlek *et al.,* 2011).

In TORCH infections the infected pregnant woman produce two types of specific antibodies against each infective pathogen, these are IgG and IgM antibodies and measuring the titers of these antibodies in the sera can identify the type of infection (Frey, 1999).The present study involved the screening of IgG and IgM antibodies of TORCH infections in the sera of the pregnant women of BOD using ELISA, due to the effectiveness of this test in the diagnosis and estimation of the past and the recent infections with all of these agents(Gomella, 1994).

The study showed different rates of TORCH agents among examined women with BOH, and regarding their effects, miscarriage was the main complications of TORCH infections, as it occurred at a rate of 72.8 % out of the total cases (184) this is in accordance with other studies performed in Iraq by Abdul-Mohymen *et al.*(2009) ; Al-Taie(2010); Hadi (2011), and Zhang and Cheng(2012).

This study also showed that all enrolled women with BOH were suffering from single or mixed infections with TORCH agents, and all of them either have had one, two, or more miscarriages(table.3). This is in agreement with the results reported in many previous studies in Iraq, such as Abdul-Mohymen *et al.*(2009), Al-Taie (2010) and Jasim *et al* . (2011), in which they found that 64.6, 38 and 54% percentage of miscarriages, respectively. The reason for high occurrence of miscarriages in the screening cases may be due to the development of immunity against TORCH agents (Golalipour *et al.,*2009).

The result of the present study showed high rates of anti CMV (16.7%) and HSV-2 (13.7%) IgM antibodies, probably these dominant agents caused miscarriage among studied cases followed by *T. gondii* infection with infection rate of 4.9%.This is in agreement with what was reported by Jasim *et al* .(2011) in Iraq which they found high seropositivity of CMV (60.2%), HSV-2 (73.9%), and *T. gondii* (54%) IgM antibodies among miscarriage women; smilarly Thongchai *et al*. (1997), in Thailand found high seropositivity of CMV 100%, HSV-2 79-81% and 13-15 % for *T.gondii* IgM antibodies among miscarriage women.

On the other hand, present results disagrees with those mentioned by Vilibic *et al.(*2011) in Croatia which found low prevalence of anti CMV(0.09%), 1.2% for HSV-2 and 0.25% for *T. gondii* , IgM antibodies

Based on the presence of specific IgG antibodies in reactivation cases, also CMV (87.3%), *Rubella* (61.8%) and HSV-2 (61.8%) infections were the main causative agents of miscarriage when compared with *T.gondii* infection (42.2%). lower and higher seroprevalence with these agents have been reported in some studies such as Sadik *et al.*(2012) in India who found 20.93% for *T.gondii* IgG , 29.06% for *Rubella* IgG, 23.25% for CMV IgG and 18.6% for HSV-2 IgG and Nabi *et al.* (2012) in Bangladesh in which they found that 95.49 % for CMV IgG antibodies , 81.08% for *Rubella* IgG, 23.42% for *T. gondii* and 87.39% for HSV-2 IgG. This variation might be due to many factors such as sample size and life style of population (Golalipour *et al.,*2009).

The current study, the highest infections rates 20 (10.87%) was found with CMV infections, , followed by HSV-2 infections 13 (7.07%) and the lowest rates were for *T .gondii* 4 (2.17%) and *Rubella* 2 (1.09%), followed by 3 seropositive cases for anti *T. gondii* and anti CMV IgM antibodies .These results were in agreement with the results of Denoj *et al.* (2008) in India in which they observed cross infections with more than one of the TORCH agents among studied women (40.8%) positive against any one of TORCH agents, multiple positivity observed against two pathogens in (31%), (8.5%) against three pathogens, and (5.6%) infected with all the four pathogens (Denoj *et al.* 2008).The reason of different and similar seropositivity of TORCH infections in pregnant women from area to area might be due to the hygienic habits, culture differences related to feeding habits, education level, primary health care program and early diagnosis of infections.

Due to high seropositivity of TORCH infections in pregnant women with BOH,

therefore preventive measures should be considered. and all pregnant women with BOH should be routinely screened for the TORCH infections for early diagnosis, proper management treatment in order to prevent complications such as fetal abnormalities and death.

References

Abbas, M. M. (2002). Seroepidemiological study on Toxoplasmosis among women with history of abortion. M.Sc thesis. College of Medicine, AI-Nahrain University, Iraq.

Abdel-Fattah, S.A.; Bhat ,A., Illanes, S.; Bartha, J.L, Carrington, D .(2005). "TORCH test for fetal medicine indications: only *CMV* is necessary in the United Kingdom". Prenat. Diagn., 25 (11): 1028–1031.

Abdul-Mohymen, N.; Amal, H.; Farouk, K. (2009).Association between TORCH agents and recurrent spontaneous abortion in Baghdad. IRAQI J. MED. SCI., 7 (4):40-46.

AI-Hindi, A.; AI-Helou, T.; AL-Helou, Y.(2010). Seroprevalence of *Toxoplasma gondii,* Cytomegalovirus, Rubella virus and *Chlamydia trachmatis* among infertile women attending in vitro fertilization center, Gaza strip, Palestine, J. Egypt Soc. Parasitol., 40(2): 451-8.

Al - Taie, A. (2010). Serological Study For TORCH Infections In Women With High Delivery Risk Factors In Mosul. Tikrit Journal of Pure Science, Vol.15(1): 193 -198.

Denkers, E. Y.and Gazzinelli, R. T.(1998). Regulation and function of T-cell-mediated immunity during *T. gondii* infection. Clin. Microbiol. Rev., 11: 569–588.

Denoj Sebastian, K. F.; Zuhara , K. ;Sekaran.N. (2008).Influence of TORCH infections in first trimester miscarriage in the Malabar region of Kerala. African Journal of Microbiology Research, (2):056-059.

Frey, R. J.(1999). TORCH Tests. Gale Encyclopedia of Medicine. 1st Edition. Gale Research Group.

Golalipour, M.J; Khodabakhshi, B. and Ghaemi, E .(2009).Possible role of TORCH agents in congenital malformations in Gorgan, northern Islamic Republic of Iran. La Revue de la Mediterranee orientale, Vol.15 (2): 330 - 336 (Abstract).

Gomella, T.L.(1994). Infectious Diseases: TORCH Infections. In Neonatology: Management, Procedures, On-Call Problems, Diseases and Drugs, Norwalk, CT: Appleton & Lange.

Goncalves, M.A.; Matos, C.B.; Spegiorin, L.C.; Oliani, D.C.; Mattos, L.A. (2010). Seropositivity rate for Toxoplasmosis, Rubella, Cytomegalovirus, Hepatitis and HIV among pregnant women receiving care at a public health service, Sao Paulo state, Brazil, Braz. J. Infect. Dis., 14(6):601-605.

Kadir, M.A. ;Ghalib, A.K, Othman, N.F.(2007). The significance of modified Latex agglutination with 2- Mercapto-Ethanol(2ME) test in differentiation between acute and chronic toxoplasmosis.Assiut.Med.J.,31(1):1-6.

Hadi, N. J. (2011).Prevalence of Antibodies of Cytomegalovirus, Rubella Virua and *Toxoplasma gondii* among aborted women in Thiqar province, Iraq. Tikrit Medical Journal. Vol. 17 (4): 3-9 .

Jasim, M; Hadeel, A; Ali, I. (2011). Performance of Serological Diagnosis of TORCH Agents in Aborted versus non aborted Women of Waset province in Iraq. Tikrit Medical Journal; 17(2):141-147

Lewis, R. A.(2007). Torch screen , Columbia University Pediatric Faculty Practice, NY. Review provided by Veri Med Healthcare Network.

Marzi, M.; Vigano, A.; Tabattoni, D.; Villa, M. L; Salvaggio, A. (1996). Characterization of type 1 and type 2 cytokine profile in physio-logic and pathologic human pregnancy. Clin. Exp. Immunol., 106: 127-133.

Mladina, N.; Mehikic, G.; Pasic,k. (2002).TORCH infections in mothers as a cause of neonatal morbidity. A. Med Arh.54(5-6):273-276.

Mohammed, J, Hadee,l A, Ali, I. (2011). Performance of Serological Dignosis of TORCH Agents in Aborted versus non aborted Women of Waset province in Iraq. Tikrit Medical Journal, 17(2):141-147.

Morton, N. E; Chiu, D.; Holland ,C.; Jacob, P. A. and Pettay, D.(1987). Chromosome anomalies as predictors of recurrent risk for spontaneous abortion. Am. J. Med. Genet., 28:353– 360.

Nabi, S.N; Wasey, A.F.; HaiderKhan, A.A.; Hoque, M. M.(2012). Seroprevalene of TORCH Antibody in Pregnant Women in Bangladesh. JAFMC Bangladesh Vol 8(1): 35 - 39.

Newton, E.(1999).Diagnosis of perinatal TORCH infections, Clin. Obstet. Gynecol., 42:59-70.

Rajendra, B. S.; Usha, P.; Kamlakar, R.K.; Khadse, M.S.; QaziSuresh, V. j. (2006). Serological study for TORCH infections in women with bad obstetric history in Nagpur. India , J. Obstet. Gynecol. India, 56(1) :41-43.

Sadik, M.S.; Fatima, H.; Jamil, K.; Patil, C. (2012). Study of TORCH profile in patients with bad obstetric history .India, Biology and Medicine, 4 (2): 95-101.

Shirahata, T.;Muroyo ,N.; Ohta, C.; Goto, H. and Nakane, A.(1992). Correlation between increased susceptibility to primary *T.gondii* infection and depressed production of gamma interferon in pregnant mice. Microbiol. Immunol., 36: 81-91.

Stern, J. J; Cerrillo, M.; Dorfmann, A. D; Coulam, C. B . and Gutierrez-Najar, A. J. (1996). Frequency of abnormal karyotypes among abortuses from women with and without a history of recurrent spontaneous abortion. Fertil .Steril., 65:250 –3.

Thant KZ.(2006). Active surveillance for congenital rubella syndrome in Yangon, Myanmar. Bulletin of the World Health Organization, 84:1–80.

Thongchai, T.; Ruengpung, S.; Louisirirotchanakul. S.; Puthavathana, P. and Chantapong, W. (1997).Immune Status in Congenital Infections by TORCH Agents in Pregnant Thais. Thailand, Asian pacific Journal of allergy and Immunology, 15 : 93-97.

Vilibic –Cavlek ,T.; Ljubin-Sternak, S.; Ban ,M.; Kolaric, B.; Sviben, M.; Mlinaric-Galinovic, G.(2011). Seroprevalence of TORCH infections in women of childbearing age in Croatia. J. Matern. Fetal Neonatal Med.,Vol, (2):280-3.

Wegmann, T. G.; Lin, H.; Guilbert, L. and Mosmann, T. R.(1993). Bidirectional cytokine interactions in the maternal–fetal relationship: is successful pregnancy a Th2 phenomenon. Immunol. Today, 14:353–356.

Zhang ,Q.Q.; Cheng, J.Z.(2012). Investigation on TORCH infections for pregnant women and neonates in Yan an City, China. Zhongguo Xue Xi Chong Bing Fang Zhi Za Zhi., (4):386,392.

پوختە:

گرتەوە ئەمە خوێندنی ڕەنگی هونەری وتاربێژی بۆ بڵاو بوونەوەی تووش بوون T]) [TORCH]وژخۆپلاسما [، R]وبەڵلا [، [CMV]، -HSV]٢ ([لەنێوان ٢٧٦ لە ئافرەتی سکپری ئەوانەی دووچار دەبن لە لەدایك بوون هیتر پێکەوە و سیس بوون لەدایك بوون پێکەوە لە ئەمە خوێندن ئەنجام دا پشکنی سەرجەم حالەت لە تەمەن ئەوەی دەکەوێت لەنێوان]١٨-٤٥ [سااڵی هونەری وتاربێژی لەاڵیەن

تاقی کردنەوە [ELISA]بۆ ئاشکراکردن لە لەشی کرداری دژ یا هاوتا I]گ [Gو I]گ [Mبۆ هۆکار نەخۆشی.

ئەنجام دا دابەش کردنی نەخۆش بۆ کۆمەڵە ، ١٨٤)٦٦] .٧٪ ([لە ئافرەتی ئەوانەی دووچار دەبن لە لەدایك بوون هیتر پێکەوە و ٩٢)٣٣] .٣٪ ([لە ئافرەتی ئەوانەیی لەدایك بوونی پێکەوە پیشان دا ئەنجام لە سەرجەم]١٨٤من [ئافرەتی سکپر ٦٦)٣٥ .]٩٪ ([کانۆی ئیجابی] .گۆندیيI] [گ [Gو ٦)٣] .٣٪ ([کانۆی ئیجابی] .گۆندیيI] [گ .[Mو لەو کاتەی پەیوەندی پێوە بوون بە [CMV]، ١٥٩)٨٦] .٤٪ ([کانۆی ئیجابی بۆ CMV-I]گ[G

و ٢٩)١٥] .٨٪ ([بۆ CMV-I]گ .[Mلەسەر ئاستی دوایین ،١٠٨)٥٨] .٧٪ ([و ٣)١] .٦٪ ([کانۆی ئیجابی بۆ R]وبەڵلا [I]گ [Gو I]گ [Mبە پی ی ڕیز .و بوو ئاست I]گ [Gو I]گ [Mدژ بە HSV]٢ [کانۆی ئیجابی کە ١٤٠)٥٦] .٥٪ ([و ٢٠) ١٠] .٩٪ ([بە پی ی ڕیز پیشان دا ئەنجام لە سەرجەمێك پشکنی ٩٢ لە ئافرەتی سکپر ، ٣٨)٤١] .٣٪ ([کانۆ ئیجابی] .گۆندیيI] [I]گ [Gو حالەت یەك تەنها)١] .١٪ ([بوو]إیجابیة] .[TگۆندیيI] [گ .[Mو بەدیارکەوتن کە ٧٩)٨٥] .٩٪ ([و ٥)٥ .]٤٪[کانۆی ئیجابی دژ بە CMV-I]گ [Gو CMV-I]گ [Mبە پی ی ڕیز .و بوو وەڵام دانەوە بۆ R]وبەڵلاI-گ [٤٣G)٤٦ .]٧٪ ([و %])١ .[١ (١ R]وبەڵلاI-گ [Mلەنێوان کۆمەڵەی بەڵا .لەو کاتەی بوو]الاصابه] [بHVS٢ [، ٤٨)٥٢ .٢ (%بۆ I]گ [Gو ٤)٤]٪ ([بۆ I]گ[M

و بوو تووش بوون [TORCH]سەرەوە گەڵێك لە لای ئافرەت لە کۆمەڵە [BOH]لە ئەو ئافرەتی پێکەوە بۆ لەدایك بوون.

پیشان دا ئەنجام لە سەرجەمێك پشكنی ١٨٤ لە ئافرەتی سكپر لە كۆمەڵە [BOH]،١٠٢)٥٥] .٤٪ ([دووچار دەبن لە لەبار چوون بۆ جار یەك ئەو ٥٠)٢٧] .٢٪ ([لەگەڵ لەبار چوون دوو جار ، ٢٧)١٤] .٧٪ ([لەگەڵ لەبار چوونی سیانی ، ٥)٢] .٧٪ ([لە حالەتی لەبار چوون بۆ چوار جار یان زیاتر .پیشان دا ئەنجام لە سەرجەمی ١٠٢ لە ئافرەتی سكپری ئەوانەی دووچار دەبێت لە لەبار چوون یەك ، ٤٣)٤٢] .٢٪ ([كانۆی ئیجابی] .گوندیيI] [گ [Gو ٢)٤] .٩٪ ([كانۆ ئیجابی] .گوندیيI] [گ .[Mلەو كاتەی پەیوەندی پێوە بوون بۆ تەنیەوە [CMV]لە لەنێوان ئەو كۆمەڵە ، بوو ٨٩)٨٧] .٣٪ ([كانۆی ئیجابی CMV-I]گ [Gو ١٧)١٦] .٧٪ ([كانۆی ئیجابی بۆ CMV-I]گ .[Mو لە لایەنی دیكە ، بوو ٦٣)٦١] .٨٪ ([و ٣)٢] .٩٪] ([لRوبەڵلا-Iگ [Gو R]وبەڵلاIـگ [Mئیجابی بە پی ی ڕیز .بەڵام ئاست I]گ [Gو I]گ] [Mضد-٢HVS [كانۆی ئیجابی لە ٦٣)٦١ .]٨٪ ([و ١٤)١٣] .٧٪ ([بە پی ی ڕیز.

و لەو كاتەی پەیوەندی پێوە بوون بە كۆمەڵەی ئافرەتی ئەوانەی دووچار دەبێت لە لەبار چوون دوو جار)٥٠ (، ئاشكرا كرد ئەنجام كە ١٤)٢٨] .٠٪ ([و ١)٢] .٠٪ ([كانۆی ئیجابی I]گ [Gو I]گ] .[Mگوندییعلی التوالي .[لە لایەنی دیكە ٤٣ %])٨٦ .[٠ (و ١٦ .)٠ (%كانۆی ئیجابی بۆ CMV-I]گ [Gو CMV-I]گ [Mبە پی ی ڕیز .بەربەرەكانی دەكات R]وبەڵلاIـگ [Gلە ٢٩) ٥٨] .٠٪ ([لە حالەتی لەبار چوون دوو جار ، لەو كاتەی حالەت دژ بە I]گـMمن [ڕێك و پێكی خۆی نەبوو بە ئەندام هەر تووش بوون .و لەو كاتەی پەیوەندی پێوە بوون بە ئاست I]گ [Gو I]گ [Mدژ بە -HSV]٢ [، پیشان دا خوێندن كە ٢٩)٥٨] .٠٪ ([و ٣)٦ كانۆی ئیجابی بە پی ی ڕیز.

و بوو ژمارەی حالەت لە لەبار چوونی سیانیی ٢٧ حالەت ، لە ئەمە حالەتی)١١] .١٪ ([كانۆی ئیجابی] .گوندیيI] [گ [Gلەو كاتەی دەر دەكەوێت هەر حالەت دژ بە

] .گوندیيI] [گ .[Mو بوو ڕێژەی ٣)٤] .٢٪ ([و ٢٢)٣٠ .٦] .٥٪ ([كانۆی ئیجابی]للمضادCMV-Iگ [Gو -CMV] Iگ [Mبە پی ی ڕیز .بەربەرەكانی دەكات وەڵام دانەوە بۆ R]وبەڵلا [،]I٢] [-HSVگ [Gو -HSV]I٢] [گ [Mلە ١٢)١٦ .]٧٪ ([، و ١٠)١٣] .٩٪ ([و ٠)٠] .٠٪ ([، ٣)٤] .٢٪ ([بە پی ی ڕیز.

و بوو ژمارەی حالەتی لەبار چوون بۆ چوار جار یان زیاتر)٥ (حالەت ، لە ئەمە حالەتی ١)٢٠] .٠٪ ([، ٠)٠] .٠٪ ([، ٥)]١٠٠٪ ([، ١)٢٠] .٠٪ ([كانۆی ئیجابی بۆ] .گوندیيI] [گGوI] [گ] .[Mگوندییو [CMV] [بە پی ی ڕیز .لەسەر ئاستی دوایین ، ٤])٨٠٪ ([، ٢])٤٠٪ ([كانۆی ئیجابی بۆ R]وبەڵلاIـگ [Gو -HSV]I٢گGعلي [بەدوای یەكدا ، لەو كاتەی نەبوو هەیە هەر تووش بوو دژ بە I]گ [Mلە هەمان هۆكار نەخۆشی .كە ١٣٤)٧٢] .٨٪ ([لە ئافرەتی سكپر لە كۆمەڵە [BOH]، ١٤)٧] .٦٪ ([بوو لایانی لەدایك بوونی شێواو پاك داوێن ، ١٣)٧] .١٪ ([دواكەوتن گەشە كردن لەناو ڕەحم ، ١٠)٥] .٤٪ ([لە لەدایك بوونی زوو و ١٣)٧ لەدایك بوونی مردوو ئەو.

هەروەها دۆزییەوە كە ژمارەی حالەت بوو نزم)٢ /١٨٤ (١) .١٪ [بۆ چینی تەمەنم لە]٣٩ [-٤٥ ساڵ لەو كاتەی كە زۆربەی حالەت)١٠٥ /١٨٤ (٥٧] .١٪ [لەنێوان ٢٥ ٣١ ساڵ. و لەڕاستیدا دۆزییەوە كە وەڵام دانەوە]لIگ [Gدژ بە] .گوندیي١٩) [٤١ .]٣٪ ([و ٤٢)٩١ .٣] (%ل [CMVو ٣٠)٦٥ .٢ (%بۆ -HSV]٢ [كانۆ زیاتر باو لە چینی تەمەنم ١٨ ٢٤ ساڵ

تەنها لە R]وبەڵلا [وەڵام دانەوە بوو بەرز لە سەرجەم تەمەن .هەروەك دۆزییەوە هەروەها كە]الاستجابةCMV-Iگ [Gبوو بەرز ٢٨)٩٠] .٣٪[

لە چینی تەمەنم لە]٣٢-٣٨ [ساڵ]تلیها [٨٧)٨٢] .٩٪ ([لە چینی تەمەنم لە]٢٥-٣١ [ساڵ .دەربارەی I]گ] .[Mگوندیي [، [CMV]، و R]وبەڵلا] [وHSV٢ [بەرز لە چینی تەمەنم]١٨-٢٤ [ساڵ لەلای بەراورد لەگەڵ كۆمەڵە دیكە و بووە ٥)١٠] .٩٪ ([٩ ،)١٩] .٦٪ ([، ١)٢] .٢٪ ([و ٧)١٥] .٢٪ ([بە پی ی ڕیز.

و بەدیاركەوتن لە ئەنجامی ئیجابی بۆ تووش بوون [TORCH]لەنێوان كۆمەڵەی ئافرەت ([BOH])لەو كاتەی پەیوەندی پێوە بوون بە ماوەی سكپری ، لە سەرجەم حالەت بوو ڕێژەی تووش بوونی بەرز)٨٤ /١٨٤ (٤٥] .٧٪ [لە ماوەی مانگی سێ یەكەم لە سكپریی بەراورد لەگەڵ قۆناغی دیكە .لەسەر ئاستی دوایین ، بەربەرەكانی دەكات نزمترین تێكڕای تووش بوون)٢٣ /١٨٤ (١٢] .٥٪ [لە قۆناغی سێ مانگ دوایین لە سكپری .بوو ئاست I]گ] .[Mگوندیي [، [CMV]، R]وبەڵلا [و HSV]٢ [بەم شێوەی ٢١] .٤٪ [، ٤] .٨٪ [و ٢ .٤ و ١٤ .٣ بە پی ی ڕیز.

الخلاصة

تضمنت هذه الدراسة مسحة مصلية لانتشار إصابات TORCH (*Toxoplasma,Rubella*,CMV,HSV-2) بين 276 من النساء الحوامل الذين يعانون من ولادات غير سوية وذوي الولادات السوية في هذه الدراسة تم فحص جميع الحالات من الاعمار التي تتراوح بين 45-18سنة مصليا بواسطة اختبار ELISAللكشف عن الأجسام المضادة IgGو IgMالمسببات الأمراض.

تم تقسيم المرضى إلى مجموعتين، 184(66.7٪ (من النساء الذين يعانون من ولادات غير سوية و92(33.3٪ (من النساء اللواتي ولاداتهم سوية .

اظهرت النتائج من مجموع 184من النساء الحوامل ان 66(35.9٪ (كانوا إيجابيا *T.gondii* IgGو 6(3.3٪ (كانوا إيجابيا . *T.gondii* IgMوفيما يتعلق ب *CMV*، 159(86.4٪ (كانوا إيجابيا ل *CMV*-IgGو 29(15.8٪ (ل .*CMV*-IgMعلى صعيد آخر، 108(58.7٪ (و 3(1.6٪ (كانوا إيجابيا ل *Rubella* IgGو IgMعلى التوالي .و كانت مستويات IgGو IgMضد *HSV2* كانوا إيجابيا حيث 140(56.5٪ (و 20(10.9٪ (على التوالي.

اظهرت النتائج من مجموع فحص 92من النساء الحوامل ، 38(41.3٪ (كانوا إيجابيا *T.gondii* IgGوحالة واحدة فقط1(1.1٪ (كانت إيجابية .*T.gondii* IgMوتبين أن 79(85.9٪ (و 5(5.4٪ (كانوا إيجابيا ضد *CMV*-IgGو *CMV*-IgMعلى التوالي . وكانت الاستجابة ل 43(46.7 *Rubella*-IgG٪ (و *Rubella*-IgM 1(1.1%)بين المجموعة العادية .فيما كانت الاصابه ب*HVS2* ، (% 52.2)48الى IgGو 4(4.3٪ (الى IgM

وكانت اصابات TORCHأعلى بكثير لدى النساء من مجموعة BOHمن تلك النساء السويات للولادات.

اظهرت النتائج من مجموع فحص 184من النساء الحوامل من مجموعة BOH، 102(55.4٪ (يعانون من الإجهاض لمرة واحده 50(27.2٪ (مع الإجهاض مرتين، 27(14.7٪ (مع الإجهاض الثلاثي، 5(2.7٪ (من حالات الإجهاض لأربعة مرات او أكثر.

اظهرت النتائج من مجموع 102من النساء الحوامل اللواتي يعانين من الإجهاض واحدة، 43(42.2٪ (كانوا إيجابيا ا *T.gondii* IgGو 2(4.9٪ (كانوا إيجابيا .*T.gondii* IgMفيما يتعلق لعدوى *CMV* من بين تلك المجموعة، كان 89(87.3٪ (كانوا إيجابيا *CMV*-IgGو 17(16.7٪ (كانوا إيجابيا ل .*CMV*-IgMومن ناحية أخرى، كانت 63(61.8٪ (و 3(2.9٪ (ل *Rubella*-IgGو *Rubella*-IgMايجابية على التوالي .اما مستويات IgGو IgMضد *HVS-2*كانوا إيجابيا في 63(61.8٪ (و 14(13.7٪ (على التوالي.

و فيما يتعلق بمجموعة النساء اللواتي يعانين من الإجهاض مرتين (50)، كشفت النتائج أن 14(28.0٪ (و 1(2.0٪ (كانوا إيجابيا IgGو *T.gondii* IgMعلى التوالي .من ناحية أخرى (86.0%)43و (8.0%)16كانوا إيجابيا ل *CMV*-IgGو *CMV*-IgMعلى التوالي .سجلت *Rubella*-IgGفي 29(58.0٪ (من الحالات الإجهاض مرتين ,في حين حالات ضد IgMمن الممرض نفسه لم تسجل اي اصابة .و فيما يتعلق بمستويات IgGو IgMضد *HSV-2*، اظهرت الدراسة أن 29(58.0٪ (و 3(6.0٪ (كانوا إيجابيا على التوالي.

وكان عدد الحالات من الإجهاض الثلاثي 27حالة، من هذه الحالات 8(11.1٪ (كانوا إيجابيا *T.gondii* IgGبينما لم تظهر أي حالة ضد .*T.gondii* IgMوكانت نسبة 3(4.2٪ (و 22(30.6.5٪ (كانوا إيجابيا للمضاد *CMV*-IgGو *CMV*-IgMعلى التوالي .سجلت الاستجابة ل *Rubella, 2HSV*- IgGو *HSV-2* IgM في 12(16.7٪(، و 10(13.9٪ (و 0(0.0٪(، 3(4.2٪ (على التوالي.

وكان عدد الحالات الإجهاض لأربعة مرات او اكثر (5)حالات، من هذه الحالات 1(20.0٪ (، 0(0.0٪(، 5(100٪(، 1(20.0٪ (كانوا إيجابيا لـ *T.gondii* IgGو *T.gondii* IgMو *CMV* على التوالي .على صعيد آخر، 4(80٪ (، 2(40٪ (كانوا إيجابيا ل *Rubella*-IgG و *HSV*-2IgGعلى التوالي، في حين لم تكن هناك أي اصابه ضد IgMمن نفس مسببات الأمراض.

أن 134(72.8٪ (من النساء الحوامل من مجموعة BOH، 14(7.6٪ (كانت لديهم ولادات مشوهين خلقيا، 13(7.1٪ (تأخر النمو داخل الرحم، 10(5.4٪ (من الولادة المبكرة و13(7.1٪ (ولادات ميته.

وقد وجد أن عدد الحالات كانت منخفضة 1.1 (2/184)٪ ينتمون إلى الفئة العمرية من 45 -39سنة في حين أن معظم الحالات 57.1 (105/184)٪ بين 31- 25سنة .و قد وجد أن الاستجابة ل IgGضد 19(41.3) *T.gondii*٪ (و 42(91.3%) ل*CMV* و 30(65.2%)ل *HSV-2* كانوا أكثر شيوعا في الفئة العمرية 24- 18سنة إلا في Rubellaالاستجابة كانت عالية في جميع الأعمار .كما وجدت أيضا أن الاستجابة *CMV*-IgGكانت عالية 28(90.3٪ (في الفئة العمرية من 38-32سنة تليها 87(82.9٪ (في الفئة العمرية من 31-25سنة .فيما يتعلق ب*T.gondii* IgM ، *CMV*، و *Rubella*و*HSV2* عالية في الفئة العمرية 24-18سنة عند المقارنة مع المجموعات الأخرى وكانت 5(10.9٪ (، 9(19.6٪ (، 1(2.2٪ (و 7(15.2٪ على التوالي.