

EPIDEMIOLOGICAL AND CLINICO-BIOLOGICAL CORRELATIONS IN THE DIAGNOSIS OF ACHIEVED TOXOPLASMOSIS

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Abstract

A number of 75 patients, males and females, with a medical history suggestive for an infection with toxoplasma gondii, achieved more or less recently, were taken into account. The diagnosis was based on lab investigations (serology through ELISA method, CRP, avidity tests). For the substantiation of the diagnosis, the anamnesis of the patient, personal heredo-collateral medical history, disease history, objective test and paraclinical data in dynamics were taken into account.

80% of the infections with Toxoplasma gondii in the lot under study took place in the case of females, most of them having epidemiological aspects and symptoms specific to the disease.

Most of the cases came from the urban environment – 25 patients (33.3%), the rest of 50 patients (66.6%) come from the rural environment. The characteristic symptom was lymphadenopathy with double location, respectively laterocervical and occipital location at a number of 19 cases and the most frequent hematological modification was represented by leucocytosis with eosinophilia.

Key words: achieved toxoplasmosis, IgM antibodies, igG antibodies, ELISA method

INTRODUCTION

Toxoplasmosis is a parasitic infection caused by a protozoan known as *Toxoplasma gondii* (Kleegman; Connor; Sternberg; Ambrozic). Humans most often become infected with this organism by consuming undercooked meat—especially lamb and pork—or eating unwashed fruits and vegetables (Anfray; Fortier). Raw goat milk has been known to carry the parasite. Animals are not immune to this illness. Cats—domestic and wild—are often carriers. A person who comes in contact with cat feces, such as when changing a litter box, is especially prone to the disease. Other less common causes include blood transfusions and organ transplants (Chiotan; Rebedea).

The three forms of *T. gondii*, the microorganism that causes toxoplasmosis, are: tachyzoites, bradyzoites (Fortier)

A healthy person who becomes infected with this parasite experiences few or no symptoms. An estimated half of Americans and one-third of Canadians carry antibodies from past exposure without being aware. However, people who have a weakened immune system, such as older individuals and AIDS patients, are at risk for severe complications (Sternberg).

Pregnant women who contract toxoplasmosis put their unborn child at great risk. The effect of *T. gondii* on a fetus is severe. Women who become infected in the late months of pregnancy are likely to pass the

parasite to their unborn child through the placenta. If the mother was infected at the time of conception or if the fetus is infected during the first trimester of pregnancy, a miscarriage is likely. Infants born with toxoplasmosis usually have severe eye infections, a swollen liver or spleen, jaundice, or pneumonia. The mortality rate of babies born with toxoplasmosis is high. If the infected baby survives, it is likely that the child will be visually impaired, have fluid in the brain, and suffer from learning disabilities or mental retardation (Kleegman; Montaya) .

OBJECTIVES

Our objective in this paper is the approach of those persons – males or females, but mainly females, that have presented signs and symptoms suggestive for an achieved toxoplasmosis, of those persons that live in an intensely parasite-contaminated environment and of the persons to which the antibodies of positive *antitoxoplasma gondii* have been detected.

Other objective is the highlight of the epidemiological aspect of those contaminations, as well as, the study of the immunocompetent and immune suppressed hosts infected with toxoplasma.

MATERIAL AND METHOD

A number of 75 patients, males and females, with a medical history suggestive for an infection with *toxoplasma gondii*, achieved more or less recently, were taken into account; the patients were sent for exploration by the obstetrics and gynecology services, as well as, by the family planning offices for problems that regards infertility, abortions and premature deliveries. The respective patients came from Bihor county (Romania) and Hajdu-Bihar (Hungary).

The diagnosis was based on lab investigations (serology through ELISA method, CRP, avidity tests). For the substantiation of the diagnosis, the anamnesis of the patient, personal heredo-collateral medical history, disease history, objective test and paraclinical data in dynamics were taken into account.

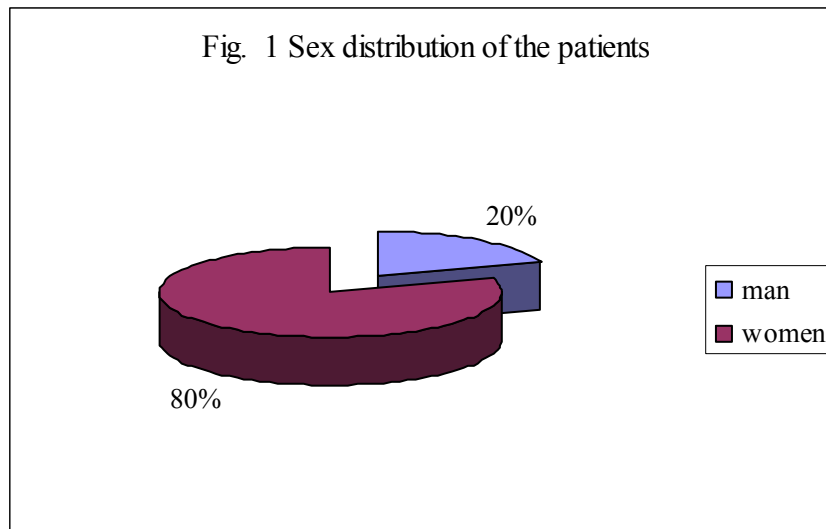
The epidemiological study consisted in the classification of the contaminations by toxoplasma according to: sex, age, origin environment and geographic area

RESULTS AND DISCUSSION

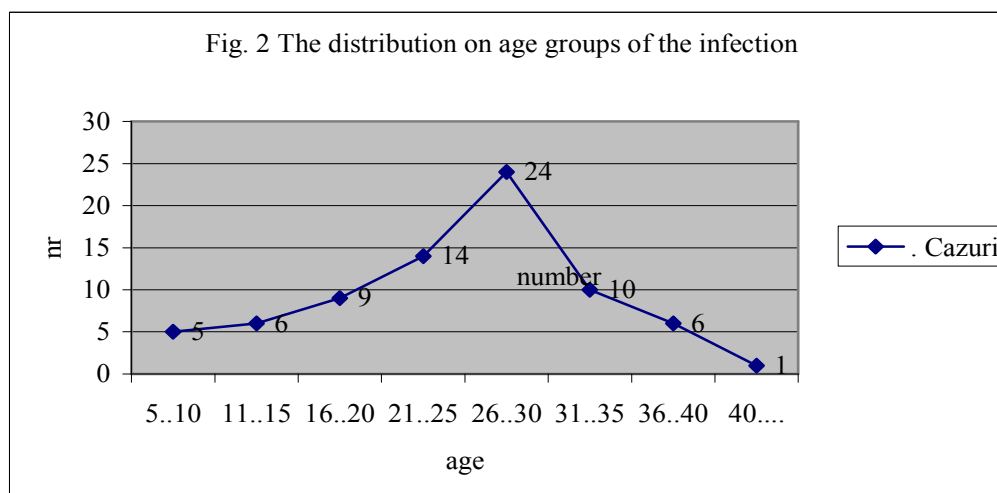
The lot under study doesn't respect the real prevalence in the population of the contaminations with toxoplasma, because the cases that were studied were directed especially by the family doctors or by the

gynecologists preoccupied by the conception of a pregnancy; for this reason, the increasing incidence of cases reported was higher for females.

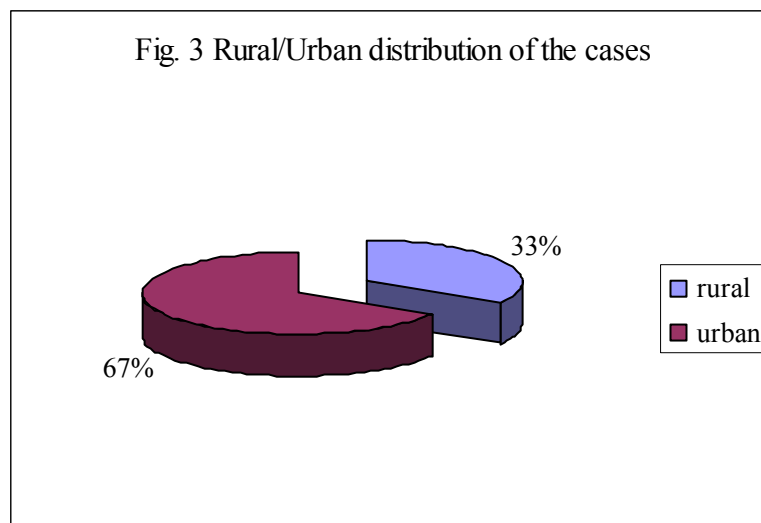
It was noticed that 80% of the cases with infections with *Toxoplasma gondii* happened to persons of feminine sex, most of the cases having epidemiological aspects, as well as, symptoms characteristic to the disease (Figure 1)



The distribution on age groups of the infection with *Toxoplasma gondii* shows the fact that the highest incidence was in the age range of 26-30 years. The range of 21-25 doesn't have to be excluded (Figure 2)



Most of the cases came from the urban environment – 25 patients (33.3%), the rest of 50 patients (66.6%) come from the rural environment. This ratio doesn't correspond to the real incidence of the disease in the population; usually, the rural environment generates more favorable conditions as the parasite to circulate and be transmitted. The increasing incidence of cases reported in the urban area to the medical services led to the results of our study (Figure 3).



● Out of the lot of patients under study, four cases representing 5.33%, some positive IgG *toxoplasma gondii* antibodies and negative IgM *toxoplasma gondii* antibodies were highlighted through ELISA method in the serum of the patients. Following in dynamics the values of these antibodies at about four weeks after the initial evaluation, we noticed that their value didn't increase but it was maintained at the initial values. For these cases, it was reached the conclusion that the respective patients presented an acute infection in antecedents with *toxoplasma gondii*, at present being diagnosed as having chronic toxoplasma.

● A number of 11 patients representing 14.66% out of the lot presented positive IgG *toxoplasma gondii* antibodies and equivocal (slightly increased) IgM *toxoplasma gondii* antibodies. For these patients, the analyses made to determine a possible infection with Epstein Barr virus or with cytomegalovirus were negative. Making the analyses in dynamics at about 2-3 weeks after the initial tests for toxoplasmosis, IgG antibodies slightly increased and IgM antibodies were maintained at the initial value. Probably, it is about a recent seroconversion, the infection with *toxoplasma gondii* being recently achieved.

☉ At a number of 19 patients in the lot, representing 25.33%, we noticed the positivation of IgM antibodies much more than the normal value and the IgG antibodies ranged in normal limits at the first determination. For 5 patients of this lot, we highlighted the presence of positive anti-cytomegalovirus IgG antibodies. For a diagnosis as accurate as possible, these values of the antitoxoplasma gondii antibodies were repeated after two weeks to observe the seroconversion. The five cases with positive IgG antibodies for cytomegalovirus, for a differentiated diagnosis with this disease the determination and DNA of *toxoplasma gondii* was also made through CRP method, from the blood of the patients which gave positive results.

It was also noticed that the value of IgM antibodies slightly decreased excepting the five cases with positive anti-cytomegalovirus IgM to which the value remained unchanged, while that of IgG antibodies increased at an interval of two weeks. These patients were catalogued as having an acute infection with *toxoplasma gondii*.

☉ Other lot of 41 patients was that to which we determined positive IgM and IgG antibodies for *toxoplasma gondii*, representing 54.66 %. Seven of these patients presented also positive IgG antibodies for cytomegalovirus, for which the CRP was necessary to determine the DNA of *toxoplasma gondii* which gave positive results.

The determination of IgM and IgG antibodies after two weeks highlighted a slightly increase of IgG antibodies in comparison with IgM antibodies that were maintained at the initial value, fact that indicates an acute infection with *toxoplasma gondii*.

Within the study of immunocompetent or immuno suppressed cases of toxoplasmosis, we determined the following changes:

Hematologic syndrome:

- 20 patients with leucocytosis and eosinophilia (26.66 %) /
- 15 patients with leucocytosis and lymphomonocitosis (20 %)
- 9 patients with leucocytosis and neutrophilia (12 %)
- 5 patients with leucocytosis, with no other changes (6.66 %)
- 6 patients with leukopenia (8 %)
- 20 patients with no hematological changes (26.66 %)

Inflammatory syndrome

- Well-expressed - 31 patients (41.33 %)
- Moderately increased - 19 patients (25.33 %)
- No changes - 25 patients (33.33 %)

The most frequent symptoms for the lot under study was lymphadenopathy with different locations:

- 19 patients with laterocervical and occipital adenopathy (25.33%)
- 13 patients with laterocervical and submandibular adenopathy (17.33%)
- 14 patients with laterocervical and supraclavicular adenopathy (18.66%)
- 10 patients with laterocervical adenopathy (13.33%)
- 9 patients with occipital adenopathy (12%)
- 6 patients with occipital and supraclavicular adenopathy (8%)
- 4 patients with no adenopathy (5.33%)

The most frequent associated diseases in the case of *toxoplasma gondii* infection were:

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| • diabetes of type 2 | 5 cases, (6,66%) |
| • endocrinological diseases | 4 cases, (5,33%) |
| • neurologic diseases | 4 cases, (5,33%) |
| • HIV/SIDA infection | 1 case, (1,33%) |
| • digestive diseases | 7 cases, (9,33%) |
| • respiratory illnesses | 4 cases, (5,33%) |
| • with no associated diseases | 50 cases, (66,66%) |

CONCLUSIONS

80% of the infections with *Toxoplasma gondii* in the lot under study took place in the case of females, most of them having epidemiological aspects and symptoms specific to the disease.

Most of the cases came from the urban environment – 25 patients (33.3%), the rest of 50 patients (66.6%) come from the rural environment.

The distribution on age classes of the infection with *Toxoplasma gondii* reveals that the highest incidence was in the age range of 26-30 years.

The characteristic symptom was lymphadenopathy with double location, respectively laterocervical and occipital location at a number of 19 cases.

The most frequent hematological modification was represented by leucocytosis with eosinophilia.

According to the national and international bibliography, we chose a modern methodology specific to adequate researches.

The diagnosis was based on the interpretation of lab analysis (serology through ELISA and CRP methods). For the substantiation of the diagnosis, the patient anamnesis, heredo-collateral antecedents, personal antecedents, disease history, objective test and paraclinical data in dynamics have been taken into account.

Having in view the complexity of the problem, the next research will focus on the study of the infections in pregnant women, as well as, on the reduction of the fetus-contamination risk.

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