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***Toxocara cati* larvae in the eye of a child: a case report**Mohammad Zibaei^{1*}, Seyed Mahmoud Sadjjadi², Seyed Hamidreza Jahadi–Hosseini³¹Department of Parasitology and Mycology, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran²Department of Parasitology and Mycology, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran³Department of Ophthalmology, Khalili Hospital, Shiraz University of Medical Sciences, Shiraz, Iran

PEER REVIEW

Peer reviewer

Dr. Behrouz Ezatpour, Division of Parasitology, Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Iran.
Tel/Fax: +98–661–3204005
E–mail: bezatpour@gmail.com

Comments

Ocular infection with *Toxocara cati* is rare. It is good a report that showed a case of ocular toxocariasis. Molecular techniques can be used to confirm diagnosis.
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ABSTRACT

Toxocariasis is a consequence of human infection by *Toxocara* larvae. There are symptomatic (visceral, ocular) and asymptomatic course of toxocariasis. The ocular form is very rare. We present a 6–year–old patient who developed an ocular form of toxocariasis caused by *Toxocara cati*. He demonstrated lesions in the peripheral retina of the right eye. White granuloma was present in the superior peripheral retina. A positive immunological assay for toxocariasis essentially completed the outcomes. On the basis of clinical manifestations and conducted examinations, a diagnosis of ocular form of toxocariasis was established. Albendazole and corticosteroids were applied in treatment. Current results clearly highlight the usefulness of excretory–secretory antigens derived from larvae of *Toxocara cati* for the fine diagnosis ocular larva migrans caused by *Toxocara* larvae.

KEYWORDS

Toxocara cati, Ocular larva migrans, Immunodiagnosis**1. Introduction**

Toxocara is a nematode parasite, commonly found in dogs [*Toxocara canis* (*T. canis*)] or cats [*Toxocara cati* (*T. cati*)]. Humans can be infected by ingesting the ova from dirt contaminated by dog or cat feces[1]. The disease may also result from eating of larvae in uncooked meat of infected parasitic hosts such as chicken, cattle and sheep[2]. Ingested ova produce larvae in the human intestine that invade the intestinal walls, penetrate the blood vessels and lymphatic system, and produced to the liver, lung, and eyes. *Toxocara* larvae may have a predilection for the retina,

which is known as ocular larva migrans (OLM)[3]. As the larvae move through the retinal tissue, they leave tracks and can cause hemorrhage, necrosis, inflammation and ocular lesions that often lead to loss of vision in the affected eye[4].

Diagnosis of ocular toxocariasis is based on clinical findings and specific laboratory tests. An enzyme–linked immunosorbent assay (ELISA) specific using *Toxocara* excretory–secretory (ES) antigen has been developed. Many authors have reported ocular *T. canis* infection[5,6]. Here, we present the case of a 6–year–old boy with ocular toxocariasis who had positive antibodies response to *T. cati* ES antigen.

*Corresponding author: Mohammad Zibaei, Ph.D, Department of Parasitology and Mycology, School of Medicine, Alborz University of Medical Sciences, Karaj, P.O. Box 31485/561, Iran.

Tel/Fax: +98–26–34319188
E–mail: zibaeim@sums.ac.ir

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2. Case report

A 6-year-old boy was admitted to the Department of Ophthalmology at Khalili Hospital, Shiraz University of Medical Sciences with fever of unknown reasons for 3 months. He complained of blurred vision in the right eye. The ophthalmoscope revealed lesions in the peripheral retina of the right eye. White masses were present in the superior peripheral retina, with cells in the vitreous. The track of larvae revealed in the fundus examination (Figure 1). Laboratory tests showed a white blood cells count of $8500/\mu\text{L}$ with 17% eosinophilia; and platelet count, $23.4 \times 10^4/\mu\text{L}$. Serum chemical examination results were AST, 65 IU/L; ALT, 115 IU/L; and total bill, 0.77 mg/dL (Table 1). Results of the examination of feces for the presence of eggs and larvae of parasites were negative. Antibodies specific to *Toxocara* purified ES antigens were detected in the serum sample and vitreous fluid by ELISA.



Figure 1. Fundus photograph showing white lesions caused by the migration of *T. cati* larvae (arrows).

Table 1

Results of patient's blood cell count and serum chemical examinations.

Indicator	The patient's values	Normal
White blood count ($\times 1000/\mu\text{L}$)	8.51	5.0–14.5
Red blood count ($\times 10^6/\mu\text{L}$)	4.56	3.9–5.3
Platelets ($\times 10^3/\mu\text{L}$)	234	150–440
Eosinophil (%)	17.0	2.0–7.0
Erythrocyte sedimentation rate (mm/h)	27.0	0.0–15.0
AST (IU/L)	65.0	57.0–67.0
ALT (IU/L)	115.0	112.0–118.0
Total protein (mg/dL)	0.77	0.1–1.2
Uric acid (mg/dL)	55.4	3.6–8.2

Antibodies titer against *T. cati* was strongly positive (ELISA) in sera and vitreous fluid with the third-stage larvae ES antigen. Antibodies titers in sera for ascariasis,

trichostrongyliasis, hydatidosis, toxoplasmosis, and leishmaniasis were negative. ELISA using *T. canis* ES antigen showed a low antibodies titer in the patient serum. The patient was treated with albendazole (400 mg twice daily) and oral prednisolone for 3 weeks. Two months later, the patient was improved following treatment.

3. Discussion

Human toxocariasis is a common helminth zoonosis that has a worldwide distribution and is also endemic in the Iran. Sero-epidemiological studies in Iran report a *Toxocara* seroprevalence rate of 25.6% amongst the children and up to 5.2% amongst people at risk[7,8]. In a study, we have previously reported that 42.6% of stray cats in our area were positive for *T. cati*[9].

Ocular abnormalities are a frequent complication of toxocariasis. Ocular toxocariasis is typically a monocular disease of young children. Patient with this disease present with chronic unilateral uveitis and a marked vitreous opacification that overlies a primary eosinophilic granuloma. Exudative retinal detachment, posterior synechiae, and a cyclitic membrane may be present. *Toxocara* granuloma is white, dome-shape, and confined principally to the retina[10]. Serological tests like ELISA with *Toxocara* infective larval ES antigen is the gold standard for diagnosis of ocular toxocariasis.

In our case, serum eosinophilia early suggested a possible helminthic infection. Peripapillary lesions with a highly reflective mass protruding from the thickened retina into the vitreous observed in ophthalmoscopy. In the case discussed here, ELISA using *T. canis* ES antigen showed that antibodies titer was lower, whereas using *T. cati* ES protein revealed high antibodies titer. Hence, we believe that ocular toxocariasis is caused by *T. cati*. In a study examining the serodiagnosis of ocular toxocariasis, Sakai *et al.* reported that *T. cati* could cause ocular toxocariasis in human[11].

However, it was our choice to combine anti-helminthic therapy and use steroids for 4 weeks which led to clinical and ophthalmologic improvement corroborating the diagnosis of ocular toxocariasis. The use of steroids is controversial that should be administered in ocular involvement[12]. As evidenced by clinical recovery and ophthalmology improvement in our patient, we suggest

simultaneous administration of immunosuppressant and albendazole in ocular infection by *T. cati* larvae.

We concluded that although ocular involvement is common in toxocariasis with *T. canis*, an ocular infection caused by *T. cati* is rare. It draws attention of ophthalmologists to the possibility of ocular toxocariasis particularly in the children with eosinophilia and that ocular involvement can be caused by *T. cati*, and a test using *T. cati* ES should be performed to confirm the disease.

Conflict of interest statement

We declare that we have no conflict of interest.

Comments

Background

Toxocariasis is a consequence of human infection by *Toxocara* larvae. There are symptomatic (visceral, ocular) and asymptomatic course of toxocariasis. The ocular form is very rare. The authors of this paper presented a 6-year-old patient who developed an ocular form of toxocariasis.

Research frontiers

The current report presents a 6-year-old patient who developed an ocular form of toxocariasis.

Related reports

Ocular toxocariasis was based on clinical findings and the presence of vitreous antibodies. Sakai *et al.* reported that *T. cati* could cause ocular toxocariasis in human.

Innovations and breakthroughs

To my knowledge, this is the first report of ocular toxocariasis caused by *T. cati* and diagnosed by immunoassay in our area.

Applications

It draws attention of ophthalmologists to the possibility of ocular toxocariasis particularly in the children with eosinophilia and that ocular involvement can be caused by *T. cati*, and a test using *T. cati* ES should be

performed to confirm the disease.

Peer review

Ocular infection with *T. cati* is rare. It is a good report that showed a case of ocular toxocariasis. Molecular techniques can be used to confirm diagnosis.

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