

Risk factor of Toxoplasmosis among pregnant women attending to AL-Zahraa hospital in AL-Najaf Governorate

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الخلاصة

كان الهدف من هذه الدراسة تحديد معدل الإصابة بداء القطط ، الذين يعيشون في محافظة النجف-العراق. وقد أجريت هذه الدراسة من كانون الثاني 2016 حتى اذار 2016. كانت النسبة الكلية للإصابة بداء القطط (47.4%). وقد لوحظ أن أعلى معدل للإصابة بالطفيليات المعوية في الفئة العمرية (أصغر من 25 سنة) مع نسبة (59.3%)، وفي السكن أظهرت النتائج أن نسبة الإصابة بفيروس *T.gondii* كانت أعلى في المناطق الحضرية (83.3%)، في حين أن مستوى التعليم النتائج أظهرت أن أعلى معدل لانتشار الإصابة بفيروس *T.gondii* يحدث في المتخرجين من المدارس الابتدائية مع نسبة (38.9%)، وهذا التحليل الإحصائي لنتائج أظهرت انخفاض كبير ($\Rightarrow 0.05$) في العدوى *T.gondii* مع الدخل الشهري كافية بالمقارنة مع الدخل الشهري غير كاف. الحالة المهنية أظهرت أن أعلى حدوث للعدوى مع *T.gondii* يحدث في ربة البيت مع نسبة (8.3%)، وأبرز حوادث الإصابة *T.gondii* التي كانت السبب في دخوله المستشفى هو الإجهاض مع نسبة (81.5%) ، في حين أن حالة الصرف الصحي أعلى حدوث في الحفرة مع نسبة (57.4%)، كأعلى حدوث بسبب النساء التي لم تعقم الخضار والفواكه قبل الأكل مع نسبة (83.3%). نسبة عالية من النساء التي اكتشفت المرض بعد الحمل (81.5%)، كما كان طريقة انتقال المرض كان أعلى حدوث بواسطة القطط والتي تعمل في حديقة دون ارتداء القفازات عند العمل في الحديقة مع نسبة (51.9%) و(53.7%) و(90.7%) على التوالي. وكذلك ارتباط كبير بين تعامل مع القطط مع نسبة (29.6%). نسبة عالية من الإصابة *T.gondii* أظهرت بين النساء التي لديهن ولادات سابقة (74.1%). نسبة النساء التي أجرت تحليل الغلو بوليني المناعي (59.3) أعلى من النساء التي لم تجري تحليل الغلو بوليني المناعي. أوصى الباحثون استنادا إلى خلاصة الدراسة يجب أن يتم إجراء المزيد من الدراسات على التوكسوبلازما *T.gondii* لتحديد انتشار داء المقوسات في النجف، يجب أن تنفذ في وسائل الإعلام لزيادة المعرفة التلوث تجاه العدوى الطفيلية وحول انتقال المرض وكيفية الوقاية من مرض

Abstract- The aim of this study was to determine the incidence of Toxoplasmosis in pregnant women and to assess the possible risk factor associated with pregnant women living at Najaf Governorate-Iraq. This study was carried out from January 2016 until March 2016. Through the serodiagnosis of (114) pregnant women, the result shown that the (54) pregnant women were parasitic for Toxoplasmosis giving an overall infection rate (47.4%). The highest rate of infection with toxoplasmosis observed in the age group ≤ 25 years with the percentage of (59.3%), and in the residence the results showed that the percentage of infection with *T.gondii* was higher in urban areas (83.3%), while in level of education the result appear that the highest incidence of infection with *T.gondii* occurs in primary school graduated with the percentage (38.9%), The statistical analysis of the results shown the significant decrease (≤ 0.05) in *T.gondii* infection with sufficient monthly income compared to the insufficient monthly income. The occupation status shown

that the highest incident infection with *T.gondii* occurs in Housewife with the percentage (8.3%), And the highest incident of infection with *T.gondii* that was the reason for admitted to hospital is abortion with the percentage (81.5%), while sanitary condition the highest incident was pothole with the percentage (57.4%), as the highest incident due to women did not sterilize fruit and vegetables before eating with the percentage (83.3%). The highest incident of the women discover the disease after pregnancy with the percentage (81.5%), as the method of transmission of the disease was the highest incident was by his cats & do working in garden and do not wear gloves when working in garden with the percentage (51.9%), (53.7%) & (90.7%) respectively. As well as significant association with dealing a cats with the percentage (29.6%), and the higher percentage of *T.gondii* infection was seen among women have previously births (74.1%), and the proportion of women made the analysis IgM (59.3) higher than the women that

did not made IgM analysis. Based on the study conclusion, the researcher recommended further studies must be carried on the *T.gondii* to determine the prevalence toxoplasmosis in Al-Najaf , an mass media should be implemented to increase contamination knowledge toward parasite infections and about transmission of disease and how to prevention from disease.

Index Terms- Toxoplasmosis;pregnant women ;Toxoplasma gondii; Najaf -Iraq

I. INTRODUCTION

Toxoplasmosis is a parasitic disease that causes toxoplasmosis [1]Found worldwide, *T. gondii* is able to all warm blooded animals infected each [2], but felids such as domestic cats only final hosts known in the parasite, which can be subject to reproduction sexual [3] toxoplasmosis is one of the most common worldwide parasitic diseases. Horizontal transfer of *T.gondii* among humans occurs primarily in one of two ways, namely. Ingestion of infectious Toxoplasma oocyst from the environment .Or ingestion of tissue cysts, found in raw or uncooked meat. Can be vertical transmission of the infection toxoplasmosis acquired *T.gondii* happen newly pregnant women to the fetus through the placenta. Toxoplasmosis after natally acquired can cause severe inflammation of the brain by acute or latent activated in immune compromised patients infection [4]. And everywhere the source of the infection and the differential exposure of individuals to that, because of cultural and health habits, may explain why the prevalence of toxoplasmosis is extremely variable between countries and even within different regions of the same country [5-6]. One of the main causes of food borne death the United States is toxoplasmosis. It also represents the annual cost of the disease is about \$ 3 billion dollars in the same country [7]. Great variation in the prevalence of toxoplasmosis, which he described literature from studies conducted in different areas distinguishes a great change from the regional incidence of this disease, as well as the specific characteristics of each population studied [8-9]. Although both mother and congenital infection are often asymptomatic .The *T.godii* especially when infection occurred Primo during pregnancy [10].

And based on the diagnosis of infection load on serological tests that search for specific antibodies such as anti-*T. gondii*IgG, IgM and IgA. It is important to emphasize that the serological tests forIgM may show positive results continuously for long periods. Hence test greed inspector completed came during the first three months of pregnancy would help to determine whether it is the last infection [11]. Thus IgM positive test result in a pregnant woman requires caution and another confirmation of acute infection. In fetuses and newborns diagnosed with toxoplasmosis infection is complex and the Union through serological analysis and parasites. In newborns, anti- *T. godii*IgM and IgA in any titer, and anti- *T.godii*IgG titers ascending or detection of parasite DNA in the patient's blood to confirm the injury [12]. The aim of this research to determine the incidence of toxoplasmosis in pregnant women and assess the possible risks factor associated with pregnant women infected with toxoplasmosis .

II. METHODOLOGY

This study presents the research design used in the study, The setting of the study, the sample of the study, the study instrument, data collection, statistical data analysis and of the questionnaire.

Design of the study :

A descriptive analytic study conducted from December 2015 up to the September in order to assess the possible risk factor associated with their infection among pregnancy women.

Administrative arrangement:

Prior to actual collection data, formal administrative approval was obtained to conduct the study from following:-

- A- An official arrangement paper was obtained from the faculty of nursing.
- B- An official arrangement paper was obtained from theAI- Zahra Hospital

Setting of the study:

The study was carried out inAl-Zahra maternity hospital in Al- Najaf City.

The sample of the study:

Convenience (accidental) randomized simple sample consisted of (114) pregnant women infected&non infected with toxoplasmosis .

The study instrument:

A questionnaire was designed and constructed by the researchers , to assess Risk factors of toxoplasmosis in pregnant women.The final copy of the questionnaire consists of two main parts are:

Part I: demographic characteristics to patients attending in maternity unit

The first part of the checklist consists of (7) items relative to demographic data of patients receiving treatment in obstetric lounge and room Alchortaj operations . Theses concerned personal information as data demographic include :name, age , residence ,level of education, monthly income, occupation ,floor of the house.

Part II: Medical information concerning pregnant women

The second part of the checklist (10) items these items include: reason for your visit to the hospital, sign and symptoms are appearance during your injury disease, discover the disease before or after the pregnancy, way in which the disease transmitted to you, treatment that are given to patient, Having previously births, Having a previously abortion cases, Do you made analysis of the IgG after the infections,sanitary conditions,(source of drinking water , wish hands before eating , washing fruits and vegetables before eating , work in garden,dealing domestic animals, Wear gloves when working in garden, Dealing with a cat, Eating raw meat).

Data collection :

They were collected through use of semi-structured with questionnaire interview technique with each study subjects

Statically data analysis:

A descriptive statistical methods (parametric method for percentages, frequency and mean). and inferential statistical method (chi-square) were used to analyze the data.

Validity of the questionnaire:

The validity of the questionnaire was determined by the panel of experts to investigate the content of the questionnaire. the experts add some items and finally they all agree upon the items of the questionnaire.

III. RESULTS

Through the serodiagnosis of (114) pregnant women participated in this current study have shown that the (54) pregnant women were positive for toxoplasmosis ,giving an overall infection rate (47.4 %) as shown in table (1).

Table (1): percentage of infection rate with toxoplasmosis among infected women

Pathogenic	No. of specimens infected	Infection %
Toxoplasmosis	54	47.4
Other	60	52.6
Total	114	100

The current study have shown that the highest incident of infection with *T.gondii* occurs in age group ≤25 years with the percentage of (59.3%) .while the lowest infection occurs in the age group 36 Up years with the percentage (11.1%) ,as shown in figure(1).

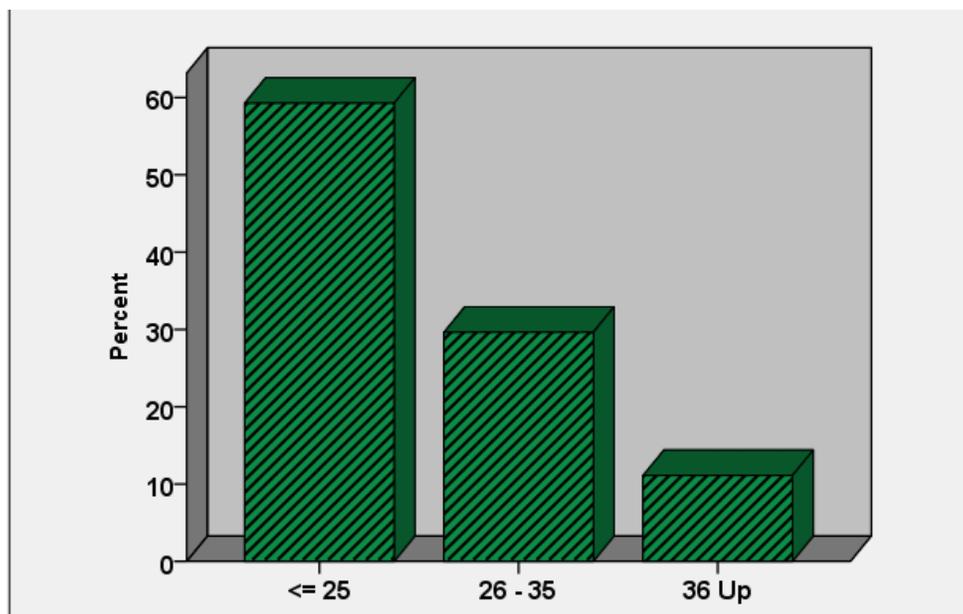


Fig.1- Percentage of infection with Toxoplasmosis based on age groups.

The residence the results showed that the percentage of infection with *T.gondii* was higher in urban areas (83.3%) than rural areas (16.7%) . as shown in figure(2).

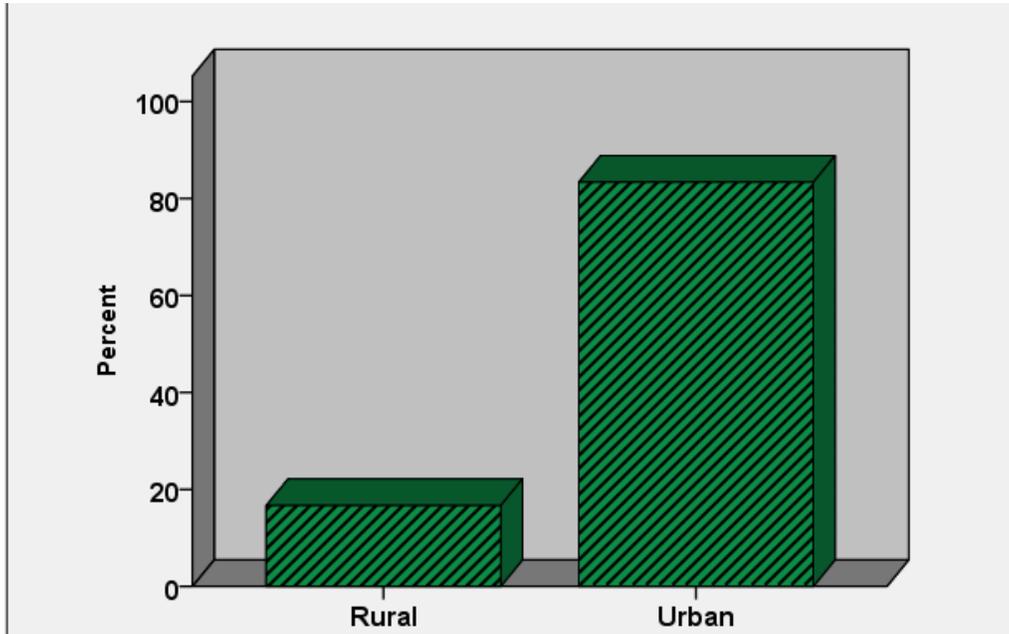


Fig.2- Percentage of infection with Toxoplasmosis according to the residence.

The result appear that the highest incidence of infection with *T.gondii* occurs in primary school graduated with the percentage (38.9%) while the lowest infection occurs in the preparatory school graduated with the percentage (3.7%) . as shown in figure(3).

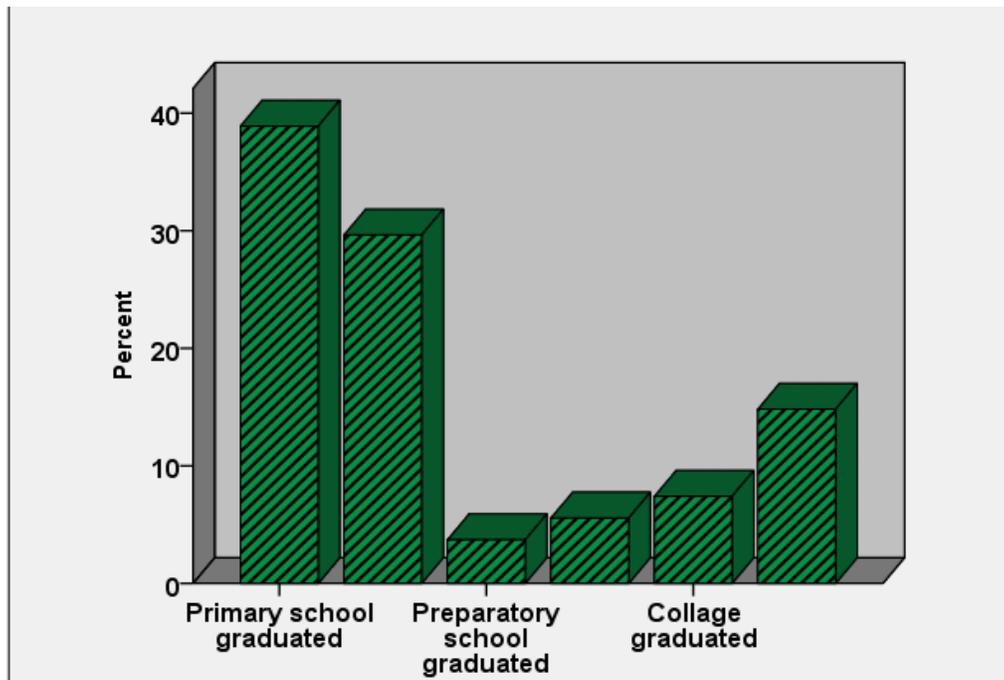


Fig.3- Percentage of infection with Toxoplasmosis based on a Level of education.

This statistical analysis of the results shown a significant decrease($P \leq 0.05$) in *T.gondii*infection with sufficient monthly income compared to the insufficient monthly income, as shown in figure(4).

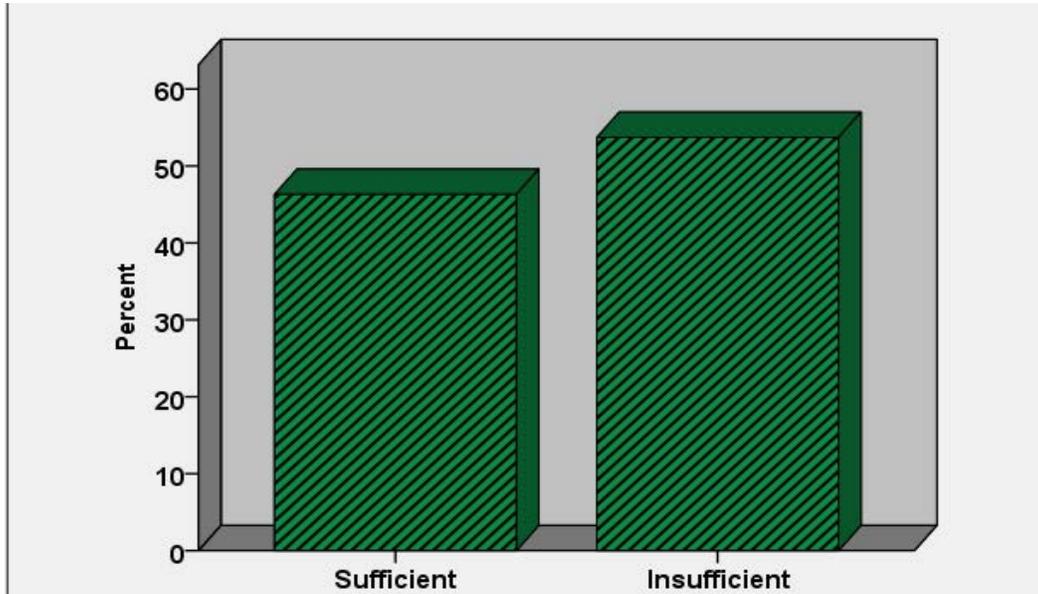


Fig.4- Percentage of infection with Toxoplasmosis according to the monthly income.

The occupation status shown that highest incident infection with *T.gondii* occurs in Housewife with the percentage(8.3%) , while the lowest infection occurs in student with the percentage (1.9%) ,as shown in figure(5).

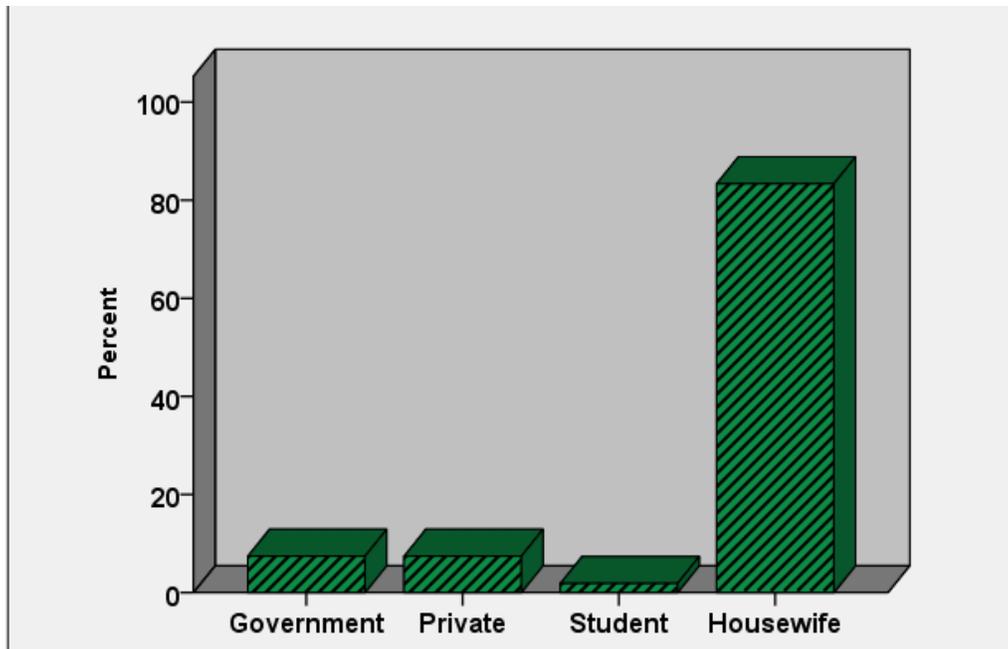


Fig.5- Percentage of infection with Toxoplasmosis according to the occupation status.

The significant analysis of the floor of the house shown significant decrease ($P \leq 0.05$) with *T.gondii* infection occurs in sand type (5.6%) compared to the floor other type (40.7%) . as shown in figure(6).

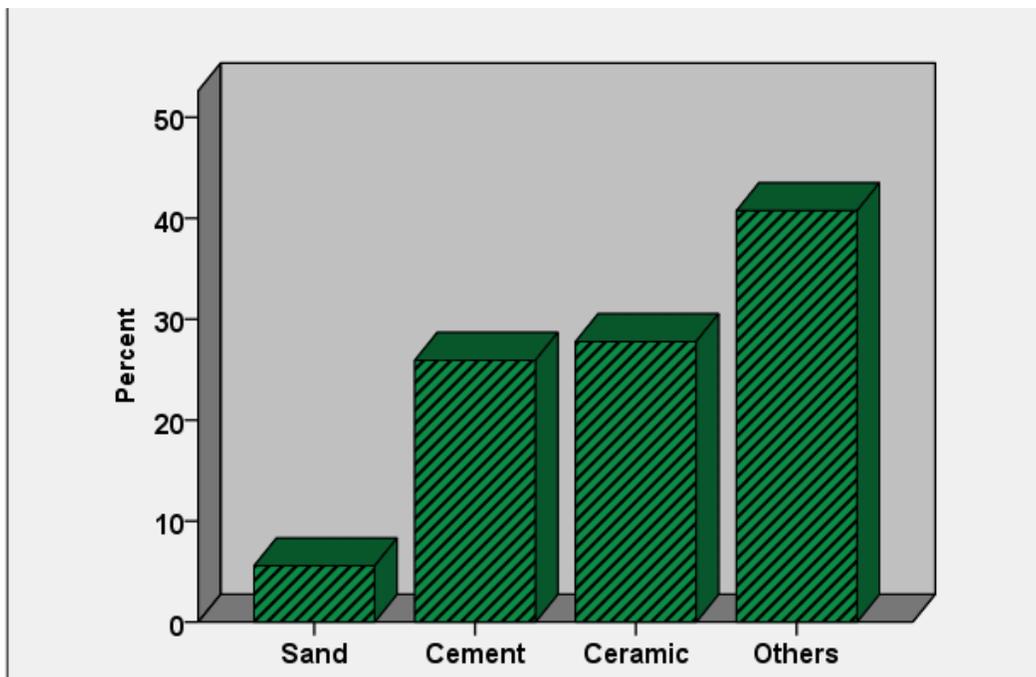


Fig.6- Percentage of infection with Toxoplasmosis based on floor of the house.

As shown in table (2) have shown that the highest incident of infection with *T.gondii* that was the reason for admitted to hospital is abortion with the percentage (81.5%) and less incident is birth with the percentage (18.5%), the highest incident due to women did not sterilize fruit and vegetables before eating with the percentage (83.3%), The highest incident of infection with *T.gondii* occurs in First-Trimester with the percentage of (64.8%) lowest infection occurs in the Third-Trimester with the percentage (16.7%) the method of transmission of the disease was the highest incident was by his cats with the percentage (51.9%) and less incident with the percentage (1.9%), while sanitary condition the highest incident was pothole with the

percentage (57.4%) and less incident is sewage pipe with the percentage (42.6%), drinking water source was less incident RO water with the percentage (7.4%) and higher incident pipe water with the percentage (92.6%) as, the highest incident of the women discover the disease after pregnancy with the percentage (81.5%) and less incident discover before pregnancy with the percentage (18.5%), The proportion of women who did not know the name of the medicine and they who high incident 83.3% and who know the drug is taken and they are intellectuals from the academic side but they who less accident with the percentage (16.7%).

Table(2) Percentages for medical information and pregnant women infected with toxoplasmosis

Categories	Frequency	Percent %	
What is the reason for your visit to the hospital?	Birth	10	18.5
	Abortion	44	81.5
Washing fruits and vegetables before eating?	Without sterile	45	83.3
	With sterile	9	16.7
When are you infected with the disease?	First-Trimester	35	64.8
	Second-Trimester	10	18.5
	Third-Trimester	9	16.7
What is the way in which the disease transmitted to you?	Cats	28	51.9
	Contamination Food and water	26	48.1
What is sanitary conditions?	Pothole	31	57.4
	Sewage pipe	23	42.6
Source of drinking water?	Pipe water	50	92.6
	Ro water	4	7.4

Do you discover the disease before or after pregnancy?	After pregnancy	44	81.5
	Before pregnancy	10	18.5
What are the treatments that given to you?	0	45	83.3
	Pre-cap	9	16.7

$\chi^2 = 9.703$ $P = 0.0068$ $P < 0.05$ significant

As shown in table (3) the highest incident of infection with *T.gondii* occurs in women working in garden with the percentage of (53.7%) compared with women do not working in garden (46.3%). and show the highest incidence in women do not wear gloves when working in garden (90.7%), while the less incident of infection in women wear gloves (9.3%). while the dealing with domestic animals the highest incident with the percentage (75.9%) and less incident with women do not have domestic animals (24.1%). As well as significant association with dealing a cat infection with *T.gondii* due to women dealing a cat

with the percentage (70.4%) As well as significant association with dealing a cats with the percentage (29.6%). A small percentage of the women that eat raw meat (7.4%) but the high percentage in women do not eating raw meat (92.6%). woman that have the signs and symptoms during pregnancy have higher percentage (64%) . and the higher percentage of *T.gondii* infection was seen among women have previously births (74.1%). The proportion of women made the analysis IgG (59.3) higher than the percentage of the women that did not made IgG analysis (40.7%).

Table (3): percentage of some risk factors among women infected with toxoplasmosis

Categories	Frequency	Percent	
Do you work in garden?	Yes	25	46.3
	No	29	53.7
Wear gloves when working in garden?	Yes	5	9.3
	No	49	90.7
Do you dealing domestic animals?	Yes	13	24.1
	No	41	75.9
Dealing with a cat?	Yes	38	70.4
	No	16	29.6
Eating raw meat?	Yes	4	7.4
	No	50	92.6
Are there signs and symptoms are appearance during your injury disease?	Yes	35	64.8
	No	19	35.2
Having previously births?	Yes	40	74.1
	No	14	25.9
Having previously abortion cases?	Yes	31	57.4
	No	23	42.6
Do you made analysis of the IgG after the infections?	Yes	32	59.3
	No	22	40.7

$\chi^2 = 5.33$ $P = 0.0234$ $P < 0.05$ significant

IV. DISCUSSION

The present study found that the seroprevalence of Toxoplasmosis-related disease with age and the highest percentage recorded in the age groups of 25 and less, perhaps because there is a greater possibility of contact with the oocyst of Toxoplasma through professional activity, public parks, etc. These results are consistent with the others reported studies. in contrast, some authors have been reported in the age-related Toxoplasma spread of these seroprevalence in several studies of different populations around the world increases [17-19].

It also could explain the trends of the times from the impact of the group [17,20], and the risk of toxoplasmosis infection may be greater in the past due to the use of frozen meat was less

common and practices of animal husbandry has improved afterwards. [21]

The study showed an association between residence in the urban site and toxoplasmosis infection. Thus, in the rural areas of the c Najaf city, the average prevalence rate of 16.7%, compared with 83.3% in urban areas as a result. This was not in agreement with those reported by other studies, which reported that the incidence in the rural area was more common [21].

This study confirms that the educational level, the social and economic situation of danger for the result toxoplasmosis. This corresponding to the result of factors [22] and that of [23], who said increased education of health and public professionals about the specific factors in this study can help to increase the ease the burden of toxoplasmosis in the society. And linked to low levels

of education with the social and economic situation and probably less due to work in jobs with increasing soil exposure. It was split monthly income of the professional women and their husbands into two groups. The high prevalence (53.7%), while less income group was (46.3) in the other group. This result is similar to other studies indicated that the seroprevalence of IgG was high in the low-income women [19]. Low monthly income and live in poor housing conditions.

Seroprevalence of toxoplasmosis lifting of the occupation that the prevalence of toxoplasmosis was higher among housewife (83.3%), while it was seen as a low prevalence of the Seroprevalence in the number of students (1.9%) and others (5.9%). There was a statistically significance difference in spread between the different categories of occupation, this may be due to the housewife more exposure to the causative agent of the disease. The results of this study are similar to those observed in the study to investigate the knowledge of toxoplasmosis in pregnant women where found that knowledge levels were low [21]. The study shows that the seroprevalence of *T. gondii* infection was low (5.6%) in the sandy ground and was higher than it was in the floor of ceramic and other (27.8%, 40.7%) respectively as a result. This was not seen in many previous studies that said that *Toxoplasma* exposure been associated with low socioeconomic status [20,21]. Our study demonstrated that (85.5%) of the infected women came to the hospital because of abortion, while (18.5%) as a result of birth. In this study, we investigated the potential using a pretested questionnaire risk factors. What is interesting, we have noticed a positive spread of the Seroprevalence. In contrast, a few number of pregnant women has not been investigated.

In this study, has been identified for consumption of vegetables treated with untreated water as well as a risk factor seropositivity. This for compatibility with a previous study indicated that raw vegetables consumption should factor is the risk of infection [15], but we disagree with others that said that the behavior of feeding did not appear relationship with *T. Toxoplasma* infection. It was pointed out that toxoplasmosis can be transmitted to humans through ingestion sporulated oocysts in water and food. [20]

Transmission placenta rate is depending on a variable for gestational age study time maternal infection. This recorded that 64.8% of women with the disease in the first semester, 18.5% in the second term and 17.6% in third term. This result is consistent with other studies that he said that the toxoplasmosis is only a risk to the fetus if he was arrested for the first time during pregnancy or within a few weeks prior to pregnancy. Later in pregnancy, it is the most common injury to be passed to the child. For example. If the patient has become around the time of pregnancy, and there is less than a 1% chance that the child will also develop the infection but, if you become infected during the third trimester of pregnancy (27 week until the birth), there is a chance of 70% that your child will also be getting infected. However, infected children during and after pregnancy is less likely to develop serious health problems stage [16]. The study revealed that owning cats have been proven to be a danger to human disease toxoplasmosis factor, and we have seen this in many previous studies [17,21,22] Although other studies have shown that contact with cats is not a risk factor for *Toxoplasma* infection in certain sectors of the population [18,20].

Epidemiologically, there are many stray cats that live on farms, it is allowed to roam freely. This may contaminate the environment with the oocyst, which can infect cattle that will be later slaughtered for human consumption [24]. Another important risk factors that are still associated with congenital toxoplasmosis in the final model was drinking untreated water and boiled. According to several studies such as the Association it has been reported. Water as the main risk associated with *T. gondii* seropositivity factor in population groups in social and economic levels, middle or low. The risk of toxoplasmosis infection during pregnancy is very low. Some studies have shown that when women are not immune (those who have not had the infection before), and about 5 in 1000 may get a *Toxoplasma* infection, with the risk of 10-100% of the transmission to the baby. The study suggested that, in the United Kingdom, and generates about three in every 100,000 babies are born with congenital toxoplasmosis [25]. This does not interfere with the result we have this record (81.5%) of the cases after pregnancy to diagnose occur during pregnancy, but the infection may have happened before this time.

It can be transmitted *Toxoplasma* infection to humans through ingestion or inhalation of the oocyst from the environment through the sponsorship of agriculture, and this work showed that the contact with the soil, gardening and soil-related professions has proven to be risk factors for toxoplasmosis. The relationship between residence in a small town / village and the presence of toxoplasmosis may reflect more frequent contact with the soil through agriculture and public gardens in the rural areas, which explains in another study.

Pets can act as mechanical vectors by rolling in foul-smelling material and eating fecal material [19], and that we disagree with our result, which does not show any correlation between seroprevalence *T. gondii* infection and host animals. The present study show that the seroprevalence of *T. gondii* infection was high (70.4%) with a cat. This owning a result that was seen in many previous studies that said that stray cats represent a high risk of toxoplasmosis. Cats often spread the oocyst out of the house, and cats may be responsible for a large part of the environmental pollution with eggs sporulated oocysts to maintain the infection for a long time in the water or soil [17]. Other studies show that the presence of host animals (cats) in the house and confirmed that there is a risk of toxoplasmosis only when the previous pregnancy women said. This result shows that the simple fact of having animals at home is not enough to gain a protozoan infection, and that there must be contact with other infected sources to be contaminated and weaknesses of higher current neighborhood invader of the organism. Not case-control study conducted in multiple centers of Europe cats do not know as a risk factor for seroconversion during pregnancy [27].

Types of meat products associated of *Toxoplasma* different transfer in humans with different eating habits. A national survey of pregnant women and found that many women were not aware of the risk of toxoplasmosis disease associated with meat is cooked well [21]. It is important that pregnant women and people suppress the immune system does not eat undercooked meat and follow the guiding principles of safe, cooking [19]. In addition, you should avoid unpasteurized goat's milk and untreated water. [24] Because deep freezer (-12 ° C or less) usually kills *T. gondii* cysts in meat [16], and the people

who often eat frozen meats cooked in a microwave oven may have less risk of infection with Toxoplasmosis . As mentioned above, however, if it is not to freeze the meat enough, T.gondii cysts can remain viable. Adequate freezing (-12° C or less for at least 24 h) will inactivate T.gondii cysts , but remained cysts viable for > 11 days at -6.7 ° C [23]. This result shows that the baby is the most vulnerable to infection toxoplasmosis if the mother with signs and symptoms. The degree of risk to the fetus, and the damage caused, depending on when in the pregnancy for the mother acquired the infection, and if you get toxoplasmosis in the early stages of pregnancy, there is a greater risk of miscarriage, still births or birth defects. It's rare for the injury to be passed to the baby during early pregnancy, but if it does it can cause serious health problems [18].

Our study indicated that the previous pregnancy showed that the biggest risk factor for toxoplasmosis in the study population. He has already confirmed in another study conducted on women as passive and found themselves among the population analyzed in this study [27]. The existence of pregnancy increases the risk of acquiring toxoplasmosis, were 2.2 times higher for pregnant women in general, and 7.7 times higher for pregnant women [26]. Our work shows that women provide abortions have a higher risk of the disease toxoplasmosis women is aborted earlier. This weakness is greater than pregnant women, the parasite is probably due to changes in the underlying immune mechanisms in pregnancy, caused by inhibition of the immune response because of the need for tolerance to the graft (the fetus) and / or as a result of the imbalance in the distinctive hormones of pregnancy [27].

Our study has several limitations. First, a high proportion of low IgM against T. gondii enabled us to achieve all the risk factors in pregnant women positive IgG, and therefore has failed to determine a causal association between the direct incidence and risk factors of importance. The conclusions finally gained modern knowledge study on toxoplasmosis infection that the implications of women, from a health problem in Iraq, the relationship between Toxoplasma infection and demographic data, a significant role between Toxoplasma infection and hygiene and the important role of health and infection toxoplasmosis.

The recommendations of this research should be on health care providers educate pregnant women at the first prenatal visit at the health food. The government and meat industry must continue its efforts to reduce Toxoplasma in meat. Pregnant women should wear gloves when gardening and during any contact with soil or sand After gardening or direct contact with soil or sand, wash your hands thoroughly. To prevent foodborne illness and other food toxoplasmosis, you should cook food to a safe temperature grades

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