Research Note:

OCULAR TOXOPLASMOSIS IN AN AMAZONIAN JAPANESE SETTLEMENT

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Abstracts: Infection with *Toxoplasma gondii* is a frequent cause of retinal disease, and relatively high prevalence of the disease has been reported in Brazil. We experienced acquired and congenital forms of ocular toxoplasmosis in an Amazonian Japanese settlement, Tomé-Açu. Fundus photographs of the patients representing typical lesions of chronic retinitis are shown.

INTRODUCTION

The geographic distribution of toxoplasmosis is cosmopolitan, however the incidence varies from country to country. In Brazil, Lamb and Feldman (1968) reported that the prevalence of the infection was 52%, and particularly in the Amazonian area, it was as high as 56%. We also reported the distribution of anti-*Toxoplasma* antibodies for those living in an Amazonian Japanese settlement, Tomé-Açu (Sato *et al.*, 1989), in which we showed the overall prevalence of 75.2% without age or sex dependency. Our epidemiological study also revealed that some individuals were suffering from impaired vision. Thus in 1991, we tried to determine the prevalence of ocular toxoplasmosis in the same area by ophthalmic examinations and found out two cases with retinochoroidal lesions, which are described in the present report together with some epidemiological discussion.

SUBJECTS, MATERIALS AND METHODS

Study Area

The study area, Tomé-Açu (latitude 2°31' S, longitude 48°22' W), is located 125 km to the south of Belém, whose average temperature is 21-33°C and the rain fall in a year amounts 2,635 mm. The place, with natural

water networks by Amazon branches, makes highly vegetated flat area at 11-30 m above sea level. The Japanese immigrants have been settling there since 1962, and now 70 families with about 350 people are supporting themselves mostly by agriculture. The number of Japanese Brazilian inhabitants subjected to the present study was 102, aged from 5 to 85.

Serologic and Ocular Examination

Antibodies against *Toxoplasma gondii* were assayed by micro-titer method with Latex agglutination test (Toxo-test MT, Eiken KK, Japan). Titers equal to or higher than 1 : 32 were considered positive.

Ophthalmic examinations were conducted for those who complained of impaired vision, in August, 1991. After dilation, individuals were screened with direct ophthalmoscopy for the presence of posterior uveitis by the identification of inflammatory retinal or retinochoroidal lesions. Fundus photography was performed by using portable retinal camera and Ektachrome RD135 film (Kodak).

RESULTS

Case 1

The patient was a 42-year-old male who immigrated into Tomé-Açu in 1972. He was fond of eating raw

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Photo 1. Fundus photograph of the left eye of the Case 1. Superior to the macula is a yellowish-white atrophic lesion with partially pigmented indistinct margin.

meat and used to eat sliced pork uncooked. The last episode of eating raw pork was with his neighboring friend, one year before the onset of the disease. In 1974, he began to complain the impairment of vision in the inferior nasal field in the left eye, and was treated with a anti-malarial drug. A fundus photograph taken in 1991 is shown as Photo 1. An unilateral yellowish-white atrophic lesion with partially pigmented indistinct margin, was observed located superior to the macula in the left eye. Antibody titer against *Toxoplasma* was 1:1024 in 1991. As a matter of fact, the friend of his who ate the raw meat together had become symptomatic of ocular toxoplasmosis 9 months prior to the Case 1's onset, and went back to Japan to be treated. (The detail of the history is unknown). Thus, the route of transmission to the Case 1 was considered to be from consumption of cyst-infected raw meat in the diet.

Case 2

The patient was a 13-year-old boy who had been blind from birth in the left eye, and was complaining of the defect of the superior nasal field of vision in the right eye. Strabismus was also observed in the left eye. Fundus photographs are shown as Photo. 2A and 2B.

Photo 2A. Fundus photograph of the right eye of the Case 2, in which an atrophic lesion, whitish-gray with pigmentation, lies in the macular region with a well-delineated border.

Photo 2B. Fundus photograph of the left eye of the Case 2. The same findings as in the right eye are noted.

Table 1 Anti-Toxoplasma antibody titers of the Case 2's family

Year	(Age*)	1988	1989	1990	1991
Mother	(35)	2,048**	4,096	2,048	
Father	(37)	512			
Case 2	(13)		32,768	2,048	2,048
Sister	(11)		32,768	8,192	
Brother	(9)		32,768	2,048	

*Ages in parentheses are those in August, 1991.

**Antibody titers are represented in reciprocal.

In both photographs, bilateral atrophic lesions, whitish-gray with pigmentation, were observed in the macular regions with well-delineated borders. Thus, the patient was thought to have been suffering from congenital ocular toxoplasmosis. Antibody titers against *Toxoplasma* are shown in Table 1. At the time of our survey, no other clinical manifestations of congenital toxoplasmosis were recognized on this patient.

Case 2's Family

Antibodies to *Toxoplasma* for the Case 2's parents and 2 siblings were also measured, and the titers were shown in Table 1. His mother manifested considerably high titers at 1 : 2048 (1988 and 1990) and 1 : 4096 (1989), and also his father showed positive titer at 1 : 512 (1988). Although his sister and brother showed the titers as high as 1 : 32,768 in 1989, ocular toxoplasmosis was not recognized on either of them. The family was keeping several cats in the house and the children were making close contact with the cats, playing often with them or even sleeping with them.

DISCUSSION

Acquired toxoplasmic chorioretinitis was once thought to be uncommon, however in Brazil, ocular toxoplasmosis has been reported to comprise approximately 50% of all uveitis, and incidence of acquired subclinical toxoplasmic infection that causes retinochoroiditis is considered much more frequent than previously believed (Silveira *et al.*, 1988; Glasner *et al.*, 1992). Besides, the Brazilian are usually fond of eating beef well charcoal-grilled so called "churrasco" and rarely eat raw meat, however, Japanese Brazilians have a preference for eating them raw, like "sashimi" or "shabu shabu", as the Case 1 practiced. This custom of eating may increase their chance to contract ocular toxoplasmosis. In the context of the control of the disease, particular attention has to be paid among the Japanese

settlers.

Toxoplasmic retinochoroiditis is usually seen as a late manifestation of quiescent congenital forms of toxoplasmosis. Based on the various epidemiological studies, Stagno (1980) anticipated that approximately 6 of every 1,000 pregnant women will acquire toxoplasmosis during the 9 months of gestation. And the average incidence of congenital toxoplasmosis was reported to be 1:1000 live birth and 10% showed ophthalmic involvement (Kean *et al.*, 1991). The Case 2, unfortunately, suffered from this congenital ocular toxoplasmosis, manifesting central and bilateral lesions as are usually the case with congenital ones. Subsequent siblings of the Case 2 were thought to be protected by their mother's acquired immunologic defense mechanism, as one may theoretically expect them to be, and in fact, no ocular lesion was recognized on them. However, the considerably high antibody titers were detected for the family, so that their long-term and intense exposure to the organism was thought to be actually taking place. Their close contact with cats will be the most probable cause of their repetitive infections, although the survey of the oocysts produced from the cats have not been conducted.

Our previous serological study on the prevalence of toxoplasmosis in the same area (Sato *et al.*, 1989) also suggested the significant health hazard caused by the disease. Dedicated efforts have to be made for the control of toxoplasmosis in Tomé-Açu.

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