CLINICAL AND EXPERIMENTAL STUDY ON A PULMONARY TOXOCARIASIS CASE

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Abstract. This is the case of a 46-year-old patient from the countryside, non-smoking, without a history of allergy, who isn't exposed to toxic or harmful work. At admission to the hospital he presented cough, weight loss, mild leukocytosis with hypereosinophilia, fatigue and dyspnea. The symptoms that have determined the patient to address the therapy department at the County Hospital from Cahul, have appeared two months before hospitalization. At admission, the case has been classified as a pneumonia case due to the radiology image (inhomogeneous opacity left lobe of the lungs, the lower portion), but also through frequent outbursts of coughing and a slight fever. The diagnosis of toxocariasis has been confirmed through immunological and serological tests with IgG (6.14) in combination with eosinophilia with 39.3% values. After about 5 months, the patient addresses with slightly different symptoms.

Keywords: hematological study, antiparasitic treatment, parasitological infestation.

Introduction
Many people suffering of allergic diseases that can't be treated properly because of a wide complex of allergens that irritate continually the immune system. It's been proved that the parasites also (helminth – pathogenic protozoa) cause strong and long lasting allergization of the organism through their metabolic products with strong allergenic properties. The parasitic allergy can clinically be manifested through chronic relapsing urticaria, swelling of the skin, joint and muscle pain, increased body temperature, cutaneous pruritus, burning sensation in the skin, asphyxia, asthmatic cough, functional disorders of the intestine etc. These symptoms can be testified to hepatitis, myocarditis, pancreatitis and allergic rhinitis.

Methods of Study
While studying this clinical case, there were implemented many research methods in order to establish the final diagnosis (Gillespie & Pearson, 2001). There were used different methods: radiological examination, tuberculin Mantoux reaction, laboratory
clinical investigations, hematological and biochemical, coproparasitological and, also, immunological and serological tests to confirm the previous toxocariasis diagnosis.

Results and Discussion

General data. Toxocariasis is a zoonosis, caused by a nematode like *Toxocara canis* (dog), *Toxocara cati* (cat) or *Toxocara leonine* (fox). Toxocariasis is an illness described for the first time in 1952 by Beaver and it has been classified as been met in an adult in a larval form (visceral larvae migrans, ocular larvae migrans and, also, an atypical trans-cutaneous form). The man presents an intermediate host for the parasite, where it doesn't get to maturity because of parasite impasse, due to the body reactivity and its autoimmune capacity driven on the parasite. The eosinophils are responsible of detecting, embedding and reducing the larvae's activity that through their activity form granulomas that encapsulate the toxocara larvae reducing its activity till disintegration (in some cases).

Visceral larvae migrans is primarily diagnosed in young children, but also in adult population, especially in those that practice pica. They don't respect the personal hygiene before eating or eat unwashed fruit or vegetables. The highest incidence of toxocara larvae forms infection is met in children between 2 and 5 years old. This is due to the close connection among this population and the infected animals, but also their incapacity to understand the risk presented by these parasites. Another predisposing factor would be the infected animals that defecate on children's playgrounds in parks and kindergartens. However, the infection with embryonated toxocara eggs can also be often met in adult population, especially in those from the countryside, because of the broken sanitary-epidemiological norms, but also the non-compliance of healthy living.

If considering the study done in town Cahul, you can see a slight predisposition to infection in people from the countryside. However, the insignificant difference in favor of rural population is supported by the increased vagrancy in the town, especially in parks and kindergartens zones.

The toxocariasis infection cases are frequently caused or determined by *Toxocara canis* species more than those from *Toxocara cati* species, due to several assumptions:

- there are more homeless dogs than cats;
- dogs defecate aleatory, unordered, while cats defecate in secluded areas, inaccessible, a bit underground (eggs embryos only on ground level, in optimal temperature and humidity conditions);
- friendship between man and dog is greater than between man and cat, so the infection degree in greater.

So, *Toxocara canis* is a 9 to 18 cm nematode length (female) or a 4 to 10 cm nematode length (male). Adult *Toxocara canis* are commonly met only in the dog's digestive tract, where the female lays from 20,000-200,000 eggs per day. In the digestive tract, they are unembryonated, but once on the ground, they embryonate after 2-5 weeks, becoming infected (L2 – second stage larvae) (Magnaval et al., 2001). This aspect is very important in order to prevent the infestation by avoiding the pica or unwashed fruit and vegetables ingestion.

After ingesting the embryonated eggs, they get into the small intestine, where they pierce the intestinal wall, migrating to the liver, lungs, eyes, brain and other visceral organs, through the blood flow (Chieffi et al., 2009). Because of the visceral migration you can see
affected tissue necrosis and eosinophilia – as a major response of the host to antigens on the surface of toxocara larvae (Santarem et al., 2011).

The chronic production of parasite antigen and the continuous stimulation of the immune system can lead to a permanent immune „alert”, that may underlie the respiratory manifestations or/and cutaneous, recurrent manifestations (Stürchler et al., 1987).

The clinical manifestations in toxocariasis are multiform (from case to case), with slight differences according the age, the weight and only sometimes according the gender (Sarada et al., 1993; Despommier et al., 2003). The most important biological changes are hypereosinophilia (over 40%), hyperleukocytosis (between 20 and 60 x 10⁹/l), positive immunological results in 70% of visceral larvae migrans etc.

**Case presentation.** The clinical and experimental study on a pulmonary toxocariasis case was carried out on one patient – L.M., male, 46 years old, nonsmoker, works on field daily as a sheep and cows shepherd. The symptoms that have determined the patient to address the general practitioner have been hot dry cough in rarely obstructive forms. He was a pathogenesis of cardiac (dystonia, predominantly hypertensive). He got incomplete ambulatory blood analysis, without leukocyte formula, that were indicating a leukocytosis with values of 10.2 – 9.7 x 10⁹/L, after what he was given antibiotics and expectorant.

After a period of 11 months, the patient has presented a severe cold, associated with cough, fever and chills that have determined him to address the care unit, asking to be consulted by an internist. From the anamnesis, the doctor has asked for an admission sheet for the patient, but also the necessary investigations in order to classify the case as a respiratory infection with suspected pulmonary tuberculosis.

The CXR done at admission has shown an opacity waved by some slightly bound edges in the left lobe. The patient's biological manifestations were indicating an unstressed anemia form (118.3 g/l), an inflammatory syndrome with ESR 72 mm/h, leukocytes within normal (WBC – 8.1 x 10⁹/l), eosinophilia with values of 28%. The biochemical testing hasn't shown any values with pathological significance.

Preliminary the tuberculosis suspect diagnosis has been determined. For its confirmation additional testing has been done by the bacteriological analysis of induced sputum Mycobacterium tuberculosis, and also the Mantoux test – positive only in case of tuberculosis. Both tests have been negative, so the preliminary diagnosis hasn't been confirmed.

Tests have continued with bronchoscopy and the eosinophilic pneumonia diagnosis has been determined due to the big number of eosinophils in the microscopic lavage. The antibiotics medication has been continued, afterwards the patient has been discharged. The case has been taken by the general practitioner, but without significant improvement changes in health.

After about 5 months, the patient is readmitted, presenting fever, headaches, gastrointestinal discomfort, leukocytosis and hypereosinophilia. At admission, the patient hasn't presented anemia, just a pronounced inflammatory process with values of ESR 78 mm/h and the fibrinogen 5.6 g/L.

The radiology and bronchoscopy tests have presented Loeffler's syndrome aspect that resembles to asthma in association with pulmonary eosinophilic infiltrates. The patient presented changes in the gallbladder determined by the ultrasound, but on palpation he presented pains in the lower right side, with suspected appendicitis. Monitored in dynamics,
the WBC has decreased significantly, getting to values of 7.2 – 5.7 x 10⁹/L. After excluding the aspergillosis suspicion, the doctor has asked the coproparasitologic testing, but also the immunological and serological test for anti toxocarasis (IgG); the serology for toxocara canis, positive IgG (6.33 UI) – this way the pulmonary toxocarasis diagnosis, with larvae migrans chronic syndrome.

Afterwards the treatment with Albendazol 800 mg/day is prescribed for 14 days and a month after the treatment parasitological, bacterioscopic and radiological analysis – to monitor in dynamic the reaction response of the body, but also to exclude the recurrence or aggravation of the illness.

A half a year later, the patient has addressed the general practitioner with obvious signs of health improvement. Ambulatory, coproparasitological, hematological and immunological tests on anti canis toxocaras have been done. Hematologically, the patient hasn't presented any pathology, the coproparazitologic test was been negative, but immunological – positive IgG (2.46 UI) – the Albendazol treatment 800 mg/day has been resumed for two weeks, this time associated with hepatoprotective. After this stage of the treatment, the general practitioner has considered necessary to record the patient as being with a high toxocarasis or risk helminthisis, asking for an annually CXR and also repeated immunological and serological tests taking into account the fact that this patient is permanently exposed to helminths infestation due to his job as a shepherd.

Conclusions
This case fits in the cases which start doesn't present specific features that would suggest such an affection. Even more, the quiet nature of the clinical expression that orients from the start to a tuberculous or neoplastic etiology. The case investigation leads to the amplification of the diagnostic option, as eosinophilia test results, but also data given by the bronchoscopic lavage. The good thing is that the TB bacteriology examination and also the endoscopic aspects have simplified the proves that were excluding the tuberculosis or the lung cancer, redirecting the attention to other diagnosis tracks. Finally, the immunological and parasitological test results have completed and proved the final determinations of the diagnosis.

According to studies, but also according to this study, the start of the parasitic diseases can delay the diagnosis determination, fact that can have serious and great health implications. Just a complete investigation, the treatment failure with inappropriated formulas, due to unsubstantiated results.

The accessibility to bacteriological, bacterioscopic, but also immunological and parasitological high performed investigations is a compulsory stage to eliminate the diagnosis that the physician is tempted to stop at. Fortunately, this patient has benefited of high performant medical investigations and qualified medical professionals. All this has helped in the determination of the final diagnosis - pulmonary toxocarasis.

References

