CLINICAL AND BIOLOGICAL FEATURES OF ADULT TOXOCARIASIS

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CLINICAL AND BIOLOGICAL FEATURES OF ADULT TOXOCARIASIS (Abstract): **Aim:** To determine the main clinical signs and symptoms of adult toxocariasis and the relationship between anti-Toxocara canis antibody levels, symptoms, and the other biological parameters. **Material and methods:** Prospective study conducted in the interval 2008 – 2011 in a series of 457 adult patients from Moldova, Romania. The ELISA method was used to detect the presence of IgG antibodies against T. canis. Fasting blood samples were collected from all patients who then underwent the following tests by standard methods: hemoglobin, hematocrit, eosinophils, lymphocytes, white blood cell count, SGOT, SGPT. **Results:** An IgG titer of 1/100 was most commonly found in case of allergies, physical asthenia, sensation of constriction in the anterior cervical area, right hypochondriac pain, paresthesies, nervousness (anxiety) and lipotimic states; a 1/50 titer was most often associated with hive reactions, dysphonia, lower limb edema, and pale/yellow axy skin. In patients with latero-cervical adenopathy the most frequent determinations were 1/100 (34.0%), followed by 1/50 (22.6%). **Conclusions:** The statistically significant clinical signs and symptoms may represent a starting point in making a diagnosis of toxocariasis. Of the non-specific laboratory findings we mention: hyperleukocytosis, hypereosinophilia and low hematocit, elevated transaminases level having a high sensitivity and specificity. The diagnosis of certainty is made by determining IgG for T. canis or the presence of larvae in the biopsy tissues. **Keywords:** T.CANIS, TOXOCARIASIS, CLINICAL DIAGNOSIS, BIOLOGICAL MARKERS

Human toxocariasis is a cosmopolitan helminthic zoonosis due to human parasitization by larvae belonging to species of the Toxocara genus. The most common source of human visceral larva migrans is Toxocara canis. "Larva migrans" syndrome was first described by Beaver and colleagues (1952) (1).

In 1954 Beaver mentions the dog as the main source of infection for parasitic diseases. Toxocariasis is a zoonanthroponosis with different clinical manifestations depending on the location of larva migrans, degree of activity and number of larvae. The parasitic disease caused by S2 larva is characterized by delayed growth, general, digestive, nervous, ocular and respiratory disturbances and many other pathologic actions (2,8,10,11,15). Hypereosinophilia, hyperleukocytosis, sometimes ESR and gammaglobulin elevation are biological changes commonly found in toxocariasis, most studies being conducted in children (1,9). For the serological diagnosis of Toxocara canis infection the
ELISA method is used.

The aim of this study was to determine the main clinical signs and symptoms of adult toxocariasis and the relationship between anti-\textit{Toxocara canis} antibody levels, symptoms, and the other biological parameters.

**MATERIAL AND METHODS**

This prospective study was conducted in the interval 2008 - 2011 on a series of 457 adult patients. Patient selection and analysis of medical records were in agreement with the health legislation in force. The study database, retrospective analytical study, was created by using history and physical examination data and interpretation of laboratory tests results.

Positive \textit{T. canis} contact was assessed by determining IgG antibody titer by ELISA method. In all patients the following laboratory test were done by standard methods in fasting blood samples: hemoglobin, hematocrit, eosinophils, lymphocytes, white blood cell count, SGOT, SGPT.

Data from patients’ medical observation sheets were entered into a Microsoft Excel spreadsheet, then statistically processed using SPSS 16.0. The numerical variables on subgroups defined by qualitative variables were compared by using ANOVA test.

The homogeneity of variances was checked by using Levene test. In cases where this condition was not met, to evaluate the same phenomenon we used the nonparametric Kruskal-Wallis alternative for rank comparison. We sought evidence of biological clinical features suggestive of a diagnosis of Toxocariasis and their correlation with IgG titer for \textit{T. canis}.

**RESULTS AND DISCUSSION**

All types of clinical manifestations were statistically significantly associated with positive Toxocara determination, except for stress/panic, sweating, palpitations, headache, dizziness and weight loss. \textit{T. canis} IgG titer of 1/100 was most commonly found in allergies, physical asthenia, feeling of constriction in the anterior cervical region, right upper quadrant discomfort, paresthesias, nervousness, and faintness; a titer of 1/50 was often associated with urticarial reactions, dysphonia, lower leg edema, pale / yellow- waxy skin.

In the patients with laterocervical adenopathy the most common determinations were 1/100 (34.0%), followed by 1/50 (22.6%), significantly statistically different from the values of the same determinations in patients without this diagnosis (21.4% and 19.7%, respectively) (fig. 1).

![Fig. 1. \textit{T. canis} IgG titer in the patients with laterocervical adenopathy](image-url)
The sensitivity and specificity for the diagnosis of toxocariasis of the performed biochemical tests was calculated in view of identifying the tests that could lead us to this diagnosis. We determined the ROC curve and interpreted the results. For being useful in making a diagnosis of toxocariasis, the area under the corresponding curve should be greater than 0.5, ie this curve to be placed above the reference line (gray-shaded in our graph). There are tests that can actually calculate with some significance the difference from the 0.5 value of this surface (fig. 2).

Then we calculated the area under the curve and tested the difference between this and the 0.5 threshold value. By analyzing the sensitivity and specificity for the diagnosis of toxocariasis of the performed blood tests and ROC curve calculations, we found out that the only important determinations were SGOT and SGPT, covering an area under the curve of 0.661 and 0.681, respectively, significantly greater than the 0.5 limit surface (tab. I).

Likelihood ratio tests were used to analyze the effect of each independent variable on the system; basically, we checked if each of the performed blood tests had a role in making the diagnosis.

### TABLE I

<table>
<thead>
<tr>
<th>Determination</th>
<th>Surface</th>
<th>Standard error</th>
<th>Signif. asimpt. p</th>
<th>Asymptotic confidence interval 95%</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB</td>
<td>.452</td>
<td>.054</td>
<td>.463</td>
<td>.347</td>
<td>.557</td>
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</tr>
<tr>
<td>HT</td>
<td>.513</td>
<td>.055</td>
<td>.841</td>
<td>.406</td>
<td>.620</td>
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</tr>
<tr>
<td>GA</td>
<td>.534</td>
<td>.062</td>
<td>.601</td>
<td>.414</td>
<td>.655</td>
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<tr>
<td>Eosinophils</td>
<td>.581</td>
<td>.072</td>
<td>.216</td>
<td>.440</td>
<td>.722</td>
<td></td>
</tr>
<tr>
<td>SGOT</td>
<td>.661</td>
<td>.059</td>
<td>.014</td>
<td>.545</td>
<td>.778</td>
<td></td>
</tr>
<tr>
<td>SGPT</td>
<td>.681</td>
<td>.052</td>
<td>.006</td>
<td>.580</td>
<td>.783</td>
<td></td>
</tr>
</tbody>
</table>
Tests with a significance level less than 0.05 have influence on the model – this being the case of SGPT test - which has also been identified as important for determining the presence of Toxocara diagnosis by ROC curve method. Other determinations seem to have no influence on the model.

CONCLUSIONS

The clinical signs and symptoms found statistically significant can be a starting point for making a diagnosis of toxocariasis. Nonspecific laboratory findings are hyperleukocytosis, hyper-eosinophilia, and low hematocrit level, and elevated transaminase levels have high sensitivity and specificity. Accurate diagnosis is established by determining T. canis specific IgG and detection of Toxocara larvae in biopsy tissues.

REFERENCES