ORIGINAL ARTICLE

Seroprevalence of Toxoplasma Gondii among pregnant women visiting antenatal Clinic at the Mosul City, Iraq.

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ABSTRACT

Aim: To determine (T gondii) seroprevalence in among women attending PHCs-(ANC), as well as to identify the infection risk factors

Methods: A cross-sectional study in Mosul-Iraq City has been carried out. For the period from November 2019 to January 2020, five ml of blood samples were collected from 150 women suspected of PHC toxoplasmosis and three ml blood samples were tested to assess IgM and IgG by using ELISA kit. The specifics of the analysis and the laboratory results were included in an Excel chart and transferred to SPSS 21. In the initial Chi-square, the prevalence rate and the associated confidence intervals were calculated, which examined the possible effect of potential risk factors on the existence of toxoplasma serological markers.

Results: Of the 150 women who were pregnant Mosul, 40 (26.7%, 95 % CI) were reported to be T. gondii seropositive IgG antibodies and 9 (6%) borderline antibodies. T gondii seroprevalence for various age groups ranged from 18.50 to 29.90 %.

Conclusion: The results of the research suggest a considerably higher prevalence of seropositivity than studies in other countries. Home cats, undercooked foods, and unpasteurized milk were reported as threats to infection with gondii. The production of maternal toxoplasma knowledge to prevent undercooked foods, cats and unpasteurized intakes of milk during pregnancy is also recommended through a health education program.

Keywords: Seroprevalence, Toxoplasma, gondii, pregnant,the Risk factor

INTRODUCTION

Toxoplasmosis is a parasitic disease caused by a type of unicellular parasite called Toxoplasma gondii. This parasite is found in the feces of cats and undercooked meat. Therefore it is called cat disease, and the Toxoplasma parasite is one of the most common parasites spread around the world and this parasite can remain in the human body for a long time or even for life without causing any health problems[1-4]. A hematological analysis is performed to detect the antibodies of the toxoplasma parasite, and it must be noted that antibody is a type of protein that the human immune system produces when it is infected with certain harmful factors or organisms such as viruses, germs, parasites, and fungi, and when these antibodies are produced, they remain In blood circulation even after a recovery has occurred, to protect the body from recurring infection in the future[5-7].. Therefore, the presence of Toxoplasma antibodies in the blood indicates that a person has previously been exposed to the parasite at some point during his life and is then called positive, and sometimes when the test is positive The doctor may perform some other tests to know the time of the infection, and in the event of an effective infection in the pregnant woman, the doctor may examine the amniotic fluid and the blood of the fetus, and he may also perform an ultrasound to find out whether the fetus is infected or not infected, and when diagnosing an infection The fetus by toxoplasma The mother is referred to a specialist in addition to that, she may be asked to conduct a genetic consultation, as the option to end the pregnancy may be raised and discussed with the mother, according to the age of the pregnancy, and in the event of continuing pregnancy, some antibiotics are often prescribed to reduce the risk of the child developing symptoms of the disease[8,9]. To show the symptoms of cat disease can be divided into two main types, congenital cat disease: Congenital toxoplasmosis. This type of cat disease is meant as toxoplasmosis that is transmitted from the pregnant mother to her fetus during pregnancy, and it should be noted that this occurs as a result of the transmission of the parasite through The placenta is responsible for feeding the fetus, and in fact, these conditions can occur as a result of a woman getting cat disease during pregnancy or before pregnancy, and the infection of the fetus with this disease causes it to suffer from many disorders, although most of these cases are not accompanied by the appearance of symptoms or signs of Born, except here Some cases where symptoms appear, especially at the level of the retina, and the symptoms and signs that appear in newborns with this disease (weight loss from the normal limit. An enlarged liver or spleen. Jaundice. Inflammation is part of the retina of the newborn's eye, but can usually be cured. This inflammation alone and quickly, usually this does not affect the eyes of the newborn except in cases where the parasite infects the part known as macula retina). Acquired cat disease: About 80% of all cases of cat disease do not show any symptoms or signs, but concerning the few remaining symptoms that may appear symptoms, it should be noted that the symptoms usually appear after the incubation period that ranges between one to two weeks, and these symptoms are often the following: a slight increase in temperature. Swollen glands. Feeling tired and exhausted. Feeling pain in the joints or muscles. Headache. Sore throat. Skin rash. Blurred Vision[10-13].. During pregnancy, latent infection can cause reactivation. In combination with primary infection during pregnancy, it increases the risk of transplacental transmission. The risk of congenital infection is also more significant[14]. They have documented the seroprevalence of T. gondii in previous seroprevalence studies in Asian

countries. In India , Pregnant woman infection accounted for 41.8%[13], 41% in Iran[15] and 49% in Malaysia[16].Very few studies were performed Across Africa. Prevalence of T. gondii. They recorded seroprevalence levels in Mozambique from 18,7% to 46,0%[17-19], Benin 30%[19], Nigeria 40,8%[20] and Burkina Faso 20,3%[21]. Thorough knowledge of potential causes of this infection in some populations would be useful to prepare effective public health measures, those directed at food safety and food handling[22,23]. This study aimed to determine (T gondii) seroprevalence in pregnant women attending PHCs-(ANC), as well as to identify the infection risk factors.

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METHODS

It was cross-sectional, clinic-based research in PHCs between 1st November to 30th January 2020 In Mosul City. The estimation of sample size was determined using online Epi Tools. Whereas the prevalence rate (25%) based on the previous studies in the city of Mosul [24-25], with a 95% confidence interval. 150 pregnant women were interviewed and enrolled in this study.

Data collection: To examine the risk factors considered influencing toxoplasmosis, we developed a structured questionnaire that collects socio-demographic data on participant age, marriage duration, household residence, and monthly income. We gathered information on attitude and lifestyle (i.e. interaction with animals, undercooked meat consumption, unwatered fruit and vegetables consumption, consuming unpasteurized milk and/or water, hand washing after raw meat preparation, and garden exposure).

Procedure: The serum samples were tested by using ELISA (Enzyme Linked Immuno Sorbent Assay, Bioactiva diagnostic, Germany, Hamburg) Kit, as directed by the manufacturer) for IgM and IgG. IgM can be identified between two to four weeks after infection. For immunocompetent people, IgG persists for a lifetime period. The details from the survey and the laboratory findings have been loaded into an Excel chart and transmitted to the SPSS 21. The initial Chi-square test was based on the estimation of the prevalence rate and their respective confidence intervals (95%), which evaluated the potential effect of possible risk factors and the existence of toxoplasmic serological markers.

RESULTS

The mean age in years of the 150 women who took part in this study was 29.9 years (SD ± 5.5). Many women involved in the program (63.4 percent) were taught outside the primary school. The 150 pregnant women included in the report, 95 (63.3%) had one or more prior normal pregnancies and 55 (36.7%) had a bad history of obstetrics. Around 67(44.7 percent) at the time of this study, in their second trimester of gestation. Checking for T gondii totaled 150 serum samples. Serum samples were seropositive for T gondii, from 150 people. Gondiospecific IgG, with an average seroprevalence of 40 (26.75%)

Table 1: (T. gondii) seropositive. “Specific IgG and IgM antibodies”

IgM (%)			IgG (%)		
+ve	-ve	Borderline	+ve	-ve	borderline
0	150 (100)	0	40 (26.7)	101 (67.3)	9(6)
Total	150		150		

Table 2 association between the seropositivity of toxoplasmosis and some study factors (n =150)

Variables	Toxoplasmosis seropositivity			
	Yes%	No%	Chi	P
Age in years				
<20 year	13(27.7%)	34(72.3%)	2.965	0.48
> 20 year	57(55.3%)	76(73.7%)		
Gestational				
1st trimester	9(16.9%)	44(83.1%)	4.27	0.11
2nd trimester	19(28.3%)	48(71.7%)		
3rd trimester	12(40%)	18(60%)		
Residence				
Rt	21(28%)	54(72%)	11.64	0.47
Lt	19(25.3%)	56(74.7%)		
Income				
<250,000 ID	27(38.1%)	44(61.9%)	8.12	0.36
>250,000 ID	66(83.5%)	13(16.5%)		
Obese history				
Normal	5(5.3%)	90(94.7%)	41.58	.000*
BOH	35(63.6%)	20(36.4%)		
Education level				
≤ primary	36(37.8%)	59(62.2%)	15.72	.04
≥ secondary	51(92.8%)	4(7.2%)		
Cat ownership				
Yes	(2.7)3	(97.8)107	27.25	.000*
No	(52.5)21	(47.5)19		
Near cat touch				
Yes	(2.7)3	(97.8)107	15.307	.000*
No	23(57.5)	17(42.5)		
uncooked meat consumption				
Yes	0(0)	110(100)	9.211	.002*
No	9(22.5)	31(77.5)		
unwashed fruit or vegetable consumption				
Yes	4(3.7)	106(96.3)	35.915	.000*
No	27(67.6)	13(32.5)		
Unpasteurized milk intake				
Yes	1(0.9)	109(99.1)	18.297	.000*
No	15(37.5)	25(62.5)		
Hand washing after raw meat touch.				
Yes	110(100)	0(0)	46.35	.000*
No	13(32.5)	27(67.5)		
Garden Soil Touch				
Yes	1(0.9)	109(99.1)	41.491	.000*
No	26(65)	14(35)		
Untreated water Drinking				
Yes	0(0)	110(100)	19.853	.000*
No	26(65)	14(35)		

DISCUSSION

Toxoplasmosis is a severe infectious disease that is caused by an intracellular parasite called T. Gondii, what importance to public health. In order to understand the distribution and level of exposure to this pathogen, efforts to determine its seroepidemiology, particularly in high-risk groups such as pregnant women, are important. These data can be helpful in developing the control and prevention strategies for toxoplasmosis. The

seroepidemiology studies have shown that this parasite infects about 15-85% of the world's total population(24, 25). The current research was aimed to ascertain the T gondii exposure seroprevalence and related risk factors in Mosul city among pregnant women. This study demonstrated 26.7% IgG anti- (T. gondii) seroprevalence. Antibodies in women living in the City of Mosul. The results of previous studies in another Iraqi province indicate that in the LAT test the prevalence of toxoplasmosis was 42.6%(26), which is based on the findings of Al-Masoudi (27)who confirmed the infection rate of 49.7% while using the LAT approach for the toxoplasmosis screening test. LAT offers an excellent model for routine serology screening because of its high specificity, low cost and easy, but this approach can not differentiate between immunoglobulin groups and is not helpful in cases of suspected congenital infection if IgG response is to be differentiated from infants.(28). ELISA's findings in this Bakre's study from Iraqi Kurdistan showed that 23 out of 150 cases (15.3 percent) and 8 cases (5.3 percent) were positive for specific anti-toxoplasma IgG and IgM antibodies. This result was lower than seroprevalence toxoplasmosis studies in Sudan that performed by Khalil et al(29). which 45% of the population sampled had serological evidence of T. Infection with gondii, and higher than another study that performed in the same mentioned country which found that the overall of the overall prevalence of T. gondii infection in the study population was (27%)(30).Several previous studies have shown that women who live in the countryside, have low educational levels (31), those who eat well-cooked meat and women in contact with cats(12, 32-35) and those who drink water from public sources (12), have proven to be risk factors for cat disease. Therefore; these factors have appeared related to infection in this study. because the reason is that the war event in Mosul city destroy the basic institutions especially in Rt. side of city and samples of the study was a special category of the local community and can only be represented by a more extensive study. The current study found that cat ownership, near cat touch, uncooked meat consumption, unwashed fruit or vegetable consumption, unpasteurized milk intake, hand washing after raw meat touch, garden soil touch, "untreated water drinking were all to be risk factors for contracting T. gondii infection However, all of these factors was highly-significantin combination with serum-positive T. gondii in this study. can be explained by the fact that this was PHCs-based study, including a random selected group of pregnant women that may not represent the broader community". Further studies are needed, the establishment and comparison of serological T gondii spread among pregnant women from different environments. Longitudinal studies are also needed over the seasons of the year to determine the seasonality of toxoplasmosis during pregnancy. When compared this finding with other previous study found the undercooked eating meat was substantial risk factors, this study found the cat ownership was correlated with diseases, drinking water from public sources.

CONCLUSION&RECOMMENDATION

The study findings indicate a significantly higher prevalence of seropositivity than studies in other countries. Home cats occurred, undercooked meat and unpasteurized milk were identified as threats to gondii infection. A health education program is also recommended to develop maternal toxoplasma information to avoid undercooked foods, cats and unpasteurized milk intakes during pregnancy.

Ethical consideration: Before data collection, an official permission was obtained from the Ministry of Education/ Nineveh Directorate, and Written approval of participants was obtained prior to the start of data collection.

Conflicts of interest: Nil

Source funding: Self

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