Knowledge of Iraqi Pregnant Woman about Toxoplasmosis and their Practice Towards Its Prevention

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Abstract

Toxoplasmosis is an infectious disease caused by *Toxoplasma gondii* and transmitted to humans by consumption of raw meat or foods contaminated with feces of infected cats. Infection during pregnancy may be transmitted to the fetus causing significant morbidity and mortality. This study is a cross sectional study conducted on (98) pregnant women attending Babylon Maternity and Pediatrics Teaching Hospital during February 2019 who are aged (17-40) years with a mean age of (25.0 ± 4.9), and aims to evaluate their knowledge about the disease, its role in pregnancy, effects on the fetus, and their practice toward its prevention. Significant knowledge difference was found between urban and rural residents. Similarly, educational level had significant impact on knowledge. In conclusion, the study found that Iraqi pregnant females have medium knowledge about toxoplasmosis, but have poor knowledge about its vaccine. However, their practices are generally good in favor of preventing its transmission.

Keywords: Toxoplasmosis; pregnancy; awareness

1. Introduction

Toxoplasmosis is an infectious disease caused by the protozoan *Toxoplasma gondii*[1]. This disease is present worldwide, and affects both immunocompetent and immunocompromised persons, leading to significant ocular disease, destructive cerebral disease, or even severe life-threatening conditions[2]. This disease is transmitted to humans by consumption of raw or undercooked meat which contains living cysts or oocysts of the protozoan *Toxoplasma gondii*, or by consumption of food or water that is contaminated with feces of infected cats[3].

Infection with *Toxoplasma gondii* during pregnancy may lead to the transmission of the disease to the developing fetus. This transmission occurs mainly if women who acquire the infection during gestation[4]. This transmission to the fetus cause significant impact on the health of the fetus and newborn, and can lead to debilitating and life-changing consequences such as mental retardation, loss of vision, epilepsy, and even death[5].

Various risk factors were identified by epidemiological studies, and main risk factors include: owning domestic cats[6], living in areas that are populated with seropositive cats, especially in farms[7], consumption of raw or undercooked meat[8], poor hand hygiene[6], as well as contact with soil[9].

Prevention of toxoplasmosis is mainly achieved by utilizing the general prevention measures targeted towards risk factors mentioned earlier. These measures include[10]:

- Cooking meat thoroughly to a temperature sufficient to kill the *Toxoplasma gondii* protozoa.
- Washing fruits and vegetables thoroughly before consumption.- Good cleaning of cooking tools and surfaces that were used for handling raw meat or unwashed fruits and vegetables. - Prevent pregnant women from handling cat feces[10].

Serological screening of women in reproductive age for the presence of *Toxoplasma gondii* antibodies can allow for early detection of susceptible women as a part of a wide prevention program[11].

2. Aim of the Study

To evaluate the knowledge of Iraqi women about toxoplasmosis disease, its relation to pregnancy, its effects on the unborn fetus and the newborn baby, and to determine their practices toward prevention of the disease transmission.

3. Patients and Methods

This study is a cross sectional study conducted on pregnant women attending Babylon Maternity and Pediatrics Teaching Hospital during February 2019. Data was collected from study participants using a specially designed questionnaire form that includes demographic information, past history, as well as several questions regarding knowledge, attitude, and practice of those women regarding toxoplasmosis.

4. Statistical Analysis

Statistical Package for Social Sciences (SPSS®) Software version 23.0 for Linux® was used to perform statistical analysis for this study. Qualitative data are presented as numbers and percentages, while continuous numerical data are presented as mean ± standard deviation. Comparisons between study variables were performed using Chi-square test for categorical data and Student's t-test for numerical data. P-value of < 0.05 was considered statistically significant.

5. Ethical Considerations

Verbal Informed consent was obtained from all the pregnant women who agreed to participate in the study after explaining for them the objectives of this study. Patients information were treated with confidentiality and privacy throughout data collection and analysis.

6. Results

This study included a total of (98) pregnant women who attended the hospital for regular follow up. Age of participants ranged from (17) years to (40) years with a mean age of (25.0 ± 4.9) years and a median of (25) years. Age group distribution of the study participants are illustrated in Figure (1).

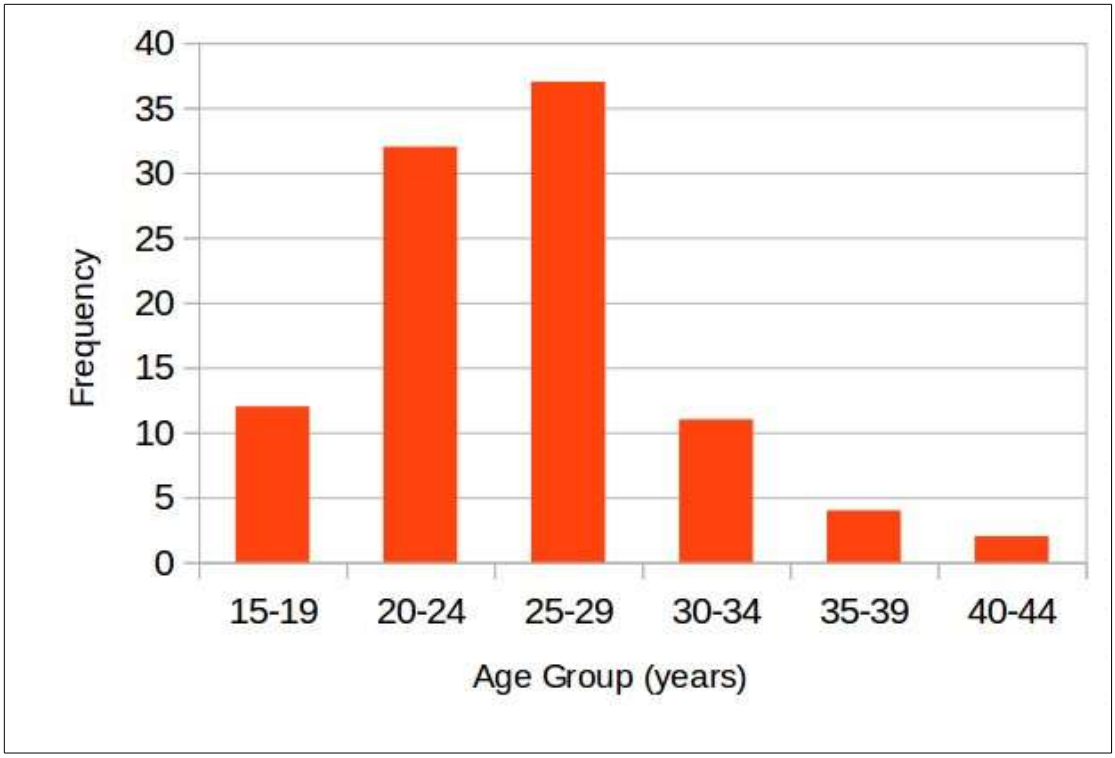

Figure (1): Age group distribution of the study participants

Demographic data about the females participating in this study, including educational level, residence, and previous pregnancy are presented in detailed percentages in Table (1).

Table (1): Demographic data of study participant

Demographic Data		Frequency	Percentage
Residence	Urban	34	34.69%
	Rural	64	65.31%
Education	Illiterate	16	16.33%
	Primary	56	57.14%
	High School	10	10.20%
	University Degree	16	16.33%
First Pregnancy	Yes	72	73.47%
	No	26	26.53%

Fifty nine women (60.20%) reported that they knew about the disease, and 54 (55.10%) reported performing a test for the detection of the disease. Females who reported previous occurrence of toxoplasmosis formed 46.94%. Table (2) compares incidence of previous toxoplasmosis between rural and urban residence. No significant relationship was observed between occurrence of toxoplasmosis and residence, Chi-square = 2.95, P-value = 0.086 as shown in Table 2.

Table (2): Occurrence of disease compared to residence

Residence	Previous disease occurrence		Total	P-value
	Yes	No		
Urban	20 (58.82%)	14 (41.18%)	34 (100%)	0.086
Rural	26 (40.63%)	38 (59.38%)	64 (100%)	
Total	52 (53.06%)	46 (49.94%)	98 (100%)	
Chi-square = 2.95, d.f. = 1, P-value = 0.086				

Regarding knowledge about the cause of disease, only 33.67% responded correctly that the disease is caused by infection, while 4.08% erroneously believed the disease is caused by poisoning. Regarding risk factors, 64.29% knew that cat feces can transmit the disease, and 51.02% knew that undercooked meat may transmit the disease. About gardening without gloves, 58.16% had correctly reported that it may transmit infection with toxoplasmosis.

About complications, 62.24% said that it can cause severe maternal complications, and 65.31% said it may cause severe complications for the fetus or newborn. However, only 26.53% knew that the disease may be present as flu-like illness, and only 9.18% were confident it can cause enlargement of the lymph nodes. About 49% had the knowledge that the disease may be asymptomatic for mothers, and 46.94% said it can be asymptomatic in the baby as well. Sixty-four percent correctly reported that toxoplasmosis may only be transmitted from the pregnant mother to her fetus if she is infected during that particular pregnancy. Only 24.49% knew that toxoplasmosis can cause vision complications for the newborn, but 59.18% believed that the disease in the baby can be treated by medical approaches.

Knowledge score was calculated for all study participants, giving 2 points for each correct answers, 1 point for answers of “Don’t know”, and 0 points for wrong answers. Figure (2) illustrates the knowledge scores for all study participants.

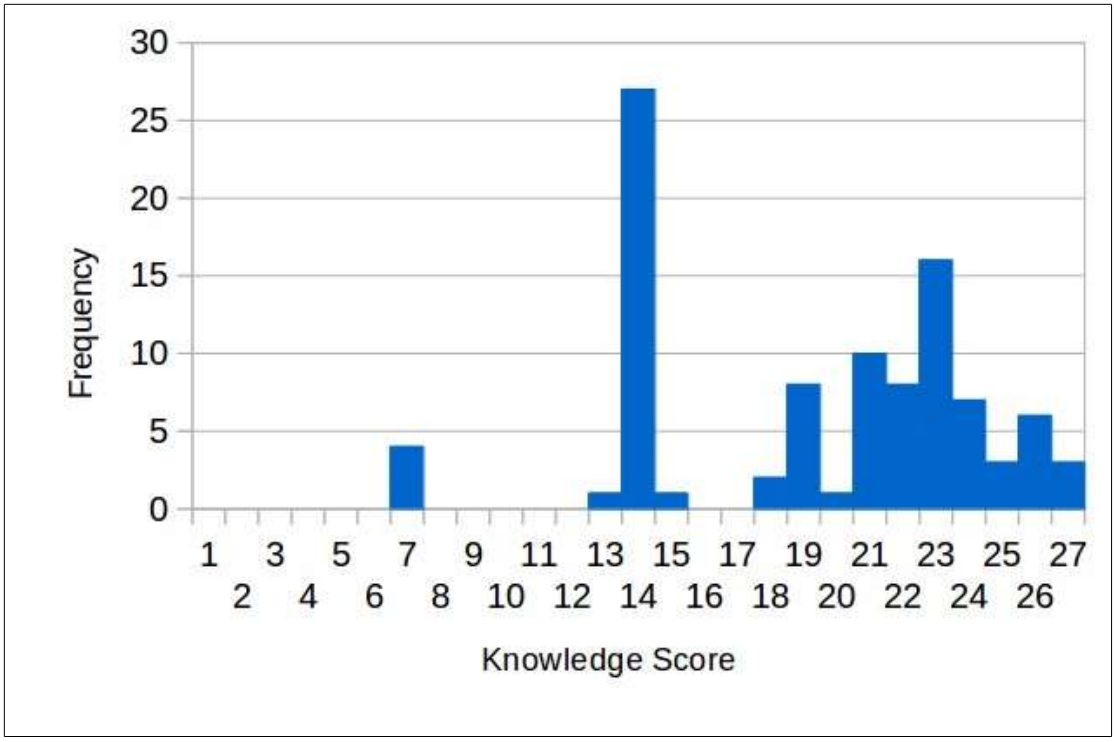

Figure (2): Histogram representing distribution of knowledge scores

The overall knowledge score was compared once with residence (whether urban or rural) and another time with the educational level of the participants. Urban residents had significantly higher knowledge score than rural residents, t-test = 2.61, P-value = 0.011, Table (3).

Table (3): Knowledge score compared with residence

Residence	Knowledge score		P-value
	Mean	SD	
Urban	20.97	3.80	0.011
Rural	18.50	5.40	
Total	19.34	5.03	
Student's t-test = 2.61, P-value = 0.01			

On a similar manner, comparison among the various educational levels regarding knowledge score was performed using ANOVA
statistical test. There was significant difference in mean knowledge score among various educational levels, ANOVA F value = 6.87, P-value < 0.001.

Regarding attitude, all women reported that they did not consume raw or undercooked meats, and 98.98% of them reported that they wash their hands thoroughly

after handling raw meat. Also, 97.96% of women reported that they wash their hands after working in farms or gardens.

About the toxoplasmosis vaccine, majority of women (86.73%) did not have information about the vaccine, and the vast majority (94.90%) were either not sure about their vaccination status for this particular vaccine or did not receive this vaccine. About 4.2% of them said the vaccine was not available for them, and 6.25% said they were afraid to receive the vaccine.

7. Discussion

The majority of study participants were aged below 30 years, this age group is important regarding knowledge and attitude, since most women get pregnant before age 30 years. Knowledge seemed to be highest regarding risk factors and mode of transmission of the disease. This is similar to the finding by Jones et al. in their study conducted in USA on 2003 which included a total of 403 pregnant women[12].

An important finding in the present study is the relationship between knowledge about toxoplasmosis and the area of residence; people living in urban areas had generally higher knowledge about toxoplasmosis than people living in rural areas. This fact, in addition to the fact that residents of rural areas are more exposed to farming work and gardening, indicates that further attention should be directed towards providing health education to those people living in rural areas, in order to allow them to better avoid contracting the disease.

Another finding is the relationship between knowledge and the level of education. This is generally expected, since people with lower level of education are less likely to acquire enough information about the disease transmission and prevention, which further increase the responsibility of health care providers to focus on providing extra information in simplified ways to those people with lower educational levels in order to help them avoid serious diseases.

Regarding attitude, the results was more promising, with the majority of participants said they follow the appropriate preventive measures that can help them avoid the transmission of the infection. The proportion of women who adhered to good health practices related to the prevention of toxoplasmosis was higher than the proportion observed by Jones et al. in their study in USA[12].

An important point to mention is that the majority of study participants lacked knowledge about the vaccine of toxoplasmosis, and were not sure about their vaccination status. This would require primary health care providers to spend more time clarifying for their patients the type of vaccine they are receiving and its importance in the prevention of serious diseases.

8. Conclusions

This study concludes that Iraqi pregnant females have medium general knowledge about toxoplasmosis, and that they have poor knowledge about the toxoplasmosis vaccine. However, their practices are generally good in favor of preventing disease transmission.

This study also concludes that residence (whether urban or rural) and educational level have significant impact on the level of knowledge about toxoplasmosis.

9. Recommendations

i It is recommended that health care providers and public healthinstitutes provide educational materials about toxoplasmosis disease, its effects on the pregnant mother and the fetus, its future complications on the baby, and its prevention measures.

ii It is important to provide complete and accurate educational materialsto all pregnant women, especially those who are having their first pregnancy.

iii It is also recommended to utilize general media channels to raiseawareness among the public about the importance of the disease and the capability of its prevention using the vaccine and by following the preventive measures.

Conflict of Interests.

There are non-conflicts of interest .

10. References

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الخلاصة

يعد داء المقوسات من الأمراض المعدية التي يسببها الطفيلي المسمى المقوسة الغوندية وينتقل للبشر عبر استهلاك اللحوم غير المطبوخة او الاطعمة الملوثة ببراز القطط المصابة بالمرض. إن الإصابة بالمرض أثناء الحمل قد تنتقل للجنين مسببة مضاعفات خطيرة وقد تؤدي للوفاة. هذه الدراسة هي دراسة قطعية اجريت على(98) أمرأة حامل ممن يراجعن مستشفى بابل التعليمي للولدة والاطفال خلال شهر شباط 2019، حيث تراوحت اعمارهم بين(17−40) سنة مع معدل العمر (25 ±4.9)، وتهدف الدراسة إلى تقييم معرفتهن حول المرض، دوره في الحمل، تأثيراته على الجنين، وسلوكياتهن نحو الوقاية من المرض. تم إيجاد إختلاف معتمد إحصائية في مستوى المعرفة بين سكنة المدن وبين سكنة المناطق الريفية. كذلك تم إيجاد تأثير معتمد إحصائية للمستوى التعليمي على مستوى المعرفة بالمرض. في المجمل، تم إيجاد ان النساء العراقيات الحوامل لديهن أمعرفة متوسطة عن المرض ولكن معرفتهن عن اللقاح الخاص به كانت ضعيفة. رغم ذلك، كانت سلوكياتهن تجاه الوقاية من إنتقال المرض جيدة.

الكلمات الدالة: داء المقوسات؛ الحمل؛ الوعي