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Prevalence of immunity to toxoplasmosis among pregnant women in UniversityHospital Center Hassan II of FEZ city (Morocco)

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ABSTRACT

Introduction: Toxoplasma infection is considered as the most frequent infection in both animals and humans. It is due to protozoan parasite belonging to phylum of Apicomplexa, Toxoplasma Gondiiwhich can have severe congenital consequences if acquired in pregnancy. **Material and methods:** In this prospective study, toxoplasmosis seroprevalence was searched in asymptomatic pregnant women attending the central laboratory of university hospital center Hassan II of Fes city between 2010 and 2015. Samples are treated by chemiluminescent microparticle immunoassay. **Results:** In our study the rate of IgG anti-toxoplasma was 39.7% which is close to other Moroccan cities and different from Europe. **Conclusion:** The variances in prevalence between different region is related to different factors such as habit of eating, contact with cat and mediocre sanitation and hand hygiene.

Keywords: Toxoplasmosis, Immunity, Pregnant women.

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INTRODUCTION

Toxoplasma infection is considered as the most frequent infection in both animals and humans. It is due to protozoan parasite belonging to phylum of *Apicomplexa*, *Toxoplasma Gondii*(*T. gondii*), which generally transmitted to human by consuming food or water contaminated containing oocysts coming from infected cat fecal matter or by eating raw meat containing tissue cysts. Although, blood or leukocyte infusion, organ transplantation or transmission through the placenta are other probabilities of infection.[1,2] In the course of the primary infection attracted in pregnancy, the parasite transmitted to fetus via placenta, leads to congenital infection as well as different sequels. Development of fetal infection and severity of sequels that will develop are correlated with the gestational week.[3,4]

The incidence concerning congenital infection increased during pregnancy so it is 10-25% during the first trimester, 30-54% during the second trimester and 60-65% during the last trimester[5] when the transplacental transmission seems to be considerably less frequent in the beginning of pregnancy, the sequels developing are more severe. The transmission rate is elevated in latent period while the severity of the infection developing in fetus is mild. Moderate symptoms could develop in fetus or they are asymptomatic in delivery.[6-8] The clinical representation is particularly varied in congenital toxoplasmosis. Even while in some cases no symptoms and findings are observed, spontaneous abortions or stillbirth can happen. The generally common findings are chorioretinitis, intracranial calcifications or hydrocephalus. For the newborn as asymptomatic, hearing and visual problems, neurologic findings and mental retardation can develop after many years.[9]

This study was established to evaluate the prevalence of Toxoplasma Antibodies (IgG) in pregnant women during the first trimester of pregnancy, in Fez city.

MATERIALS AND METHODS

In this prospective study, toxoplasmosis seroprevalence was searched in asymptomatic pregnant women attending the central laboratory of university hospital center Hassan II of Fes city between 2010 and 2015. Blood samples had been collected in

a labeled 5ml plain tubes via venipuncture and able to clot at room temperature.

After centrifugation for 10 min, serum may be stored in eppendorf tubes at -20°C until testing, for extended periods samples needs to be frozen at -20°C. Antibodies related with toxoplasma were studied serologically through chemiluminescent microparticle immunoassay. The procedure was as follow: a pre-diluted sample, assay diluent and recombinant *Toxoplasma gondii* antigen 4coated paramagnetic microparticles are mixed. *Toxoplasma gondii* specific antibodies present in the sample join to the recombinant *Toxoplasma gondii* antigen coated microparticles. Following wash, 4murine acridinium-labeled anti-human IgG conjugate is introduced to create a reaction combination. Following one more 2 wash cycle, pre-trigger and trigger solutions are put in to the reaction mixture.

The resultant chemiluminescent reaction is determined as relative light units (RLUs). A direct correlation is existing between the quantity of anti-Toxo IgG in the sample and the RLUs which is analyzed by the ARCHITECTi System optics. Information regarding the patients was acquired by checking their outpatient clinic information retrospectively. Statistical analyses were done by choosing SPSS 10.0 for Windows, SPSS Inc. Computer program.

RESULTS

A total of 3440 pregnant women were recruited during the study period, the majority of women aged between 25-30 About 14.5% (499/3440) of the pregnant women were in the first trimester with 64.2% (2209/3440) and 21.3% (732/3440) in the second and third trimesters, respectively. The result show that 1367/3440 (39.7%) were positive for anti-T. gondii-specific IgG antibodies while 1973/3440 (57.3%) were sero-negative for anti-toxoplasma antibodies.

The highest prevalence of *T. Gondii* IgG antibodies 26.9% was seen in the age stratum 25- 30 years old, while the age 45-50 showed the lowest IgG seroprevalence 1.9% ($p<0.05$). The results shown in Table1.

DISCUSSION

In this study, the rate of IgG anti- toxoplasma was 39.7%. This result means that almost 57.3% of pregnant women are susceptible to acquire the infection once they are exposed in the course of pregnancy, and therefore may transmit the infection to the fetus. This rate of IgG antibodies sero-positive is close to the rate revealed in other Moroccan cities as Kenitra, Tétouan and Nador which are 36.7%, 42.6% and 43.3% respectively.[10] B. El Mansouri *et al* have reported rate of 50.6% in Rabat other city. Moreover it is close to the rate reported in Lybia 37.17,[11] Tunisia 45.6[12] and Algeria 47.8 % .[13] On the other hand, the finding of anti IgG is lower than that reported in France 84%.[11]

Table 1: Sero-incidence of *T. Gondii* IgG seropositive among age groups (years)

Age group	Sero-incidence of *T. Gondii* IgG seropositive	
Age	%	n
[15-20[	2.3%	32
[20-25[	14.7%	202
[25-30[	26.9%	369
[30-35[	24.8%	339
[35-40[	20.9%	286
[40-45[	8.1%	112
[45-50[	1.9%	27
Total		1367

The variances of infection could be as a result of the variation in the prevalence of human Toxoplasma infection in different regions, countries and populations throughout the world. These may include: habit of eating raw or undercooked meat, owning a pet cat in the house or residing in an area with lost cats living in close contact, insufficient hand washing after handling affected garden soil or kitty litter, frequent consumption of raw vegetables outside the home, unhealthy feeding habits, climatic conditions.[14,15]

The increased incidence of *T. gondii*s eroprevalence in humans in France seems to be correlated in some way to the French consumption some meat products raw or undercooked. While in Morocco, Laboudi *et al*.[16] revealed the fact that contact with the ground and illiteracy were regarded as the major risk factors of contracting toxoplasmosis. Other risk possible in morocco: mediocre sanitation and hand hygiene as well as eating contaminated raw food or water.

CONCLUSION

To avoid toxoplasma infection and the congenital consequences, it is necessary to check serological status prior conception in every woman of childbearing age. Therefore women sero-negative are highly predisposed to develop infection so they should follow recommendation of toxoplasmosis prevention where eating habits and hygiene practices have evidently been recognized as risk factors.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATION USED

Toxoplasma Gondii : *T. gondii ;* Relative Light Units :RLUs

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