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A CASE OF TOXOCARIASIS INFECTION MANIFESTING AS RECURRENT BRONCHITIS

Medicine

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ABSTRACT

Toxocaridae are nematodes belonging to the order of Ascaridae which commonly infects dogs and cats. In humans, the larvae do not develop into adult worms, but migrate to various tissues and organs and may survive for several years, inducing a number of clinical symptoms. Thus, clinical manifestations vary and are classified according to the organ affected. *Toxocara canis* is common in tropical areas and in less developed countries, but is not so rare in industrialized countries. Here we report the case of a patient who suffered from recurrent bronchitis caused by *T. canis* infection. The correct diagnosis was established after detecting anti-Toxocara antibodies by ELISA and improvement of signs and symptoms after specific treatment was observed. This suggests the possible role of *Toxocara Canis* in inducing pulmonary inflammation, in particular, recurrent bronchitis.

KEYWORDS

Toxocariasis, visceral larva migrans, *Toxocara canis,* allergy, helminths, recurrent bronchitis.

Toxocariasis is the clinical term used to describe one of the most commonly reported zoonotic helminth infections caused by the larval stages of the ascaridae *Toxocara canis*, common roundworm of dogs, and probably also by the larval stages of *Toxocara cati,* roundworm of cats. The clinical spectrum of toxocariasis in humans varies from asymptomatic infection to severe organ injury caused by larval migration to the major organs ("visceral larva migrans"). As with other helminth zoonoses, the infective larvae of these *Toxocara* species cannot mature into adults in the human host but the worms spread through organs and tissues (mainly the liver, lungs, myocardium, kidney and central nervous system) and cause local and systemic inflammation, resulting in the "larva migrans" syndrome. Subclinical infection often covert to toxocariasis (Despommier, 2003); (Pinelli, Kortbeek, and Van der Giessen, 2005); (Schantz, 1989). Infection from this helminth plays a crucial role in the development of allergic immunopathology and successive clinical manifestations (Qualizza, Incorvaia, Grande, Makri, and Allegra, 2011); (Qualizza, Megali, and Incorvaia, 2009) so this infection does not appear to protect against allergies, as proposed by the hygiene hypothesis (Smits, Everts, Hartgers, and Yazdanbakhsh, 2010); (Strachan, 2000). *Toxocara* infection has a role in the induction of Th2 cells that produce cytokines, such as IL–4, IL-5, and IL-13, which induce responses to the parasite, such as increased IgE levels and eosinophilia (Del Prete, De Carli, Mastromauro, Biagiotta, Macchia, Falagiani, Ricci, and Romagnani 1991); (Coffman and Mosmann, 1991). This infection, from various studies using murine models for toxocariasis, has been seen to be a cause of persistent pulmonary inflammation, IgE production, eosinophilia, airway hyper-reactivity and production of Th-2 type cytokines (Buijs, Egbers, Lokhorst, Savelkoul, and Nijkamp, 1995) (Kayes, 1986); (Pinelli, Withagen, Fonville, Verlaan, Dormans, Van Loveren, Nicoll, Maizels, and van der Giessen J., 2005). Pulmonary inflammation develops after no less than 48 hours and can persist up to 2 or 3 months (Pinelli et al., 2005); (Buijs, Lokhorst, Robinson, and Nijkamp, 1994). Granulomas develop within a week and can be located at the anterior musculature, at the liver, kidneys, heart and sometimes at the eye (Kayes, 1997). By analysis of cell composition in bronchoalveolar lavage (BAL), at two weeks post infection (p.i.), it has been seen that eosinophils account for more than 75% of the recovered cells compared to 25% in peripheral blood (Kayes, Jones, and Omholt, 1987).

Case report

The patient is a 4 year-old female with negative history of smoking and asthma, and only seasonal rhinoconjunctivitis. In March 2013 she had a first episode of mucopurulent bronchitis, that was treated with Levofloxacin. Following further episodes of bronchitis at monthly intervals, all treated with antibiotics, and the occurrence of rhinitis symptoms, the patient underwent diagnostic evaluation, including thorax computed tomography (CT), which revealed bronchiectasis with dense content, small nodular opacities with a "tree-in-bud" sign, small clumps of inflamed tissue and ground-glass opacities. Allergy testing showed positive results to skin prick test (SPT) with ragweed pollen, and sIgE value was 28 kUA/I. Total IgE value was 252 kUA/I (nv<100), IgM 254 mg/dl (nv<230), eosinophilia 1.90% (nv<10%) and parasitologic examination of stools was negative. The ELISA test for IgG antibodies to *Toxocara* was positive, therefore treatment with albendazole was prescribed. After treatment, the patient had no further bronchitis episodes. In January 2015, a second CT showed the disappearance of all radiologic abnormalities except bronchiectasis, but with clean aspect.

Conclusions

This clinical case confirms the need to look for *Toxocara* infection in patients with persisting respiratory symptoms who are unresponsive to medical treatment. Anti-*Toxocara* treatment dramatically improved symptoms leading to complete recovery.

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