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RESEARCH ARTICLE

Toxoplasma gondii infestation among pregnant women In Mahajanga, Madagascar

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ABSTRACT

Toxoplasmosis is a public health concern mostly among pregnant women in developping countries. The study aims to determine the seroprevalence of the infection on pregnant women, to identify whether it is a recent or an old infection and to assess risk factors.

A prospective and detailed survey was then conducted from July to October 2016 at the the integrated health centre of Mahabibo and the basic health centre of Tanambao Sotema in Mahajanga which is a west north city of Madagascar. The blood specimens were collected and then sent to the University Hospital Center Zafisaona Gabriel laboratory.

In whole, 49 subjects were investigated with a mean age of 25 years old. The seroprevalence of the old infection (IgG+ and IgM-) was of 61% (n=30), non-immunized pregnant women (IgG- and IgM-) represented a rate of 39% (n=19). None of them was diagnosed with an acute infection (IgG+ and IgM+). No significant relation was associated between the infestation of Toxoplasma gondii and household cats, neither with housekeeping occupation nor with education level, whether being aware or not of the infection ($p>0.05$).

Toxoplasmosis is poorly known at Malagasy people. The seroprevalence in non-immunized pregnant women and those at risk is revealed to be high.

KEY WORDS: Toxoplasmosis, pregnant women, IgG, IgM.

History

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INTRODUCTION

Toxoplasmosis is a zoonosis caused by Toxoplasma gondii which is often neglected because of its mild infection. Toxoplasma gondii is one of the most common protozoal parasite that infects up to 30% of humans globally [1]. The prevalence rate and behaviors in view of this disease differ from one country to another. This infection is often asymptomatic in persons with a normal immune system. However, in pregnant women and immunosuppressed individuals, clinical cases could be severe. In the United States, T. gondii occurs in 400–4,000 infant births annually and can lead to neurological sequelae or ocular diseases [2]. The mother-to-child transmission upon primary infection increases with gestational age, ranging from 6% at 13 weeks of gestation to 72% at 36 weeks of gestation [3].

In Madagascar, the serological detection of toxoplasmosis is systematically performed in large facility hospital centres from the first prenatal consultation. Which is not the case of basic health centres where the unawareness of its severity and the cost of screening are the hindrance factors of achieving test at prenatal consultation.

The seroprevalence of toxoplasmosis on pregnant women is not documented in Mahajanga. We have performed a survey which objectives were to determine the seroprevalence of toxoplasmosis, to identify whether the infection is recent or old and to analyse risk factors.

MATERIAL AND METHODS

A prospective and descriptional study of Toxoplasma gondii infestation on pregnant women who attended prenatal consultion (PNC), was carried out from July to October 2016 at the integrated health centre (CSI) of Mahabibo and the basic health centre (CSB) of Tanambao Sotema in the urban municipality of Mahajanga. Blood samples were taken and conveyed to the laboratory of the University Hospital Center Zafisaona Gabriel for screening.

Women who did not have their PNC either at the CSI of Mahabibo or CSB of Tanambao Sotema were excluded from the study, together with those who did not give their consent. The confidentiality of the investigation was preserved. For each patient, a Five milliliters of blood were collected in dry Vacutainer tube by venipuncture of the forearm. Sera was collected after centrifuging blood wt 2500g during 10 minutes.

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An Enzyme Linked Immunosorbent Assay (ELISA) was performed using a qualitative screening of Toxoplasma gondii IgM and IgG antibodies (Kit Mediff France).

RESULTS

A total of 49 pregnant women were included with an average age of 25 years (Table I, Table II, Table III, Figure 1).

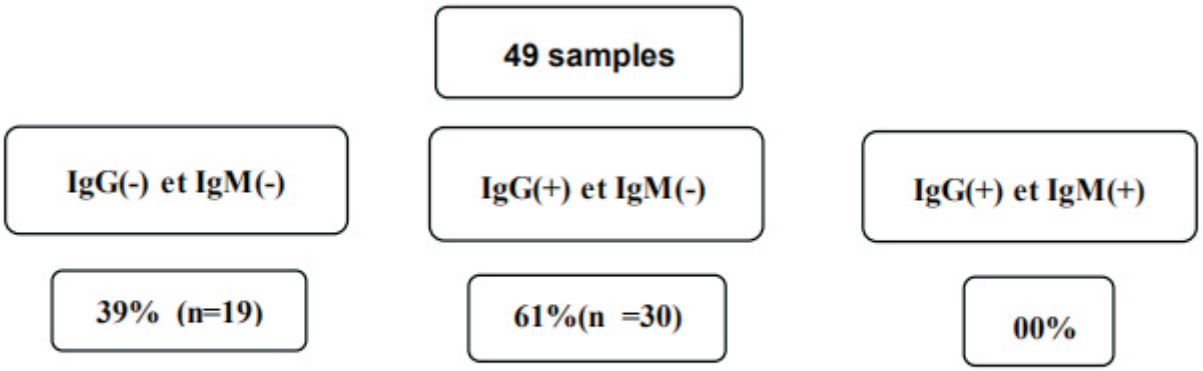

Figure 1 : Seroprevalence of Toxoplasma gondii infestation.

Table 1 : Age of pregnant women.

Age group	Total N (%)	IgG (+) n(%)	IgG (-) n(%)
	49 (100%)	**30(61%)**	**19(39%)**
< 15	01(2%)	01 (3%)	00
[15 -19]	19(39%)	12(40%)	07(37%)
[20 -24]	9(18%)	5(17%)	04(21%)
[25 -29]	14(29%)	8(27%)	06 (32%)
[30 -34]	04 (8%)	03(10%)	01(5%)
=35	02 (4%)	01(3%)	01(5%)

Table 2 : Gestational age.

Week of amenorrheas	Total N (%)	IgG (+) n(%)	IgG (-) n(%)
	49 (100%)	**30(61%)**	**19(39%)**
[10 -20]	15(31%)	11(37%)	04(21%)
[21 -30]	32(65%)	19(63%)	13(68%)
>30	2 (4%)	00	02(11%)

Table 3 : Study of factors associated with Toxoplasmosis.

Variables	Total N (%)	IgG (+) n(%)	IgG (-) n(%)	p value
	49 (100%)	**30 (61%)**	**19 (39%)**	
Presence of domestic cat				0.11
Yes	15 (31%)	12(40%)	03(15%)	
No	34 (69 %)	18(60%)	16 (85%)	
Housekeeping occupation				0.76
Yes	28(57%)	18(60%)	10 (53%)	
No	21(43%)	12(40%)	09 (47%)	
Iliterate level of education				0.51
Yes	02 (04%)	02(07%)	00	
No	47 (96%)	28 (93%)	19(100%)	
Knowledge in Toxoplasmosis				1.00
Yes	01(02%)	01(03%)	00	
No	48(98%)	29(97%)	19(100%)	
Abortion of story	49(100%)	30(61%)	19(39%)	1.0
None	36(74%)	22(73%)	14(74%)	
Once	09(18%)	05(17%)	04(21%)	
More than once	04(08%)	03(10%)	01(05%)	
Number of pregnancies	42 (100%)	23(55%)	19(45%)	0.79
1	20(48%)	12(52%)	08(42%)	
>1	22(52%)	11(48%)	11(58%)	

DISCUSSION

The seroprevalance rate of toxoplasma is very high, with 61% (Figure 1). It varies from country to countries but remains very significant over the world, as 68.6% in Brazil [4], 70% in Cameroun [5], and 82.3% in Ethiopia [6]. Some literatures reported that contact with cats and soil [6], consumption of uncooked vegetables and failure to acquire safe source of water [5] were among risk factors for T.gondii infestation. As for others, contact with household cats was not linked to the chance of getting the infection as mentioned in this study (Table III) the same was also reported in Japan [7] or in Tanzania [8] and in Nigeria [9]. A risk of infection might exist when there is close contact with cats or with their feces that remain in the environment for at least 24h so that the oocysts sporulate and become infective [10]. No significance was related between the risk of infection with Toxoplasma and the level of education, « housekeeping» occupation or the awareness of its transmission (Table II). Moreover, women with lower level of education were considered as predictor of Toxoplasma infection [11]. Transmission occured mostly through fecal-oral route, so women might get infected regardless of her occupation, or awareness of modes of transmission, but it would be much better if it occured before pregnancy.

Infection before pregnancy benefits to the fetus since the mother is being immunized. Conversely, the IgM detected during pregnancy is a potential risk of congenital T. gondii infection. All along this study, no pregnant women had any recent infection (positive IgM). Which case was as well reported in Turkey [12]. Nevertheless, those IgM might be slightly positive with a low prevalence as it was reported in Ethiopia with 3% [6], 1.1% in Algeria [13] and 0.25% in Japan [7].

The risk of mother-to-child transmission is around 29% but it could vary depending on age of pregnancy (6 % during the first trimester to about 80 % at the end term of pregnancy) while the severity of the disease evolves in an opposite direction [14]. Most of pregnant women with 20 to 30 weeks of amenorrhea, were carrier of IgG antibodies (Table II). Neither any relation was found between toxoplasmosis and age of pregnancy at consultation, nor with the number of pregnancies, or with abortion. Similar remarks were as well noticed in Benin and in Iran [15,11].

In case of negative IgM, representing 30% of the current study, a monthly follow-up of the serology is recommended to check for any conversion in order to prepare for occurrence of toxoplasmosis as soon as it appears.

CONCLUSION

When referring to conclusion drawn from analysis, serum screening is a key step of preventing congenital toxoplasmosis, as it could dictate future behaviors, and move for both prenatal and postnatal measures taking. Toxoplasmosis is less known. A large number of malagasy women under pregnancy showed anti-toxoplasma IgG in their serum. This study has also pointed out the high prevalence rate among non-immunized pregnant women who were exposed to risk of congenital complications.

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