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SEROPREVALENCE OF ANTI-TOXPLASMA GONDII, ANTI-RUBELLA, ANTI-CYTOMEGALOVIRUS AND ANTI-HERPES SIMPLEX IGM ANTIBODIES IN PREGNANT WOMEN IN BAGHDAD

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ABSTRACT

Congenital anomalies can be caused by perinatal infections, for this reason early recognition of maternal infections are important for all clinicians. TORCH test (Anti-IgM for Toxoplasma gondii, Rubella, Cytomegalovirus and Herpes simplex) was done to 161 pregnant women in Baghdad to establish basic knowledge for future pregnancy care. Blood samples of pregnant women were subjected to TORCH Test. This study showed that the seropositive of pregnant women for anti-Toxo IgM is 30 (18.63%), the seropositive for anti-rubella is 11 (6.83%), for the anti-CMV is 21 (13.04%) and for anti-herpes is 15 (9.31%). A total number of Threat Abortion with infection is 93 (57.7%), Total number of Threat Abortion with infection is 23 (14.28%). This study revealed that TORCH infections may cause spontaneous abortion and T. gondii and CMV infection has greater rate in comparison to Herpes and Rubella virus.

Key words: Toxoplasma; Rubella; Cytomegalovirus; HSV; IgM

INTRODUCTION

Many infectious agents like cytomegalovirus (CMV), rubella virus and Toxoplasma gondii and Herpes simplex virus may lead to maternal disease that can transmit to the utero at some stages during the pregnancy (Li et al., 2009). These infections may cause repeated abortions, intrauterine deaths and other reproductive failures, especially when the infection occurred during pregnancy in first trimester (Sen et al., 2012). During pregnancy a temporary immune inhibition occur (Mellor and Munn, 2001) which can lead to increase the probability of pregnant women to various infections.

CMV is one of the most clinically important viral infections of the fetus (Scott et al., 1997). This virus is a common herpesvirus that causes a mild disease. In developing countries more than 90% of babies may be infected by the virus in childhood while the ratio in developed countries is 60%, It is the most congenital viral infection in the United States of America; nearly 40,000 infants are born with CMV infection a year, so this virus is widespread and can cause birth defects like Down syndrome, fetal alcohol syndrome (Alford et al., 1990), hearing loss in children (Fowler and Boppana, 2006). In the U.S.A the women may get the infection from their infected partners. In relative immune-compromised status during pregnancy the virus reactivation may occur. The severity of fetal infection depends on viral load in amniotic fluid of the child or in the plasma of the newborn. Maternal immunity can reduce viral transmission to fetus (Ammer, 2016).

Toxoplasma gondiiis is an obligate intracellular parasite that causes infection to human and many mammals (Kijlstra and Jongert, 2008). Many cases of Toxoplasma infections were occurred in pregnant women in Europe, Latin America, Africa, Middle East and south-east Asia (Al-Tantawi, 2014). In most cases toxoplasmosis may be asymptomatic while in immune-compromised individuals may cause lead to pneumonia and encephalitis (Weiss and Dubey, 2009). Infection during pregnancy can result in spontaneous abortion (Montoya and Liesenfe, 2004). Rubella infection caused by RNA virus from paramyxovirus. It spreads within the family. The fetuses of infected women during the first three months of pregnancy can be affected by the virus in a ratio of 30 % to 50%. During gestation of infected woman, the virus may transmit to the baby via placenta (Coulter et al., 1999). Infection in the first three months of pregnancy can cause congenital defects like, deafness and or blindness (Deorari et al., 2000).

Herpes simplex virus is a DNA virus, one of herpesvirus group. The infection is mainly acquired by contact with mother's infected birth canal. The infection with the virus is an important cause of death. (Barah, 2012).

MATERIALS AND METHODS

Blood samples were taken from pregnant women in 2016 and 2017. The serum was separated from blood. The samples were subjected to TORCH test for detection anti-IgM of Toxoplasma, Rubella, CMV, Herpes virus. The kit used in this study was One Step Rapid Test (HEALGEN, USA) according to the manufacturer's instructions.

RESULTS AND DISCUSSION

Blood samples of 161 pregnant women were collected during four months in Baghdad in order to be tested for Toxoplasma gondii, Rubella, CMV, Herpes simplex infections. The seropositive of pregnant women for anti-Toxo IgM is 30 (18.63%), the seropositive for anti-rubella is 11 (6.83%), for the anti-CMV is 21 (13.04%) and for anti-herpes is 15 (9.31%). Total number of complete Abortion with infection is 93 (57.7%), Total number of complete Abortion without infection is 23 (14.28%).

The infectious agents Toxoplasma gondii, Rubella virus, Cytomegallovirus, Herpes virus are known as the major causes of congenital malformation. The first three months of pregnancy may be fraught with many complications, such as bleeding or pain (Florence *et al.*, 1999). Several factors may lead to Pregnancy loss, could be genetic or uterine abnormalities. Also, hormonal and immunological dysfunctions, bacte-

ria and viruses, air or water pollutants. All these factors may result in spontaneous abortion (Dicker *et al*., 1992). TORCH infections in pregnancy are major causes of maternal and fetal morbidity and mortality.

Table 1: Seropositive of anti-toxoplasma, anti-rubella, anti-CMV, anti-Herpes simplex in pregnant Women

	No. of seropositive	**Percentage %**	**No.of seronegative**	**Percentage %**
anti-toxoplasma	*31*	*18.63*	*131*	***81.37***
anti-rubella	*11*	*6.83*	*150*	***93.17***
anti-CMV	*21*	*13.04*	*140*	***86.95***
anti-Herpes simplex	*15*	*9.31*	*156*	***90.69***
Total number of Threat Abortion with infection	*93*	*57.76*	*68*	***42.24***
Total number of Threat Abortion without infection	*23*	*14.28*	*138*	***85.72***

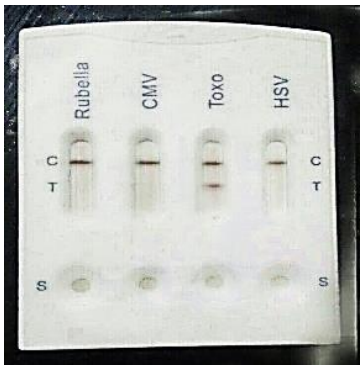

Image 1: Toxo Positive.

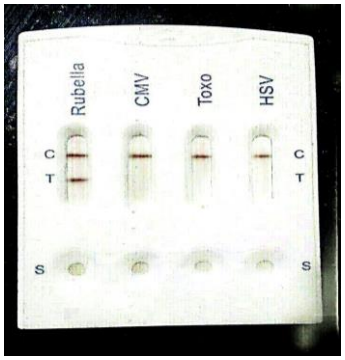

Image 2: Rubella Positive.

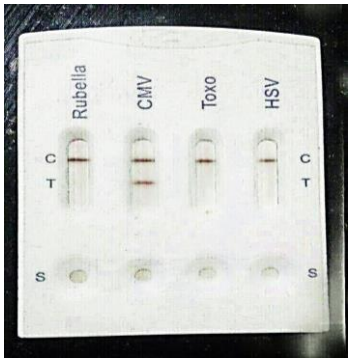

Image 3: CMV Positive

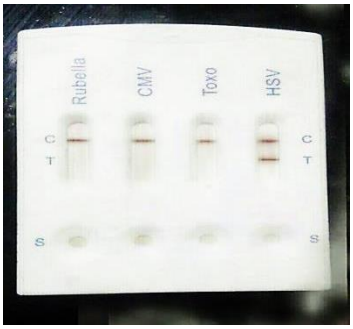

Image 4: HSV Positive

Image 5: Negative

This study revealed that the seroprevalence of T. gondii is 31(18.63%). The parasite may transmit vertically to the foetus through placenta, or horizontally which could be involved three life cycle stages, Ingesting sporulated oocysts from cats or tissue cysts in unwell cooked meat or tachyzoites in blood or primary offal (viscera) of many animals and unpasteurized milk. The examined women could be infected with the disease before marriage and the infection might be chronic. In a study of Al-Hawija showed that it is more contaminated by the T. gondii compared to Al-Baiji city and this could be because that Al-Hawija is an agricultural area, therefore there are many animal keepers and there is possible transmission of the parasite.

Also, high prevalence of toxoplasmosis may be due to several risk factors like age, the number of deliveries, contact with animals, drink of raw milk and bad health education, poor medication (Ghoneim, *et al*., 2009).

The present study shows a relatively high seroprevalence of CMV IgM 21 (13.04%). The incidence of congenital CMV infection increases as maternal CMV seroprevalence increases (Bakıcı *et al.,* 2002). High rate of CMV woman infections occur in pregnancy period (Kenneson, 2007). Seroprevalence survey has to be done periodically in order to decrease maternally mortality and morbi-dity caused by CMV infection. Two types of vacc-ine are needed in phase II of production. One of them is a recombinant vaccine which contain the envelope glycoprotein B of CMV with the adjuvant MF59 to induces high titer of neutralizing antibodies (Pass, 2009). The other one is live attenuated CMV Towne strain (Griffiths, 2009). In previous study in Iraq, The CMV IgM seroprevalence in women was 6.3% and varied, but now it was significantly in pregnant women (9.6%) and non-pregnant (3.2%). CMV seropositivity is 0% in Turkey (Ozdemir *et al*., 2012) , 13% for Poland (Gaj *et al*., 2012) , 8.42% for India (Nahum *et al*., 2012). While in Arab countries, the CMV IgM seropositivity is 2.3% for Jordan (Daboubi and Al-Zaben, 2000), 57.2% in Babylon-Iraq (Al-Marzoqi *et al*., 2012).
The current study revealed that the CMV infection rate in Baghdad was lower than reported for Waset, Babylon (Jasim and Majeed *et al*., 2011)., Diwaniya (Al-Shimmery *et al*., 2011), and Al-Hila (Alsaeed et al., 2008). In conclusion, maternal CMV infection in Iraqi population represents a health problem which must be cared by local healthcare employers.

The seroprevalence of rubella is varied according to health district, urban or rural residence. In a study of rubella antibody seroprevalence in Namibia in 2010, among pregnant women sera collected by the National HIV Sentinel in Namibia, rubella seroprevalence was 85%. In urban the ratio of rubella seroprevalence was higher than those in rural resident. Variation also observed in rubella seroprevalence due to health district. In previous studies in the Africa, rubella seropositive was estimated of 72–99% in women at age of reproduction (CDC, 2013). The risk of rubella infection can transmit to the fetus and may cause Congenital Rubella Syndrome (CRS) (Ganima and Layla, 2012) Vaccination may decrease the circulation of rubella virus sufficiently, but cannot eliminate due to it, the exposure of children and older age groups. In a study in Kirkuk province in Iraq, the prevalence of anti-rubella IgG antibodies in 64 pregnant women with abortion rate was 37(57.8%) (Lezan, 2015). One study showed that the seropositivity of IgG decreased with the increase of age (Gupta *et al*., 2006). The seroprevalence of rubella IgM antibodies was higher in women at ages of 25-34 years [Eleazu et al., 2012). In Diyala, Iraq the IgM-seropositivity in pregnant was 8 (26.7%) and 3(5%) (Hasan *et al*., 2010). A previous study in Baghdad, the seroprevalence of IgM in women with abortion 34.2% (Abdul-Karim *et al*., 2009). The Strategic Plan of global rubella for 2012–2020 revealed the need to maintain high levels of individual's immunity by vaccination with two doses of rubella vaccines (WHO, 2016). Serological survey should be estimated to identify susceptible age groups or regions that have to be covered by vaccination (Ganima and Layla, 2012). In a study, 152 healthy Indian pregnant women at gestational age, their mean age was 26 years, the positive for anti-rubella virus IgG antibodies was 134 (88.2%) and the negative was18 (11.8%). In a study of Ananya the seropositive of rubella antibody in age of 20 to 25 is greater than other age groups (Ananya, 2015). Some previous sero-epidemiological studies in India surveys have shown 10- 28% pregnant women have no immunity rubella virus. These women are at risk of infection during pregnancy (Raveendran *et al*., 2012). The infection with herpes simplex virus is the most important sexually transmitted infection in women at the reproductive age, as it may be transmitted to the baby in pregnancy and after birth. The virus can cause death or severe disabilities (Straface *et al*., 2012). The prevalence of herpes virus is variable with various factors may associated with the country and the region of residence, sex, sexual behavior and age. The infection is higher in women compared to men. It is highest in many areas of Africa and some parts of the Americas. In northern Europe is higher than western and southern. In Asia, it is lower than any other geographic regions. Comparisons in prevalence from independent studies reported adequate differences in the populations surveyed and age distributions (Smith, 2002). This study shows HSV seroprevalence 15 (9.3 %). Our finding revealed lower incidence than that reported in Turkey (63.1%) (Duran *et al*., 2003), USA (22%) (Xu *et al*., 2007), Iran (43.75%) (Shahraki *et al.*, 2010), in

Germany (82%) (Sauerbrei *et al*., 2006) and Australia (30%) (Haddow *et al*., 2007). While the prevalence is nearly the same as in China (10.8%) (Chen *et al*., 2007), in Indonesia (9.9%) (Joesoef et al., 1996) and UK (10.4%) (Ades *et al*., 1989). In Zimbabwe it is (51.1%) (Kurewa *et al*., 2010), but the present study seroprevalence was greater than reported for Kashmir (7.5%) (Rathore *et al*., 2010) and Italy (7.6-8.4%) (Straface *et al*., 2012). Furthermore, the seroprevalence in our study was much lower than the seroprevalence in Waset (60. 6%), Iraq (Jasim *et al*., 2011), in Babylon, Iraq (22. %) (Al Marzoqi *et al*., 2012), in Saudi Arabia (27%) (Ghazi *et al*., 2012), in Qatar (26. %) and Syria (52%) (Abu Madi *et al*., 2010). The seroepidemiology of HSV variation in different countries is depending on the demographic, education, socioeconomic status, sexual behavior, region residence and clinical characteristics of the population.

Conclusion

TORCH infections are important risk factors responsible for abnormal pregnant outcomes. Therefore, screening of TORCH has to be done during pregnancy.

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