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Sero epidemiological study of TORCH infection in women of Childbearing age in West of Iran.

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ABSTRACT

Torch infections (TORCH) are including toxoplasmosis, rubella virus, cytomegalovirus and herpes simplex virus. The aim of this study was to evaluate the immunity of Kurdish women at childbearing age against TORCH infections. This cross-sectional study was conducted on 165 married women of childbearing age. Then the specific serology titer of IgG and IgM against TORCH were evaluated using ELIZA method and the results were analyzed by SPSS Ver.20 software. The overall prevalence of TORCH infection was 7.8%. The frequency distribution of TORCH infection showed that the highest frequency of positive IgGwas for rubella and cytomegalovirus as 93.3% and 92.7% respectively and the least of positive IgG was for Toxoplasma by 68.5. Among the IgM-positive cases the highest frequency percentage was belong to herpes simplex with ten positive cases (6%) and the majority of the positive cases were observed in the age group above 25 years. Chi square test showed that there was no statistically significant correlation between the age groups and the positive and negative cases of IgG and IgM (P>0.05). In order to reduce maternal and fetal complicationsof TORCH infection screening programs are necessary and recommended.

Keywords: Child bearing age, infection, TORCH

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INTRODUCTION

TORCH infection includes toxoplasmosis, Rubella virus, cytomegalovirus and herpes simplex which can jointly lead to complications, morbidity, and significant mortality in women of childbearing age particularly in developing countries [1].

Toxoplasmosis is caused by Toxoplasma gondii, and is found in human worldwide, a parasite that the mother can acquire from handling infected cats, drinking unpasteurized milk, or eating contaminated meat [2]. Studies on its antibody indicated that about 20-70% of different countries populations are infected chronically without exhibiting any clinical signs and symptoms [3]. The prevalence of congenital Toxoplasmosis is 1-5 in 1000 pregnancies. Based on the age of the fetus at the time of mother`s infection and the presence or absence of anti-Toxoplasma antibodies in the mother's body it can cause a variety of symptoms [4, 5]. Previous studies showed that about 75% of women worldwide are seronegative and susceptible to disease during pregnancy; and can transmit infections congenitally [6-8].

Rubella or German measles is a member of Togaviridae family. They are present with envelope and Icosahedral capsid, and have RNA as genetic material [9]. In case of fetus contamination, especially in the first trimester it causes congenital anomalies and congenital rubella syndrome. Maternal infection during the first trimester of pregnancy causes fetal infection in 50% of cases, but In case of the mother infection in the second trimester fetal infection is observed in one third of cases. Infectious complications in the first trimester not only are serious but also more willing to engage more organs [10, 11].

Cytomegalovirus is spread worldwide; about 40-50 percent of adults have Cytomegalovirus antibodies. It is one of the most common causes of intrauterine infections [12]. About 90% of primary infections are asymptomatic in mother. The complications are including fever, fatigue, myalgia, hepatitis, lymphadenopathy [13] Infants showed various complications such as optic atropy, microcephaly, hypotonia, intracranial calcifications, and decrease hearing, pneumopathy, thrombocytopenic purpura[14]. If the mother has a primary infection during pregnancy, fetal morbidity rate is high [13]. Severe cases of CMV infection are the leading cause of spontaneous abortion, stillbirth, preterm delivery and congenital anomalies [15]. If pregnant women infected risk of fetal infection is 30-40 percent and also chance of fetal death and stillbirth is about 9% [16].

Herpes simplex virus is member of herpesviridae family. There are two forms of Herpes simplex virus namely; HSVI and HSVII. HSVI causes gingivostomatitis, pharyngitis, and not very often in genital infection but HSV2 mainly involve in the genital herpes. Infection occurs firstly via direct contact with infected lesions [3]. Newborns acquire infection through an infected vaginal. Congenital infection with the virus during the first trimester may disrupt organ formation and born on infants with microcephaly, microphthalmia, intracranial calcification, chorioretinitis, cataracts and heart defects [17].

In childbearing age these infections are as latent infection without symptoms, therefore their clinical diagnosis is difficult. It is difficult to distinguish between primary infection and recent chronic infection with conventional methods. ELIZA is gold standard for the diagnosis of Toxoplasma gondii [18]. ELISA methods are commonly performed in many countries to detect anti-toxoplasma antibodies [19]. ELISA results are generally well accepted by clinicians because of their excellent sensitivities and specificities, the rapid availability of results, and the relatively low costs of the tests [20].

The High prevalence of the TORCH infection have been reported among pregnant women and women of childbearing age from different foci in Latin America, parts of Eastern / Central Europe, the Middle East, parts of south-east Asia and Africa[21]. Toxoplasma IgG high rate has been reported for Nepal (55.2%), while high (42.5%) and lowest (6.97%) active toxoplasma infections has been reported for India. In Arab countries, IgG and IgM higher and lowest seroprevalence rates were for Iraq. The higher susceptibility rates for Rubella in Arab countries excluding Iraq were reported in Morocco (83.4%), Sudan (34.7%), Qatar (25.1%), and Tunisia (20.3%). The lowest susceptibility was reported for Saudi Arabia (6.7%) [22].A study showed a high prevalence of infections caused by TORCH agents among Iranian pregnant women that 63.8% of the pregnant women were at the risk of at least one of the TORCH agents [23].

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The aim of this study was to evaluate the immunity of Kurdish women at childbearing age against TORCH infections that referred to Sanandaj Welfare Medical Centers from 2013 to 2014.

Experimental Section

This cross-sectional study was conducted on 165 married women of childbearing agewho attended to Sanandaj Welfare Medical Centers from 2013 to 2014. After being sure of not being pregnant the blood samples were collected based on LMP. Then the specific serology titer of IgG and IgM against TORCH agents was evaluated using ELIZA method. Data; including demographic information andLab test results were recorded in a questionnaire. Data were analyzed using SPSS Ver.20.Mean age, frequency and percentage of subjects was calculated for each TORCH agent. To evaluate the relationship between qualitative variables Chi-square test (X^2) was used.

RESULTS

The mean age and standard deviation of the women in the study was 25.2 ±5.07 years. Total of 53.4% of them were over 25 years of age. Based on level of education the highest frequency of TORCH infection (44.7%) was related to subjects with high school diploma and Associate Degree and lowest (4.2%) was related to illiterate subjects. (Table 1). The results of this study showed that base on IgM positive, the overall prevalence of TORCH infection was 7.8%. The frequency distribution of TORCH infection showed that the highest frequency of positive IgG was for rubella and cytomegalovirus as 93.3% and 92.7% respectively and the least of positive IgG was for Toxoplasma by 68.5%. In terms of age most cases were in the age group under 25 years. Among the IgM-positive cases the highest frequency percentage was belong to herpes simplex with ten positive cases (6%) and the majority of the positive cases were observed in the age group above 25 years. Chi square test showed that there was no statistically significant correlation between the age groups and the positive and negative cases of IgG and IgM (P>0.05). (Table 2). Based on place of living almost85 percent of IgG positive were living in city and 15% were living in village. Regarding IgM positive no cases of toxoplasmosis, rubella and cytomegalovirus was observed in those who living in village (Figures 1and 2).

Table 1: The frequency of TORCH infection cases in terms of level of education and place of living

Variables		Number	Percent
Education Level	Illiterate	7	4.2
	Below High School Diploma	57	34.6
	High School Diploma and Associate Degree	74	44.7
	Bachelor and higher	27	16.5
Place of Living	City	141	85.4
	Village	24	14.6

Table 2: The frequency of toxoplasmosis, cytomegalovirus, rubella and herpes simplex in terms of age

		IgG		IgM	
		Positive No. (%)	**Negative No. (%)**	**Positive No. (%)**	**Negative No. (%)**
Toxoplasmosis	Under 25 years	64 (55.6)	29 (55.8)	1 (100)	92 (56)
	Above 25 Years	49 (43.4)	23 (44.2)	0 (0)	72 (44)
	Total	**113 (68.5)**	**52 (31.5)**	**1 (0.6)**	**164 (99.4)**
Rubella	Under 25 years	85 (55.1)	8 (72.7)	1 (50)	92 (56.4)
	Above 25 Years	69 (44.9)	3 (18.3)	1 (50)	71 (43.6)
	Total	**154 (93.3)**	**11 (6.7)**	**2 (1.2)**	**163 (98.8)**
Cytomegalovirus	Under 25 years	85 (55.5)	8 (66.6)	0 (0)	93 (56.3)
	Above 25 Years	68 (44.5)	4 (33.4)	0 (0)	72 (43.7)
	Total	**153 (92.7)**	**12 (7.3)**	**0 (0)**	**165 (100)**
Herpes Simplex	Under 25 years	79 (54.1)	14 (73.6)	4 (40)	89 (57.4)
	Above 25 Years	67 (45.9)	5 (26.4)	6 (60)	66 (42.6)
	Total	**146 (88.5)**	**19 (11.5)**	**10 (6)**	**155 (94)**

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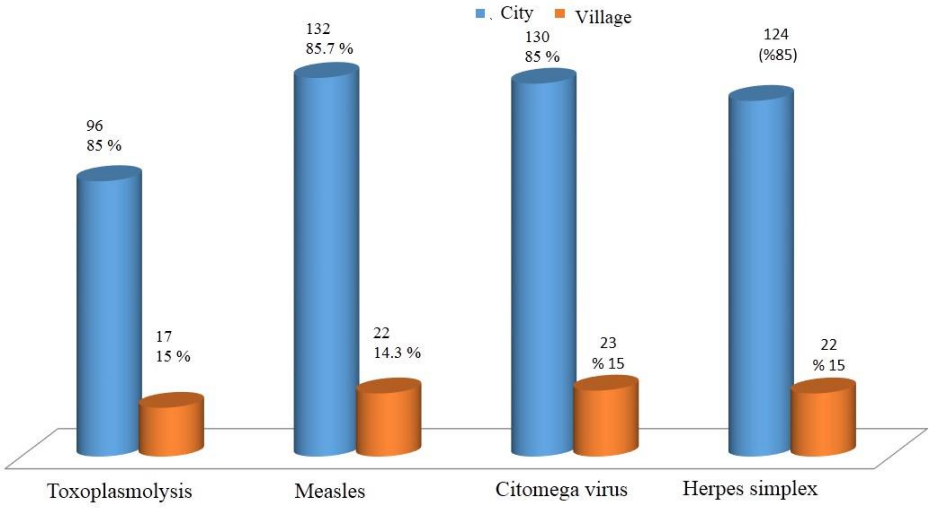

Diagram 1: The distribution frequency of IgG positive cases based on the place of living

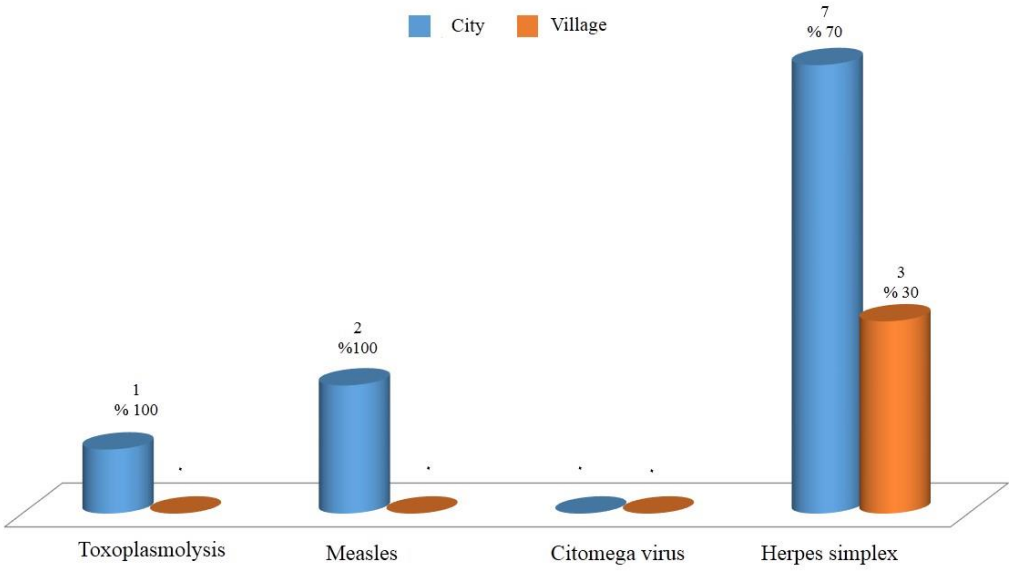

Diagram 2: The distribution frequency of IgM positive cases based on the place of living

DISCUSSION

The results of present study showed thatbased on the place of living almost85 percent of IgG positive cases were living in city and 15% were living in village. Regarding IgM positive no cases of toxoplasmosis, rubella and cytomegalovirus was observed in those who live in village. In a study by Chopra et al.65% of positive cases were living in city [24].While Vilibic-Cavlek et al showed that women residing in rural regions had a significantly higher sero prevalence rate for T. gondii, CMV, and HSV-1 than urban women [25].

The prevalence of TORCH infection in Chinese women before pregnancy was 17.2% [26] while the results of present study showed that in terms of IgM positive the prevalence of TORCH infection was 7.8%. The

Highest frequency of infections in IgG positive was related to cytomegalovirus and rubella and in IgM positive was related to herpes simplex.

In our study the majority of the positive cases were observed in the age group above 25 years. Poorman et al also reported that with increasing age more cases of herpes simplex were observed [27],while in a study by Sen the seropositivities for each component of the TORCH infections were seen in a majority of the cases which were in the 19-25 years age group [28].

In the present study the most cases with 80% of IgG positive were related to herpes simplex virus while in Chopra et al.study this amount was 24% [24]. Janan et al in their study showed that the seroprevalence of IgG positive for cytomegalovirus was 77.3% and for IgM positive was 50.4% while in our study it was 92.7% and 0% respectively.

In a study by Padmararhy which was conducted in India the IgM/IgGsero positivity to T. gondii, Rubella, CMV and HSV-2 was 5.8/8.0%, 4.6/90.8%, 9.2/95.4%, and 2.3/5.8% respectively [29] compare to our study the prevalence of IgG positive for toxo plasma and rubella was lower. In our study the prevalence of IgG positive for cytomegalovirus was zero that was not in consistent with Padmararhy`s study. Neirukh showed that HCMV IgG and IgM were positive in 96.6% and 11.5 of pregnant women in Palestine [30] which were not in consistent with our study. The difference may be due to population because our subjects were non pregnant women while in Neirukh`s study they were pregnant.

In a study by Acharya in Nepal an infection susceptibility rate of 77.9% to Toxo plasma gondii, 11.7% to Rubella, 51.9% to CMV, and 84.4% to herpes simplex was reported. No significant difference in relation to age was found in seropositivity between the study and the control groups[31]. Compare to our findings infection susceptibility rate of 84.4% to herpes simplex is almost near to ours (88.5%), but IgG positive for Toxoplasmosis and cytomegalovirus in our study are higher than Acharya`s findings.

In a study by Ghazi which was conducted in Saudi Arabia Toxoplasma IgG antibodies were detected in 35.6%, CMV total IgG antibodies were found in 92.1%, rubella IgG antibodies in 93.3%, HSV-1 IgG antibodies in 90.9% [32].Levels of antibodies for herpes simplex and cytomegalovirus were consistent with our study.

CONCLUSION

With regard to this fact that TORCH infection islatent and presence of infection had no obvious clinical symptoms in women in childbearing age and also pregnant women, screening programs for accurate diagnosis of Torch infection using specialized tests in order to reduce maternal and fetal complications arenecessary and recommended.

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Author Contributions

Asadollah Fatollahpour, Aida Fatollahpour, puria ramezany, and Robabeh Mohammadbeigi conceived and designed the experiments; Aida Fatollahpour, puria ramezany performed the experiments; Daem Roshani analyzed the data; Aida Fatollahpour, puria ramezany contributed reagents/materials/analysis tools; Asadollah Fatollahpour, Aida Fatollahpour, Golaleh Karbassi, Daem Roshani, puria ramezany, Robabeh Mohammadbeigi wrote the paper.

Conflicts of Interest: The authors declare no conflict of interest.

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