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TOXOPLASMOSIS: SEROLOGIC PROFILE OF PREGNANT WOMEN AT THE BRAZZAVILLE UNIVERSITY CENTRE HOSPITAL (CHUB)

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Abstract

Introduction: Toxoplasmosis is a disease caused by an obligate intracellular coccidia Toxoplasma gondii, which is transmitted by cats. In pregnant women, it is a concern because of the severe complications to the foetus. The objective of this study is to determine the toxoplasma serologic profile in pregnant women at the Brazzaville University Centre Hospital (CHUB).
Materials and Methods: This is a cross-sectional study from September 2015 to March 2016 (6 months) which includes sera from pregnant women received at the Parasitology Mycology laboratory of the CHUB for Toxoplasma serology. Immunoglobulins G and M searches were done by immuno-analysis (Biomerieux, Mini-Vidas technology). The data was analysed by the IBM SPSS version 20 software. The comparisons of proportion is done by the khi 2 test. The level of significance of statistical data were fixed at 5%.
Results: The mean age of pregnant women included in our study was 27, 8+/- 6,84 with the extremes ages of 15 and 44 years.
Toxoplasma seroprevalence in this study is 47,2% (68/144). The types of immunoglobulins (Ig) retrieved were IgG alone in 45,1% of cases (65/144), IgG associated to IgM in 2,8% of cases (4/144). Serological profiles were: no immunity (52,1%) immunised (41%), recent infection (1,4%) active infection (2,8%) equivocal result (2,8%).
Conclusion: Toxoplasmosis is a zoonosis which represents a real public health issue in our environment, even when the level of immunised pregnant women seems high.

Keywords: Toxoplasmosis; Serologic Profile; Pregnant Women; Brazzaville; CHUB.

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1. Introduction

Toxoplasmosis is a worldwide parasitic infection caused by an obligate intracellular coccidia, *Toxoplasma gondii* [1, 2] with the cat as a primary host. Humans can be infected by ingestion of oocysts and cysts in contaminated products [2]. This infection can affect men and women but is a major concern in pregnant women, foetus, new born [3] and in HIV immune compromised hosts [1,4]. Its biological diagnosis is established by a variety of methods such as ELISA which detects Immunoglobulins (Ig) G and M [5].

A study realised in Congo showed a toxoplasmosis seroprevalence of 60% in pregnant women [6]. Thus, we realised this study with the objective to determine the serological profile to Toxoplasma in pregnant women.

2. Materials and Methods

This is a cross-sectional study realised from September 2015 to March 2016, 6-month period. Sera were collected from pregnant women coming at the parasitology- mycology laboratory of the CHUB for toxoplasma serology.

A sample of 5ml of blood is collected in a desiccated tube from the fasting patients. Sera were collected and analysed the same day or the next day after conservation at 4-8^{0}C. The information such as age, term of pregnancy, practitioner's grade, and toxoplasma serology status of patients were noted.

Sera were analysed by automated qualitative test Biomerieux Mini-Vidas for the search of Ig G and M. This assay has the advantage to limit the interferences with the determination of Ig M (natural Ig M, rheumatoid factor, anti- nuclear antibodies, competing Ig G/Ig M antibodies).

This allows us to measure Ig G and Ig M specific antibodies, after immunocapture by alkaline phosphatase labelled immune complex. The final detection of Ig is done by fluorescence ELFA (enzyme linked fluorescent assay). All the assay steps are performed automatically by the instrument.

The Ig M results are obtained by an index which translates the "difference" between the fluorescent signal of serum tested and the memorised standard signal. All value (*i*) <0,55 is a serum without Ig M antibodies; a value of (*i*) >0,65 is a positive serum with Ig M specific traits. The results of Ig G are given in IU/ml. When the value is <4 this means serum without Ig G antibodies. All value >8 is considered as a positive Ig G specific.

We did not collect a second sample even when the immunoglobulins values were equivocal.

The results were considered as positive when one class of the Ig G or Ig M corresponded to the presence of immunoglobulins using the different serological profiles of the immunoglobulins G and M which are the following:

- Non-immunised Ig G -; Ig M-
- Immunised Ig G +; Ig M – with Ig G level < 300 IU/ml

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- Recent Infection Ig G+; Ig M- with Ig G level ≥ 300 IU/ml
- Acute infection Ig G -; Ig M + or Ig G+; Ig M +.

The data was analysed by the IBM SPSS version 20 software. The comparisons of proportion is done by the khi 2 test. The level of significance of statistical data were fixed at 5%.

3. Results

A total of 144 pregnant sera were collected.
Socio-demographic characteristics of pregnant women
Mean age of pregnant women is 27,8 +/- 6,84 with extremes at 15 and 44 years.
Table I shows the distribution by age.

Table 1: Distribution of pregnant women by age

Age scale	Nomber	Percentage (%)
< 20 years	21	16,6
20-29 years	68	47,2
30-39 years	45	31,3
≥ 40 years	10	6,9
Total	144	100

The pregnancy terms at the time of sampling were between 3 months and 3 months and a half for the majority for 30,2%, 34% (49/144) were at the first trimester; 59% (85/144) at 2nd trimester and 6,9% (10/144) at the third trimester.

The requests were done by medical doctors in 47,9% (69/144) of the cases and 48,6% (70/144) by midwives.

Toxoplasma seroprevalence in pregnant women in our study is 47,2% (68/144). The type of immunoglobulin (Ig) found were Ig G alone in 45,1% of the cases (65/144), Ig G associated to Ig M in 2, 8% (4/144) of the cases.

The serological profile is given figure 1. The serological profile to toxoplasma gondii according to age distribution and pregnancy term are in figure 2 and 3.

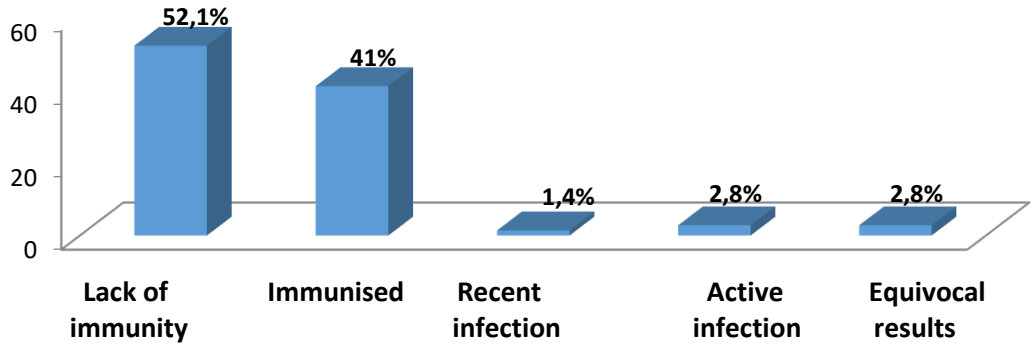

Figure 1: Serologic profile to *Toxoplasma gondii* in pregnant women

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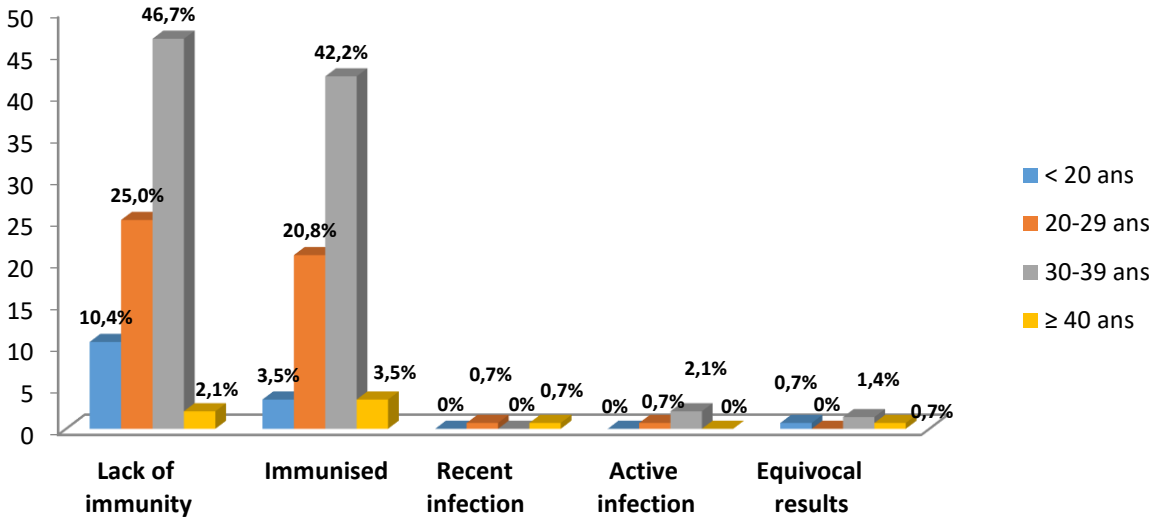

Figure 2: Serologic profile to *Toxoplasma gondii* according to age scale

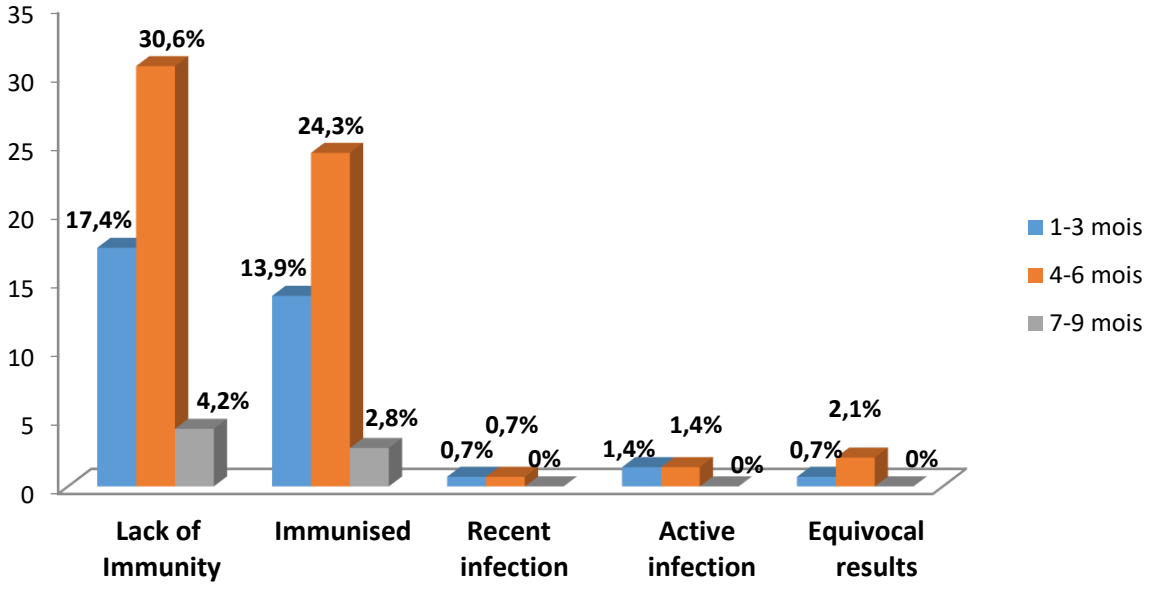

Figure 3: Serologic profile to *Toxoplasma gondii* according to pregnancy term

4. Discussion

The mean age of gestants in our study was 27,8 years. Yobi D [7] in Kinshasa in DR Congo and Ndiaye IM in Dakar, showed that the median age of 28 years and 26 years respectively, which corresponds to the median age of pregnant women in our study (27,8 years), this is related to the age when they women are sexually active.

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Toxoplasma serology realised during the 2nd trimester, in more than half the cases, the pregnant women can be explained by the delay between the realisation of pregnancy and the time of first antenatal screening, and also by low socio- economic level of pregnant women who have to pay the cost of all screening tests sources. This can be improved by the application of the national medical aid program in our country.

Our results are identical to those Ogouyemi-Hounto A[9] in Cotonou. Antoniou M [10] in the Crete region observed that 54,44% of serology when done during the first trimester. In Yobi's [7] study in Kinshasa 51% of pregnant women who have done their first serology during the their 3rd trimester versus 46,8% in the 2nd trimester.

The seroprevalence of toxoplasmosis is low n our study compared that found by Makuwa M in Brazzaville [6]. It varies according to the different authors of the subregion [7, 8, 9, 11, 12, 13]. Epidemiological, environnemental and methodological differences partly justify the disparities.

The lack of immunity in our cluster is different to these of Makuwa M [6] in the population of pregnant women in Brazzaville. Our results can be the sign of decrease of toxoplasmosis cases following the improved lifestyle in Brazzaville and an improvement in the carrying of pregnancy, they are monitored by qualified personnel who have the knowledge to advise pregnant women who are seronegative. This lifestyle improvement associated with Congolese custom, to have domesticated cats is not part of our practices can explain these results. Unfortunately, this lack of immunity put pregnant women at first risk to be acquiring an active toxoplasmosis with foetal transmission. In Dakar [8] and Franceville [12] the authors found similar results to ours.

Makuwa's study [6] found an immunisation more present at the average age of 20 years; meanwhile in our case, the immunisation was found in women aged between 30-39 years. This can be the result of delayed contact with the toxoplasma. Messerer L [14] in Wilaya d'annaba in Algeria found an immunisation mostly age of 10-20 years. The presence of active infection and recent infection to toxoplasma was low in our study. These infections were observed in pregnant women aged 20 -39 years with a non-significant difference. This occurred during the period where the risk of foetal transmissions was high with variable consequences. Makuwa M [6] had a prevalence of active infection twice as high as ours. This difference can be the result of better knowledge of the pathology of medical personnel who are in change of pregnant women this allowing a decreasing risk to pregnant women to seroconvert in non-immunised pregnant women. Ndiaye IM [8] in Dakar showed a prevalence of active injection, while Lo G [9] in the same city found a low prevalence of active injection.

Our results are higher to those of El Mansouri [11]and Messerer [14]in rabat where it shows a prevalence of active injection of 1,8% and 1,1% respectively. On the contrary, Awoke K [15] in his work in Felege Hiwot in north east Ethiopia found no active infection.

Adou-Bryn KD [16] in Abidjan and Nabias R [12] in Franceville had found a prevalence of acute infection similar to that we found.

The severity of toxoplasmosis infection in pregnant women in a case of "contamination" depends on the pregnancy term. The contamination can be high risk when this occurs during the 1st

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trimester, while the severity is low when the contamination is during the 2nd and 3rd trimester [1]. Otherwise, the ideal idea is to initiate better care during pregnancy and to have healthy child by avoiding as much as possible any infections.

5. Conclusion

The seroprevalence of toxoplasmsis is high in our study. The immunization rate of pregnant women is high. However, the presence of infection with Ig G and IG M fears the occurrence of congenital toxoplasmosis. This shows the importance of early detection of toxoplasmosis and prevention in pregnant women to reduce the risk of fetal harm.

Conflict of Interest

None.

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