



## Prevalence of Toxoplasma infection among pregnant women in Al-Qadisiyah province according to hospital records

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### Abstract

Statistics were collected from the Obstetrics and Gynecology Hospital in the Diwaniyah Governorate Center and some clinics in the suburbs, where the statistical results of 90 examinations were conducted on the serum of women with toxoplasmosis in Diwaniyah Governorate. Where 45 samples were examined with the latex test, and the percentage of positive samples was 84%, while the ELISA-IgG test was 75%, as 20 samples were examined with this test ... As for the ELISA-IgM test, the highest infection rate was 88% for the 25 samples that were examined. While the current test results using the latex test showed a high rate of infection in ages between 15-25 years, where the infection rate was 90% of the total samples examined. The lowest percentage was 70% in the age groups of 35-45 years. And by using the IgG ELISA test – the infection rate was high in ages between 5-25 years, where the infection rate was 85% of the total samples examined. And the lowest rate was 60% in the age groups of 35-45 years. The results of the test using the IgM ELISA test – a high incidence rate for ages between 25-35 years, where the infection rate was 83% of the total samples examined . And the lowest rate was 60% in the age groups of 35-45 years. The study included the prevalence of Toxoplasma infection between women in Al-Diwaniyah governorate. The data of obstetrics and gynecology hospital records by latex test. The test results showed a 90% infection rate in the sub-districts, while in the center the infection was 78%.

**Key word:** - toxoplasmosis - pregnant women - Toxoplasma infection

### Introduction

Toxoplasma, which usually infects humans without symptoms in adults, but it causes significant health problems for pregnant women, especially to the fetus, cause many symptoms such as mental retardation, blindness, small head size, or may lead to death or hydrocephalus (1). Although the rate of transmission of the disease from the pregnant mother to the fetus tends to decrease in the early stages of pregnancy, the severity of the fetus's impact on the disease is high when it is infected in the early stages of pregnancy and results in the death of the fetus in the womb or during the birth period, as the early infection associated with fetal death or miscarriage. But if the fetus is infected in the second and third months of pregnancy, it is normal at first, and

symptoms do not appear until 4-12 weeks after birth (2; 3). Infection occurs in different ways, including by ingesting food contaminated with the feces of infected cats, or by eating undercooked meat or tissue bags, or the infection may be transmitted from the pregnant mother to the fetus through the placenta, and often occurs during the acute phase of the disease through rapid phase transmission.(4). Cats have a key role in the spread of parasite infection. Infected cats continue to release large numbers of egg sacs to the external environment, which retain their ability to infect and have the ability to infect humans and all animals at a constant temperature.(5)



## Materials and Methods

Blood samples were collected from pregnant women attending the General Hospital for the period from 1\1\2022 Until 1\12\2022, venous blood samples were collected at a rate of 5 ml for each sample, and blood samples were placed in test tubes. A capacity of 10 ml, the

samples were separated by using a centrifuge at a speed of 1000 rpm for 5 minutes. Enzyme-linked immunosorbent assay (ELISA) was used as a method for the direct identification of infectious pathogens according to the instructions from the manufacturer.

## Results

The statistical results of 90 examinations conducted for the serum of women infected with toxoplasmosis in Al-Diwaniyah Governorate, where the statistics were collected from the Obstetrics and Gynecology Hospital in the center of Al-Diwaniyah Governorate and some clinics in the suburbs. The research form was adopted to collect samples, which collected most of the information about the patient suffering from toxoplasmosis. The current study showed the

results of the immunological examination of 90 samples of women in Al-Diwaniyah Governorate, where 45 samples were examined using the latex test, and the percentage of positive samples was 84%. The highest incidence of IgM infection was 88% for 25 samples that were examined. This study was higher than that of other governorates ELISA - IgM, the infection rate was 88%, and as shown in Table (1),

**Table (1): The relationship between Toxoplasmosis infection positive samples in ELISA test**

Percentage %	Positive sample	Sample no.	Test type
84	38	45	Latex test LAT
75	15	20	ELISA_ IgG
88	22	25	ELISA_ IgM

The results of the current test using the latex test showed a high rate of infection in the ages between 15-25 years, where the infection rate was 90% of the total samples. The lowest percentage was 70% in the age groups from 35-45 years, the highest percentage was recorded within the age group 20-30 years, highest percentage within the age group 23-26

years. The highest percentage was recorded within the age group 19-35 years, while, age group 25-35 years, using the latex test and examination

ELISA - IgG is due to the longer exposure to parasite-related risk factors, which increases the incidence of chronic infection as shown in table (2)

**Table (2): The relationship between Toxoplasmosis infection and age in year using ELISA-IgG test**

Percentage %	Positive sample	Sample no.	Age in year
90	18	20	15-25
86.6	13	15	25-35
70	7	10	35-45
84	38	45	45-55



The results of the current test using the ELISA was 85% of the total samples examined.. The test showed a high infection rate in the ages lowest percentage was 60% in the age groups between 15-25 years, where the infection rate from 35-45 years as shown in table (3)

**Table (3): The relationship between toxoplasmosis infection and age in year using EIISA-IgM test**

Percentage %	Positive sample	Sample no.	Age in year
85.7	6	7	15-25
75	6	8	25-35
60	3	5	35-45
75	15	20	45-55

The results of the current test using the ELISA test showed a high rate of infection in the ages between 25-35 years, where the infection rate was 83% of the total samples examined, and the lowest percentage was 60% in the age groups from 35-45 years as shown in Table (4).

**Table (4): Show rates of toxoplasmosis infection in age groups by using ELISA test**

Percentage%	Positive sample	Sample no.	Age in year
69.2	9	13	15-25
83.3	10	12	25-35
60	3	5	35-45
88	22	25	45-55

The study included the spread of infection in Al-Diwaniyah Governorate and its districts. The results of the test showed a 90% infection rate in the districts and sub-districts, while in the center the infection was 78%, as for the ELISA-Ig test, where all samples were infected, a high infection was recorded 100% in the districts and sub-districts. In the center, the rate of infection was 64%. The results of this study also showed the spread of the Toxoplasma parasite using the latex test and ELISA IgG \_ in geographical areas with high population numbers such as cities, where the highest infection rate was in the city center of Diwaniyah 73.1% and in. That individuals in the city are more affected than the rural population and that the percentage of infection is in the city It is greater than in the countryside, and that the reason for the high rate of infection among women in the center of Al-Diwaniyah city compared to pregnant

women in rural areas is due to the fact that the main factor in the high rate of infection among women in the districts and sub-districts is the low health culture and lack of health awareness, as well as women's care for field animals and the spread of stray animals (cats and dogs) . In these areas, the concentration of Toxoplasma egg sacs is very high, and thus the risk of human infection increases, while we noticed the injuries in the city center have increased recently and are almost close to the injuries of the districts and sub-districts, due to the increase in the breeding of domestic pets, including cats and dogs, which are the mediator of the infection. Also rural cats have large areas to throw parasite egg sacs, and thus the egg sacs are concentrated less than the previous case, so the risk of infection in population groups decreases In the Countryside as shown in the table (5)

Table (5):



%	ELISA_IgG		%	ELISA_IgM		Latex		Living	
88	15	17	64	9	14	78	18	23	Center Governorate
87.5	7	8	100	6	6	90.9	20	22	Districts & sub-districts
88	22	25	75	15	20	84	38	45	Sum.

## Discussion

The current study showed the results of the immunological examination of 90 samples of women in Al-Diwaniyah Governorate, where 45 samples were examined using the latex test, and the percentage of positive samples was 84%. The highest incidence of IgM infection was 88% for 25 samples that were examined. This study was higher than that of other governorates. (6) in Al-Qadisiyah governorate found 125 serum samples from pregnant women with an infection rate of 62.4% when using the latex test and with the study. (7) in Al-Qadisiyah governorate on 147 serum samples from pregnant women in urban and rural areas using the latex agglutination test, the infection rate was 60.86%, respectively, and this percentage was higher than what was found by diphtheria (8) in Wasit governorate when using the latex test. The infection rate was 60.31%, and (9) in Baghdad, the infection rate was 60.21%. In the study conducted by (10) Dhi Qar governorate, it was found that the seroprevalence of toxoplasmosis in aborted women is 60.62% using the latex agglutination test and 52.28% infection rate in Kirkuk city (7). In other regions of the world, this result of the free study was higher than what was found by (1) in the United States of America, with an infection rate of 15%, and what it found (2). It reached 41% in Korea. The difference in infection rates using the LAT test is due to the difference in the availability of appropriate environmental conditions for the survival and spread of the parasite, the difference in cultural and social habits, the

difference in health awareness, as well as the genetic predisposition of the patient. (11) 75%, and as shown in Table (1), this percentage is higher than what was recorded by Abu (12) in the city of Erbil with a rate of 60.3% using the ELISA-Ig assay, and (13) in the city of Sulaymaniyah with an infection rate of 65%. Infection using the ELISA-IgG test is due to previous exposure to risk factors for Toxoplasmosis infection and the occurrence of chronic toxoplasmosis infection, and the accuracy of using serological tests on the one hand, or to the number of samples examined on the other hand, leads to different rates of infection using the test, (14) ELISA-IgG. ELISA-IgM, the infection rate was 88%, and as shown in Table (1), this percentage is higher than what was recorded by (15) in the city of Sulaymaniyah, with an infection rate of 35%, and (16) in Wasit governorate with an infection rate of 24.12%, and (8) in Wasit Governorate, with an infection rate of 31%. And higher than what was recorded by (17) in Al-Qadisiyah Governorate, with an infection rate of 17.6%. The results of the current test using the latex test showed a high rate of infection in the ages between 15-25 years, where the infection rate was 90% of the total samples. The lowest percentage was 70% in the age groups from 35-45 years, and this is close to what (18) recorded. In Diyala governorate within the age group 30-35 years, and with what (15) recorded in the city of Sulaymaniyah if it recorded the highest percentage within the age group 21-29 years



old, and with what was recorded by (19) in the governorate of Hilla, if the highest percentage was recorded within the age group 20-30 years, and with what was recorded by (20) in Najaf governorate recorded the highest percentage within the age group 23-26 years, and with what was recorded by (21) in Kirkuk governorate if the highest percentage was recorded within the age group 19-35 years, (22) in Dohuk, if the highest percentage was recorded within the category, the reason for the concentration of the higher rate of Toxoplasmosis infection in women, especially within the age group 25-35 years, using the latex test and examination ELISA - IgG is due to the longer exposure to parasite-related risk factors, which increases the incidence of chronic infection (23) as shown in table (2). This is similar to what Al (18) in Diyala governorate within the age group 30-35 years, and with what (15) recorded in the city of Sulaymaniyah if he recorded the highest percentage within the age group 21-29 years old, and with what was recorded by (19) in the governorate of Hilla, if the highest percentage was recorded within the age group 20-30 years, and with what was recorded by (20) in Najaf governorate recorded the highest percentage within the age group 23-26 years, and with what was recorded by (21) in Kirkuk governorate if the highest percentage was recorded within the age group 19-35 years, (22) in the city of Dohuk, if the highest percentage was recorded in the category, the reason for the concentration of the higher rate of Toxoplasmosis infection in women, especially within the age group 25-35 years, using the latex test and examination ELISA-IgG is due to the longer exposure to parasite-related risk factors, which increases the incidence of chronic infection (23). Also, the absence of acute infection within the age group 40-50 years may be due to the role of immunity for women in the age of forty that

differs from what it is in the age of twenty, which is less in response to the immune response, both cellular and humoral, but these percentages do not necessarily mean that the infection is limited One age group without another. Perhaps the reason for the increase in the incidence of this age group is that most marriages in our society occur after the age of twenty, and the reproductive age falls in that period of life. Hence, we see that most pregnant women's visits to hospitals and clinics are those who are over their age Twenty (24) Al-Hamza district, the infection rate was 70.58%, using the latex test, and as using the ELISA\_IgG test. The highest rate of infection with the Toxoplasma parasite in Hamza district 43.13% and in Shamiya district 32.35%, the results of the current study agreed with what was recorded by (25), (20) and (15). That individuals in the city are more affected than the rural population and that the percentage of infection is in the city It is greater than in the countryside, and that the reason for the high rate of infection among women in the center of Al-Diwaniyah city compared to pregnant women in rural areas is due to the fact that the main factor in the high rate of infection among women in the districts and sub-districts is the low health culture and lack of health awareness, as well as women's care for field animals and the spread of stray animals (cats and dogs) . (26) The difference in the prevalence of infection in different areas of Al-Qadisiyah governorate and even within the city itself is due to women living in polluted environments (27) and to the different individual and the different types of basic health care for pregnant women and genetic predisposition or increased resistance to transmission of the disease and different tests serology and the accuracy of its use on one hand or the number of samples examined on the other (28)



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