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Full Length Research Paper

Interest of spiramycin in the treatment of toxoplasmosis in Dakar

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Toxoplasmosis is an anthropozoonosis of medical and veterinary importance, due to the protozoan *Toxoplasma gondii*. Oocysts shed by felids play a key role in parasite transmission as they contaminate meat-producing animals, vegetables and water consumed later by humans. This study tried to study the effectiveness of spiramycin in the treatment of toxoplasmosis in the laboratory of the Abass NDAO Hospital's (CHAN) in human immunodeficiency virus (HIV)-positive women (82 cases) using the enzyme immunoassay method solid phase (EIA). It reveals a negativity of IgM antibodies and progressive regression of IgG antibodies more visible in three women as high (between 50 and 100 International Units (IU)/ml) and in three other unreliable in the first immunoglobin M (IgM) serology by a seroconversion at the second serology with a stabilization of immunoglobin (IgG) 10 IU/ml. The effectiveness of current treatment has been demonstrated by low return rate IgG antibodies to 10 IU/ml in those who received 3 million IU of Rovamycin at a dose of 2 tablets for day to one month. These first results need to be followed by more extensive investigations.

Keywords: Prevalence, treatment, toxoplasmosis, *Toxoplasma gondii*.

INTRODUCTION

Toxoplasma gondii is the agent of a cosmopolitan anthropozoonosis: toxoplasmosis. This intracellular parasite maintains an optional heteroxenous cycle between cats (definitive hosts) and other warm-blooded animals (intermediate hosts).

Toxoplasmosis is almost always asymptomatic but can be severe in immunocompromised individual or after congenital transmission. The medical and veterinary importance of toxoplasmosis drives for 50 years numerous epidemiological studies to identify the reservoirs and modes of transmission of the parasite (Try et al., 2000).

The consumption of raw or undercooked meat containing cysts of the parasite and the ingestion of oocysts with fruits contaminated with faeces of cats are the two main modes of contamination. More recently, the consumption of water contaminated with oocysts was identified as a risk factor for toxoplasmosis in Brazil (Bahia - Oliveira et al., 2003). Waterborne outbreaks have been causing symptomatic toxoplasmosis sometimes fatal in Panama (Benenson et al., 1982), Canada (Bowie et al., 1997) and Brazil (Taverne, 2002). The seroprevalence of human toxoplasmosis varies according to geographical areas. In

Table 1. Positive results of the first serology according to the type of antibody.

Reasons for consultation (S1)	Positive serology		IgM+/IgG-		IgM-/IgG+		Ig M+/Ig G+		IgM +/IgG+		Ig M+-/Ig G-	
	Nber	%	Nber	%	Nber	%	Nber	%	Nber	%	Nber	%
Review of pregnancy	73	89.02	5	6.1	38	46.34	25	30.49	4	4.87	1	1.22
Repeat abortion	9	10.98	5	6.1	0	0	4	4.87	0	0	0	0
Divers (bilan)	0	0	0	0	0	0	0	0	0	0	0	0
Total	82	100	10	12.2	38	46.34	29	35.36	4	4.87	1	1.22

T: rate; Nbre: Number.

Table 2. Distribution of serological tests based on reasons for consultation and IgM antibodies.

Reason for consultation	Serological examination	IgM antibodies rate (S1)					
		Positive		Traces		Négative	
		Nber	%	Nber	%	Nber	%
Review of pregnancy	165	30	16.76	5	2.79	130	72.63
Repeat abortion	13	9	5.03	0	0	4	2.23
Autres (bilan)	1	0	0	0	0	1	0.56
Total	179	39	21.79	5	2.79	135	75.42

T: rate; Nbre: Number.

Europe, it is 30 to 50% in majority of the countries in central and west and becomes less than 30% in the north. Low prevalences are recorded in North America, Southeast Asia and some African countries (Niger, South Africa) (Try et al., 2000). The highest prevalence (> 60%) occurs primarily among the countries bordering the Gulf of Guinea and Latin America. These differences are mainly due to the larger survival of oocysts in humid climates. There are few infections in areas where cats are absent (Dubey et al., 1997). Oocysts have a central role in transmission of the parasite, because they infect humans directly, or indirectly through animals for slaughter. From the perspective of assessing the risk of toxoplasmosis associated with oocysts, it is necessary to determine the prevalence of oocysts in the environment. This is only possible with methods specific and sensitive detection, because the probability of isolating oocysts in naturally contaminated random sample is very low. Study the prevalence of toxoplasmosis in herbivores is also an interesting way to indirectly assess the prevalence of oocysts in the environment.

The objective of the work presented here is part of the concern quite recent to evaluate the effectiveness of spiramycin in the treatment of toxoplasmosis in infected women in Dakar. To do it, they will all receive the same treatment with spiramycin (Rovamycine 3 million International Units (IU)) 1 tablet morning and evening and serology control every month to assess their serological profile and ultrasound control every 2 months.

METHODOLOGY

Immunoassay solid phase Orgenics SA (Immunocombs) was used based on ELISA principle insoluble support shown by the combs and a developing tank with a pre-serum dilution for the determination of immunoglobin M (IgM) antibodies accordance with the manufacturer's instructions. The positivity threshold of 10 IU/ml for immunoglobin G (IgG) and CombScals (card color matching concentrations) to determine the title. The IgM follows the same principle, but here the test is qualitative. The serological profiles of sera from patients already infected after treatment with spiramycin a month apart was later determined.

RESULTS

The study population consisted of 82 toxoplasmosis serology-positive women at the laboratory of the Abass NDAO Hospital. They all received treatment and met free serological tests. 82 patients were infected in the first serology (S1): 38 (46.34%) with either a recent active infection is an old chronic infection; 29 (35.36%) is a recent active infection; 10 (12.2%) had a recent infection or early non-specific IgM antibodies fixation; 4 (4.87%) had a former active or chronic infection and one (1.22%) had a recent infection or early attachment non-specific IgM antibodies (Table 1).

For IgM antibodies (44/179 or 24.58%) with 39 (21.79%) positive and frankly dubious 5 (2.79%) in the first serology (S1) carriers (Table 2), they were all ne-gative in the second serology (S2). It shows that 39.65% (71 positive/179 tested) were positive for IgG antibodies to S1 with a title between 10 and 50 IU/ml (68, including 64 for assessment of pregnancy) and between 50 and 100 UI/ml (3 total for assessment of pregnancy) (Table 3). To S2, it shows that 90 (24%) were carriers (74 positives/82 tested) with 89 (02%) title between 10 and 50 IU/ml (73/82, including 68 for assessment of pregnancy

Table 3. Distribution of serological tests based on reasons for consultation and IgG antibodies.

Reason	IgG antibodies rate (S1)							
	Negative		Positive					
	T<10 UI/ml		10≤T<50 UI/ml		50≤T<100 UI/ml		T≥100 UI /ml	
	Nber	%	ber	%	Nber	%	Nber	%
Review of pregnancy	98	54.75	64	35.75	3	1.67	0	0
Repeat abortion	9	5.03	4	2.23	0	0	0	0
Divers (bilan)	1	0.56	0	0	0	0	0	0
Total	108	60.34	68	37.98	3	1.67	0	0

T: rate; Nbre: Number.

Table 4. Positive serology results of the second depending on the type of antibody

Reason	Positives serology		IgM+/IgG-		IgM-/IgG+		IgM+/IgG+		IgM+-/IgG+		IgM+-/IgG-	
(S2)	Nber	%	Nber	%	Nber	%	Nber	%	Nber	%	Nber	%
Review of pregnancy	69	93.24	0	0	69	93.24	0	0	0	0	0	0
Repeat abortion	5	6.76	0	0	5	6.76	0	0	0	0	0	0
Total	74	100	0	0	74	100	0	0	0	0	0	0

T: rate; Nbre: Number.

Table 5. Distribution of positive serology based on IgG titer in the first control.

Reason	IgG antibodies rate (S2)							
	Negative		Positive					
	T<10 UI/ml		10≤T<50 UI/ml		50≤T<100 UI/ml		T≥100 UI/ml	
	Nber	%	Nber	%	Nber	%	Nber	%
Review of pregnancy	4	4.88	68	82.92	1	1.22	0	0
Repeat abortion	4	4.88	5	6.1	0	0	0	0
Total	8	9.76	73	89.02	1	1.22	0	0

T: rate; Nbre: Number.

Table 6. Distribution of positive serology based on IgG titer in the second control.

Reason	Positives serology		IgM+/IgG-		IgM-/IgG+		IgM+/IgG+		IgM +/IgG+		IgM+-/IgG-	
(S3)	Nber	%	Nber	%	Nber	%	Nber	%	Nber	%	Nber	%
Review of pregnancy	69	93.24	0	0	69	93.24	0	0	0	0	0	0
Repeat abortion	5	6.76	0	0	5	6.76	0	0	0	0	0	0
Total	74	100	0	0	74	100	0	0	0	0	0	0

T: rate; Nbre: Number.

pregnancy) and 1.22% with a titer between 50 and 100 IU/ml (1 in total for assessment of pregnancy) (Tables 4 and 5). To the third serology (S3), all were positive for IgG serology at a rate 10 UI/ml and strictly less than 50 (74/74 with 69 for assessment of pregnancy) (Tables 6 and 7).

DISCUSSION

The disappearance of IgM antibodies between the first and second serology would not rule on the effectiveness of treatment of toxoplasmosis Spiramycin because it obeys the normal kinetics of these antibodies. However, the disappearance of IgM antibodies for 5 patients then traces the development of IgG antibodies at a rate equal to 10 IU/ml in three of them, including two women for an assessment of pregnancy and 1 abortion record repeatedly could attest to the effectiveness of treatment for preventing infection to develop. This efficiency is more significant in three women to balance pregnancy with a high level of IgG antibodies (between 50 and 100 IU/ml), two of them which have seen their rates drop to the

Table 7. Distribution of positive serology based on IgG titer in the second control.

Reason	IgG antibodies rate (S3)					
	Positive					
	10≤T<50 UI/ml		50 ≤T<100 UI/ml		T≥100 UI/ml	
	Nber	%	Nber	%	Nber	%
Review of pregnancy	69	93.24	0	0	0	0
Repeat abortion	5	6.76	0	0	0	0
Total	74	89.02	0	0	0	0

T: rate; Nbre: Number.

second serology (between 10 and 50 IU/ml) and the last third serology. This study is the first of its kind in Dakar. These preliminary results may attest to the effectiveness of treatment undertaken. They are supported by Ajzenberg et al., (2010), in France who assessed the impact of treatment in patients with AIDS, who were cerebral toxoplasmosis and received specific treatment. He also arrived at the same conclusion by the marked improvement in CD4+ lymphocytes compared with those whose cause of immunosuppression was another. Gilbert et al., (2001) had shown that the treatment of the mother with spiramycin was effective because of the concentration of the product in the placental tissue and lack of teratogenic effects as fetal infection is not proven.

Couvreur and Leport (1998) had shown that spiramycin is not effective on fetal damage. Brézin et al., (2003), McAuley et al., (1994) and Roizen et al., (1995) proved the treatment of congenital toxoplasmosis to be ineffective. Few studies have been reported so far in the world. Although it has not been registered with congenital toxoplasmosis studies, Ndiaye et al., (2004) placed the risk of fetal infection to 4.88%, that is, a thousand pregnancies among toxoplasmosis serology-negative women. However, Baden et al., (2003) demonstrated the efficacy of treatment with cotrimoxazole on toxoplasmosis and other opportunistic infections in 417 heart transplant. However, it would be interesting to do a large-scale study, selecting patients, normalizing molecules and doses taken and assessing according to the different clinical forms recorded treatment.

Conclusion

Treatment of toxoplasmosis based on the administration of spiramycin (Rovamycine 3 million IU) in one tablet twice a day appears to be effective in the light of the results obtained in this study. All toxoplasmosis serology-positive who received treatment are cured with a threshold rate IgG antibodies (10 IU/ml) indicating an immunological memory. But, as a precaution, it would be interesting to extend this to a much larger population corroborating treatment with different clinical cases of toxoplasmosis in order to make a final decision.

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