

# A Rare Cause of Hypereosinophilia: A Case Report

Nadir Bir Hipereozinofili Nedeni: Olgu Sunumu

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## ABSTRACT

Toxocariasis is a parasitic disease caused by the larval stage of *Toxocara cati* and *T. canis*, which live in the intestinal system of cats (*T. cati*) and dogs (*T. canis*). Infective eggs can enter the gastrointestinal system by the oral route via foods contaminated with feces of dogs or cats or via dirty contaminated hands. The larvae penetrate the small intestine and migrate to visceral organs by systemic circulation. Hypereosinophilia is a common finding in the tissue invasion of parasites. Serological methods are the principle diagnostic methods for toxocariasis. In this study, we reported a toxocariasis patient presented with hypereosinophilia, hepatomegaly, and intestinal involvement. Computed tomography showed diffuse thickening of the ileal bowel loop walls around the umbilicus. Endoscopic ultrasonography revealed an enlarged periduodenal lymph node. Symptoms improved with albendazole treatment with a subsequent flare.

**Keywords:** *Hypereosinophilia, toxocariasis, atypical zoonosis*

## ÖZ

Toksokariasis, kedi ve köpeklerin barsaklarında yaşayan *Toxocara canis* ve *Toxocara cati*'nin neden olduğu parazitik bir hastalıktır. Enfektif yumurtalar kedi-köpek dışkıyla kontamine olmuş besinlerle veya iyi yıkanmamış kontamine ellerle oral yoldan gastrointestinal sisteme girebilir. Barsaklardan penetre olan larvalar iç organlara yerleşebilirler. Parazitlerin dokuya invazyonu sonucu hipereozinofili sık görülen bir bulgudur. Serolojik testler toksokaryozis tanısı konulmasındaki temel tanı yöntemidir. Biz bu olguda hipereozinofili, hepatomegali, ve barsak tutulumu ile prezente olan bir toksokariasis vakasını bildirdik. Bilgisayarlı tomografide göbek etrafındaki ileal barsak anslarında yaygın duvar kalınlaşması görüldü. Endoskopik ultrasonografide büyümüş periduodenal lenf nodu saptandı. Semptomlar albendazol tedavisi aile düzelerken takip eden bir alevlenme görüldü.

**Anahtar Kelimeler:** *Hipereozinofili, toksokariasis, atipik zoonoz*

## INTRODUCTION

Toxocariasis is a parasitic disease caused by the larval stage of *Toxocara cati* and *T. canis*. *T. cati* lives in the intestinal system of cats, and *T. canis* lives in the intestinal system of dogs and foxes. Infective eggs can enter the gastrointestinal system by oral route via foods contaminated with feces of these animals or via dirty hands.

Larvae entering the gastrointestinal tract via oral pathway penetrate the intestinal membrane and take years to reach the tissues (1). The larvae passing into the systemic circulation may go to the liver first and then they may go to other organs or tissues from liver by using the vascular system. The larvae never mature in a human body, because

it is not a natural host for them. Such hosts, in which the larvae cannot complete their life cycle, are called paratenic hosts. Rodents, chicken, sheep, pigs, and birds are also other paratenic hosts for larvae (2). The parasite completes its life cycle in dogs and foxes (*T. canis*) and cats (*T. cati*) (2-4). Human toxocariasis can cause some diseases. There are three main syndromes: visceral larva migrans (VLM), ocular larva migrans (OLM), and covert toxocariasis, which is a milder version of VLM (5). VLM is a systemic form of toxocariasis; the patients can present with symptoms such as fever, hepatomegaly, stomach ache, hypereosinophilia, hypergammaglobulinemia, hepatosplenomegaly, cough as a result of lung involvement, skin lesions, and headache (6, 7). Main laboratory findings of VLM are eosinophilia, leukocytosis,

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and high IgE levels (8). OLM is toxocariasis of the eye and has a wide range of clinical findings (9).

Serological tests also become important for the discrimination of the different parasitic infections. Biopsy is not very effective at detecting larvae; therefore, serological tests that detect excretory–Secretory (ES) antigens of second-stage larvae are used (6). Serological methods, such as Excretory–Secretory–Enzyme Linked Immunosorbent Assay (ELISA-ES), are reliably used tests for diagnosis (10, 11). Additionally, Western blotting (WB) is another serological test frequently used in detecting anti-*T. canis* antibodies. Use of ELISA and WB tests for ES antigens in serological diagnosis of *Toxocara* infections in humans has been reported to be highly sensitive and specific by many researchers (2, 10-12). When WB and ELISA were compared, both methods were found to have a good correlation with each other (13). In this article, we aimed to report a toxocariasis case that presented with hypereosinophilia and systemic symptoms.

## CASE REPORT

A 39-year-old female patient presented to a hospital in the city Van with 37°C body temperature; she had pain from epigastric region to back for three months. She also had a history of irritable bowel syndrome. Abdominal computed tomography (CT) showed diffuse thickening of the ileal bowel loop walls around the umbilicus. Endoscopic ultrasonography revealed an enlarged periduodenal lymph node of 17x14 mm in size, and revealed also mesenteric lymph nodes of which the largest were 12 mm in size. Upper endoscopy revealed gastroduodenitis. Colonoscopy findings of the patient were compatible with eosinophilic colitis and hemorrhagic colitis. Laboratory values were as follows: hemoglobin: 14.5 g/dL (11–18), eosinophils: 1800/mm<sup>3</sup> (0–420), CRP: 20.6 mg/L (0–5), leukocytes: 12800 thousand/mm<sup>3</sup> (4.000–11.000), and IgE: 17.3 IU/mL (0–100). *Fasciola* serology of the patient was positive. With these findings, albendazole therapy was administered for ten days. After the therapy, the patient's condition ameliorated. However, two weeks after the end of therapy, the patient's complaints started again, and she was referred to Akdeniz University Hospital. Physical examination revealed hepatomegaly but no lymphadenopathy. In fecal smear test, there were no parasites. Laboratory values were as follows: creatinine: 0.74 mg/dL (0.5–0.9), leukocytes: 10140 thousand/mm<sup>3</sup> (4.800–10.800), eosinophils: 360 thousand/mm<sup>3</sup> (0–420), Erythrocyte sedimentation rate: 18 mm/h, and ALT: 20 U/L. Other laboratory values were within normal range. Liver was 210 mm and spleen was 123 mm on ultrasonography. *Fasciola* IgG ELISA serology was negative, and *Toxocara* WB serology was positive. The patient chose to be followed up by the previous medical center and went back from Antalya with her laboratory results.

## DISCUSSION

*Toxocara* sp. can be localized in many organs and tissues. Pulmonary symptoms like cough, wheezing, and allergic symptoms are seen in more than 80% of the patients (14). Severe infestations in the form of respiratory distress or myocarditis are rarely seen (14, 15). In addition, muscle involvement is frequently seen, and myositis symptoms such as pain, weakness, cramps may occur in larva migrans (6). Although some signs of tissue damage relat-

ed to growing and migrating of larva are observed, most clinical symptoms develop due to inflammatory response or hypersensitivity reactions.

Embryonated eggs hatch as second larvae in the small intestine of paratenic hosts, and the larvae penetrate intestinal mucosa. The larvae enter the bloodstream and spread to the lung, brain, heart, eyes, and other organs and tissues, especially liver (6, 16, 17). Liver involvement is quite common through the portal venous circulation.

Hypereosinophilia is seen as a result of invasion to tissue by the parasites, but hypereosinophilia is not a specific indicator of toxocariasis. Bacterial and parasitic infections, drug sensitivity, asthma, allergic rhinitis, and eczema may cause hypereosinophilia. Additionally, Addison's disease, acute eosinophilic leukemia, and myeloproliferative disorders may also cause hypereosinophilia. Lastly, eosinophil count more than 1,500/mm<sup>3</sup> for more than six months with concurrent organ involvement and without any known etiology is called idiopathic hypereosinophilic syndrome. Leucocytosis, gastroenterological involvement, and hepatomegaly were also seen with hypereosinophilia in our patient. With these findings, parasitic infection was considered and WB test was performed. *Toxocara* diagnosis was confirmed with WB test.

Toxocariasis rarely requires treatment, because the disease is generally self-limiting. Treatment is indicated only in cases of organ involvement. Although medical therapy is the main treatment, surgical therapy is also required in cases with eye involvement. Recommended treatment is 500 mg albendazole twice daily for 5 days (18). Mebendazole and benzimidazole could also be used in the treatment. Corticosteroids are used for termination of the inflammatory response at the sites of spread of dead parasites' antigens and are only used in eye involvement (19).

In Turkey, very little study has been done on *Toxocara* prevalence. Gungor et al. (12) reported that *Toxocara* seroprevalence in Turkey is between 28.57% and 51.35%. Many of the adults and children who have positive *Toxocara* serology are asymptomatic. However, toxocariasis must be kept in mind when a patient with hypereosinophilia presents with any rare clinical signs of toxocariasis such as hepatomegaly. Furthermore, toxocariasis should be considered in differential diagnosis in any other organ or system specific symptoms, such as neurotoxocariasis reported by Kivrak et al. (20).

## CONCLUSION

In patients with hypereosinophilia, diagnosis can be easily made with *Toxocara* serological tests in case of clinical suspicion. Toxocariasis should always be kept in mind especially when patients present with hypereosinophilia; after diagnosis, patients may easily become healthy in a short time with an appropriate treatment approach.

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