

# The medical human importances of the toxoplasmic infection acquired during pregnancies

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## Background

Congenital malformations represent an important aspect of medicine due to its deep social and inside family implications. The toxoplasmic infection is one of the major causes of congenital malformations. Toxoplasmosis is a worldwide spread disease, with a frequency, which vary according with the conditions favoring the transmission to humans. The incidence of this disease and its implications are less known in Romania, reason for which we decide to solve these aspects.

## Material and Method

Our study was performed over a group of 253 congenitally malformed children, with suspected toxoplasmic etiology. The studied children belong to different age groups. The majorities were infants (43.8%) or small children (39.7%) and a small percentage (16.5) were under school age and school age children. In 68 (26.9%) of the malformed children the maternal antitoxoplasmic antibodies were evaluated in order to identify the maternal toxoplasmic infection during pregnancy. The infection with *Toxoplasma gondii* was detected by demonstrating the presence of specific antitoxoplasmic antibodies (IgG) by indirect immunofluorescence.

## Results and Discussion

Proves of toxoplasmic infection were found in 28.9% of the malformed children, which demonstrates that 28.9% of congenital malformations are due to toxoplasmic infection acquired during pregnancy. On the other hand, these data shows that 71.5% of the congenital

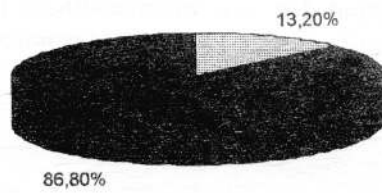
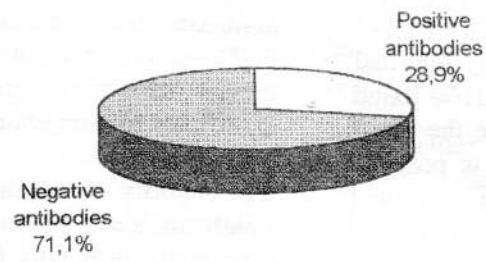
malformations are not the consequence of toxoplasmosis, having other etiology.

Trying to demonstrate the presence of antibodies in 68 pairs of mother-malformed baby, positive results were found in 59 cases (86.8%), which shows that toxoplasmic infection is not transmitted from mother to her fetus in 13.2% cases. The evolution of pregnancy was followed in mothers with malformed children. 57.3% of these pregnant women had a normal pregnancy and 42.7% had pathologic pregnancies: stillbirth, hemorrhage, premature birth, abortion, and others.

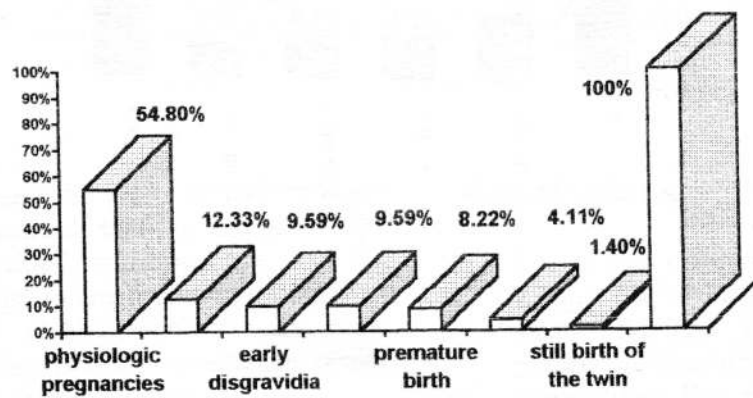
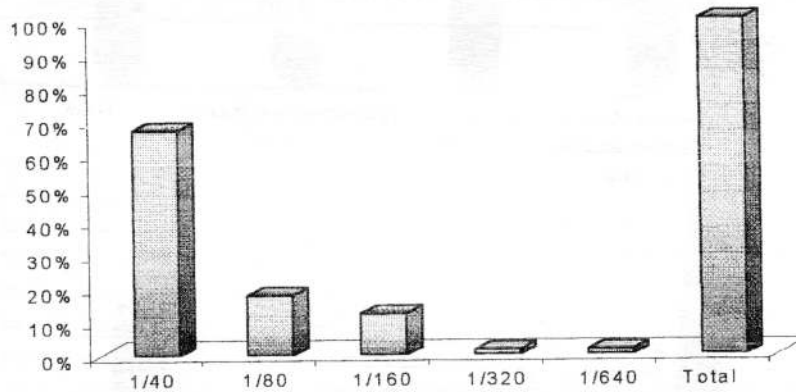
It is very important to emphasize that the evolution of most pregnancies was apparently normal, with no signs of fetal disease.

Following the titer of antibodies in mothers with malformed children we found a titer of 1/40 in 66.2% of them and a titer greater of equal with 1/80 in 33.8% (23 mothers).

The later titer had the following distribution: 8 mothers (11.8%) had a titer of 1/80, 8 mothers (11.8%) a titer of 1/160 and 7 mothers (10.3%) had a titer of 1/320. The interpretation of antibodies presence in mothers is difficult, but our data suggest that congenital malformation are the consequence of an infection acquired in the first months of pregnancy. 77.9% of them were acquired in the first month, when the fetal embriogenesis take place and only 22.1% of mothers had the infection during the last period of pregnancy (11.8 in the second semester and 10.3% in the third semester) when there is a lower risk for congenital malformations.



□ Positive antibodies in mother - negative in child  
 ■ Positive antibodies in mother - positive in child

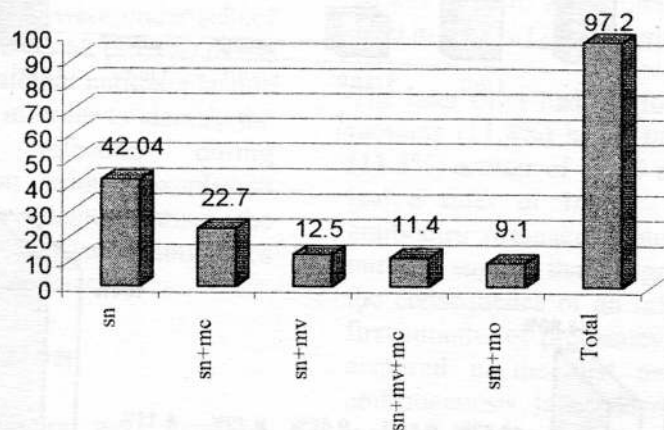
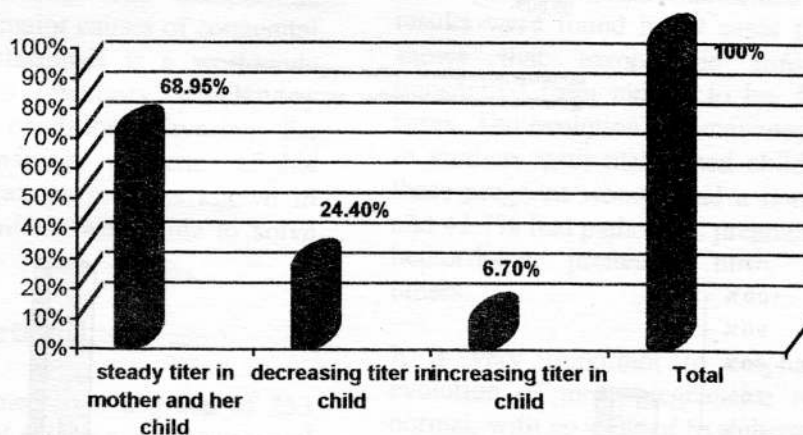


In serum positive malformed children (73 children) the distribution of antibodies titer was as follows: 49 cases (67.1%) had a titer of 1/40, 13 cases (17.8%) had 1/80, 9 cases (12.3%) had 1/160, 1 child (1.3%) had 1/320 and 1 child had 1/640. Antibodies titer greater than 1/160 found in 11 malformed children (15.1%) are the proof of congenital Toxoplasmosis, but it is possible that a greater percentage of studied malformations to be the consequence of congenital Toxoplasmosis.

Following the level of antibodies titer in malformed child and his mother, in the group of 59 mother-malformed child pairs, we found that in 68.97% of malformed children the antibodies

titer was the same as the antibodies titer in their mothers, especially those of low level. This fact suggests that those antibodies may be maternal antibodies that are transmitted transplacental. In 6.7% of children, we found antibodies titer greater than that found in mothers, which is significant for congenital Toxoplasmosis.

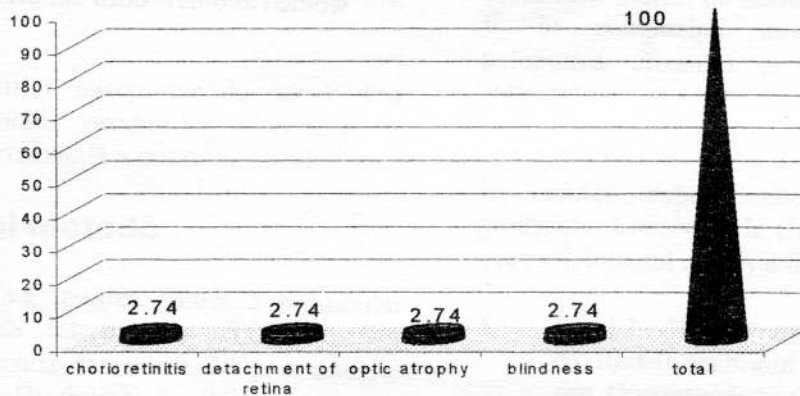
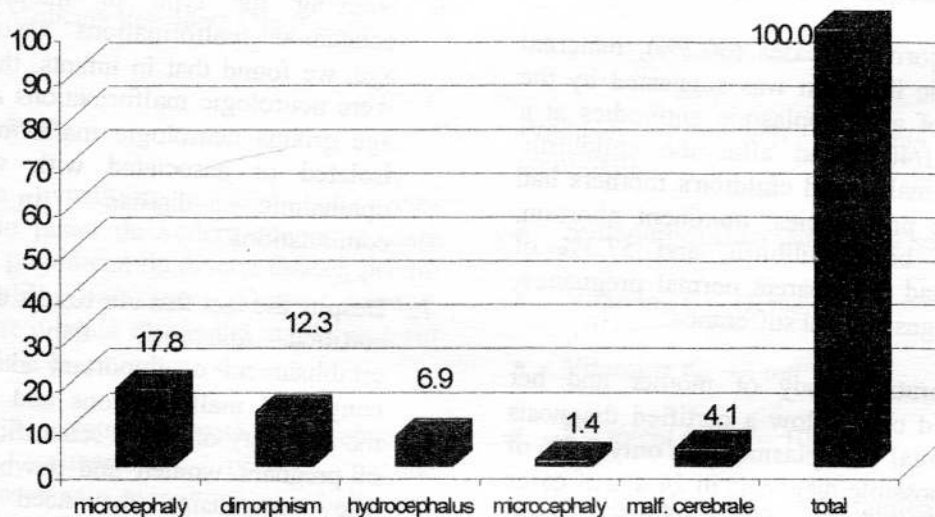
The majority of malformed children (97.6%) had ophthalmologic problems (27.5%) and isolated neurologic problems (42.1%) or in addition to other manifestations: malformations (22.7%), visceral disease (12.5%), malformations and visceral disease (11.4%), ophthalmologic manifestations (9.1%), and a small percentage (1.1) had isolated congenital malformations.



The neurologic manifestations recorded in 97.6% of tested children were especially psycho-motor retardation (71.3%), epileptic seizures (11%), tetraparesis (2.7%), halfparesis (4.2%), cerebellum syndrome (1.4%), cranial nerves paralysis and deafness (7%). As visceral manifestations, we found anemia (24.7%), trombocytopenia (1.4%), jaundice (1.4%), and malformations of the heart (2.7%). The congenital malformations were: microcephaly

(17.8%), cranial-cerebral dimorphism (9.6%), and hydrocephalus (6.9%), cranio-cerebral dimorphism associated with palatoschisis (2.7), microphthalmia (1.4%), cerebella atrophy (1.4%), and frontal-parietal atrophy (1.4%) and cerebral ventricle ectasy (1.4%).

The ocular problems reside in chorioretinitis (19.4%), detachment of retina (2.7%), optic atrophy (2.7%) and blindness (2.7%).



Correlation between the types of malformation and age demonstrate that in neonates the neurologic congenital malformations are the most common, and in small children, preschool and school age children isolated neurologic sequel or associated with visceral or ocular malformation are the most common.

## Conclusions

1. The studied children belong to different age groups. The majority was infants (43.8%) or small children (39.7%) and a small percentage were under school age and school age children. Our result shows that 28.9% of

congenital malformations may be of toxoplasmic etiology, but 71.1% of malformations are supposed to have other etiology.

2. A certified diagnosis of acute toxoplasmic infection in the evolution of pregnancy was established only in 33.8% (22.1%) of malformed children mothers. However the real percentage may be higher due to technical difficulties in diagnosis.
3. In the majority of cases (66.2%), maternal toxoplasmic infection was suggested by the presence of antitoxoplasmic antibodies at a titer of 1/40 found after the childbirth. 42.7% of malformed children's mothers had pathologic pregnancies: imminent abortion, premature birth, stillbirth, and 57.3% of mothers had an apparent normal pregnancy, with no signs of fetal sufferance.
4. A comparative study of mother and her malformed child allow a certified diagnosis of congenital Toxoplasmosis in only 6.7% of cases, a possible diagnosis in 24.4% of cases and an uncertain diagnosis in 68.9% of cases, where the antibodies may be those transmitted transplacental from mother.
5. Maternal toxoplasmic infection may be transmitted to the fetus in 6.7% of cases (but a percentage of 24.4% is also possible) and it is not transmitted from mother to the fetus in 13.2% of cases. Although the maternal infection has a low rate of transmission to fetus, it may be the cause of severe congenital malformations such as neurologic ones leading to retardation and ocular ones leading to blindness.
6. Noticing the type of manifestation of congenital malformations according with age, we found that in infants, the majorities were neurologic malformations and in other age groups neurologic malformations were isolated or associated with visceral and ophthalmic disease in different combinations.
7. Despite the fact that our results do not offer a certified diagnosis they afford the establishment of important ideas regarding congenital malformations and aware about the necessity of active scientific surveillance of pregnant women and newborn children. They emphasize the need of national programs for the control of toxoplasmic infections in which modern techniques of diagnosis of specific IgM antitoxoplasmic antibodies should be used both in pregnant women and new born children.