

prevalence of Toxoplasmosis in pregnant women in Al Muthana province / Iraq

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Abstract:

The aim of our research is to study the prevalence of Toxoplasmosis in human in Al-Muthanna province during October, November, December 2009 and January 2010.

The sample size of the population studied was 81, our study revealed that total infection was 44.5% and there was significant effect of age on proportion rate which increase directly with age, highest infection rates was in 35-39 age group, while lowest at 15-19 age groups.

The infection in Unemployed women was 75% and higher than employed which was 25%. Ratio of the abortion was high and reached to 69.4% from total infected women . 54.3% of total abortions were due to Toxoplasmal infections.

مدى انتشار داء القطط في النساء الحوامل في محافظة المثنى / العراق

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الخلاصة:

تناولت الدراسة انتشار داء القطط (الذي تسببه احد انواع الابدائيات التي تعرف بمقوس غوندي *Toxoplasma gondii*) في الانسان في محافظة المثنى خلال اشهر تشرين الاول والثاني وكانون الاول لسنة 2009 وكانون الثاني 2010 وذلك بفحص 81 عينة دم مأخوذة من امصال نساء حوامل باستخدام طريقة Latex agglutination وقد وجد ان نسبة الاصابة الكلية كانت 44.5% . لوحظ من خلال الدراسة ان هناك تأثيرا معنويا ($P < 0.05$) للعمر على نسبة الاصابة التي تزداد بزيادة العمر اذ كانت اعلى نسبة اصابة بعمر 30 - 35 سنة واوطنها في المجموعة العمرية 15- 19 سنة. تبين ان الاصابة في النساء التي تمتلك وظيفة معينة كأن تكون مدرسة او مهندسة الخ اقل منها في ربات البيوت اذ كانت نسب الاصابة 25% و75% على التوالي. ظهر ان الاجهاض كان عاليا في حالات الاصابة بالطفيلي اذ بلغ 69.4% اما نسبة الاجهاض المتسبب بوساطة الطفيلي مقارنة للنسبة الكلية للنساء المجهضات فقد بلغ 54.3%.

Introduction:

Toxoplasmosis is a cosmopolitan disease arising from infection with the cat-borne Apicomplexan, coccidian protozoan *Toxoplasma gondii*, an obligate intracellular parasite that forms cysts in

mammalian tissues throughout the body (1).

Toxoplasmosis is a major public health problem, with a high socioeconomic impact in terms of human suffering including the cost

of caring for sick, mentally retarded and blind children (2).

The parasite is an extremely successful pathogen, responsible for significant morbidity and mortality, especially in congenitally infected and immuno-compromised individuals (3,4,5), although some subjects experience infection without overt disease or with mild symptoms (6,7).

T. gondii has a worldwide distribution in human populations infecting up to one third of the global population and a wide range of other mammalian and avian species (8,9). On farms, *T. gondii* is a major cause of abortion and problems with fertility in livestock, especially among ewes (10), and therefore a significant cause of lost profitability in livestock agriculture (11).

The most important channels for transmission to humans are by ingestion of food or water contaminated with oocysts shed by cats, by eating undercooked or raw meat containing infective tissue cysts and via transplacental transfer, notably when the mother becomes infected for the first time during pregnancy (1,5,7,12,13,14,15).

Human infection with *T. gondii* is a huge challenge for which there is no effective treatment. Toxoplasmosis is a zoonosis arising from man's close contact with domestic cats (*Felis catus*) (16,17). Both domestic and wild felids are the only known definitive hosts of *T. gondii* in which the sexual cycle can take place (18) and hence cats play a central role in the epidemiology of *T. gondii*,

constituting the only known source of environmental contamination with the infective oocyst stage (9). A high risk is thus imposed on human communities that come into contact with cats (12). As in many cities throughout the world, Al-Muthana province in Iraq has had a significant rodent problem for decades.

Materials and Methods:

Study location, selection of subjects and inclusion criteria was Al-Muthana is city in western south of Iraq, with patches of agricultural land that are mostly grass fields.

The subjects for this study were 81 women who had been diagnosed with recent spontaneous abortion. We Took a previous history of mothers of any these conditions.

Sample collection:

Blood samples were obtained from subjects referred for examination in out-patients clinics by medically trained staff, record number, and information on age and sex. The subjects were referred to the phlebotomy unit for whole blood collection (5 ml) by venipuncture in plain tubes. The blood samples were then transported to the parasitology laboratory at department of biology of college of science of Al-Muthana university. Blood samples were centrifuged to remove blood cells and stored at +4°C for 48 hours or frozen at -20°C for longer storage.

Serological testing for toxoplasmosis:

T. gondii infections in humans can only be detected by antibody levels and the current analysis is based on the prevalence of *T. gondii* specific

IgM (evidence of current infection, appearing within 1–2 weeks of infection and subsiding by 6–9 months (8) . Latex test was used for the serodiagnosis of toxoplasmosis (Toxocell, Biokit SA, Barcelona, Spain). This is a one-step rapid latex particle agglutination test on a slide for the qualitative and semi quantitative determination of toxoplasmosis antibodies in serum according to (19). The data of research were analysed by Chi square according to (20).

Results:

Our results revealed that total infection of Toxoplasmosis in women in Al-Muthanna province during October, November, December 2009 and January 2010 was 44.5% and there was significant effect of age on proportion rate which increase directly with age, highest infection rates was in 35-39 age group, while lowest at 15-19 age groups . (Table 1).

Table 1: Effect of age on toxoplasmal infections

Age groups	No. of examined samples	No. of Infected samples (percentage)
15-19	9	-
20-24	24	9(37.5*)
25-29	33	18(54.5*)
30-34	27	17(62.9*)
35-39	13	9(69.2*)
Total	81	36(44.5)

* Significance differences ($P < 0.05$).

Table 2 showed the infection in unemployed women was higher (75%) than appear in employed one (25%).

Table 2: Number and proportion of toxoplasmal infections in employed and unemployed women.

Total infected women	Employed infected women		Unemployed infected women	
	No.	%	No.	%
36	9	25	27	75

Ratio of the toxoplasmal abortion was high and reached to 54.3% of total abortions (Table 3).

Table 3: proportion of toxoplasmal abortions from Total examined abortions

Total examined abortions	Toxoplasmal abortions	
No.	No.	%
46	25	54.3

We found most infected samples with titres 1:2 but lowest samples at 1:64 (Table 4).

Table 4: Titres of toxoplasmal infections

Titres	1:2	1:4	1:8	1:16	1:32	1:64
No. of infected samples	12	11	-	10	-	3

Discussion:

The results of the present study demonstrate how seroepidemiological community-based surveys are useful in assessing the level of exposure to toxoplasmosis. The rates of infection with toxoplasmosis reported in this study was 44.5% approaching that reported in Basrah governorate (19) southern Iraq but lower than Other study in USA had variable results but most were concerned with the prevalence in the total population, where it was found to be 60.4% (21) and higher than those reported in neighbouring countries such as Saudi Arabia (22,23). In Saudi Arabia prevalences of 32.7% and 25.0% were reported.

The samples were collected from Al-Muthanna laboratories which are surrounding rural areas where they have habits infavor of acquiring toxoplasmosis by eating unwashed raw vegetables or unpadding fruits. In

addition, in the semi rural cities there is close contact with cats and consequent exposure to sporulated oocysts by ingestion of these oocysts that contaminate soil during farming, or eating undercooked meat contaminated with cysts. Moreover, the low level of education in the women about the risk factors for toxoplasmosis may play an important role in the high rate of infection (23).

The significant increase in the level of toxoplasmosis infection with increasing age reported in this study was also confirmed in the above studies. This rising trend with age, reflects the continuing risk of infection throughout adult life and arises from the cumulative risk of exposure and infection with age in an environment where transmission is encouraged by the high density of feral cats (24).

Infection rate in employed women were lower than unemployed which are more contacting with infection sources than employed and consider lady of kitchen and perform many functions that may become sources of infection like cleaning of vegetables and fruits which may exposure to contamination with *T.gondii* oocysts by cat faeces, also raw flesh cutting for cocking by hand may cause infection when bradyzoites (cysts contain bradyzoites of *T.gondii* found in meat) are destroyed and transferred to hand wounds. Ultimately working in gardens may count another source of unemployed women infections when contaminated with cat faeces also employed women more health awareness than unemployed (25,26).

In the current study, the frequency of toxoplasmosis among women with single or repeated abortions was found to be 54.3% by using Latex agglutination. In Iraq, a similar result was obtained by (27) demonstrated that 43.7% of women with abortion have positive IgM by ELISA test. Al-Sorchee (2005) who demonstrated that 30.7% of women with abortion have positive IgM by using ELISA technique (28). Abbas (2002) showed that 21.5% of women with first abortion have positive IgM by ELISA test (29).

This relatively high percent in our study may be due to many factors including the sample size which was only 81 and the patients were selected from Al-Muthanna laboratories / Iraq who had abortion and with suspension of toxoplasmosis during pregnancy (by

history and physical examination). Therefore, this type of sample selection might reflect this high percent. In the present study, the relatively high frequency of toxoplasmosis in women with abortion could be due to the sample selection also all above studies used ELISA test which is consider more specific technique than latex agglutination which was used in our study (30).

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Figure 1: Questionnaire Sheet

Questionnaire Sheet		
Case number:	Date:	
Patient Name:	Age:	
Address:	Urban	Rural
Date of LMP:	Gestational age	
Number of previous pregnancies		
Number of previous abortions		
Parity		
Summary of obstetrical history (Abortions in details)		
G1	G2	G3
Repeated abortion consecutive or not		
Previously diagnosed for toxoplasmosis		
Previous treated for toxoplasmosis		
Are there congenital abnormalities in fetus?		
Contact with animals		
Educational level		
Preexisting medical diseases		
Uterine abnormalities		
Family history of genetic diseases		