

CONGENITAL TRICHINELLOSIS? CASE REPORT

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Summary :

A large trichinellosis outbreak in the Slovak Republic caused by the species *Trichinella britovi* and affecting 336 people also affected a pregnant woman. The mother was infected in the 10th week of pregnancy and was treated with mebendazole. On her own request abortion was performed in the 22nd week of pregnancy. Medium IgM and high IgG anti-*Trichinella* antibody titres were found. The placenta, body cavities liquid, tissues and organs of the foetus contained 0.02 – 30 larvae per gram of tissue, measuring 0.68 ± 0.05 – 1.17 ± 0.07 mm, with blurred inner structure. Immunocytochemical examination identified *Trichinella* larvae that infected the foetus in the early stage of development.

KEY WORDS : trichinellosis, *Trichinella britovi*, foetus, intrauterine transmission.

The foetus is protected against noxious substances and infectious agents by the placenta. Nevertheless, with viraemia, bacteraemia and parasitaemia in mother, infection is also transmitted to foetus (Carrier & Truyens, 1995). In some parasites, e.g. *Toxocara canis* the intrauterine transmission is a part of their life cycle. Kuitunen-Ekbaum (1941) reported the finding of *Trichinella spiralis* larvae in a 7-month-old human foetus, concluding that they penetrated from infected mother. The intrauterine migration of *Trichinella* larvae has been detected in several species of experimental by infected animals (Roth, 1935, 1936; Podhájecký & Tomašovičová, 1969; Webster, 2000, personal communication). *Trichinella*-infected mothers were in high risk of abortion or foetal death during pregnancy (Klein, 1978; Kociecka, 1996). An outbreak caused by the species *Trichinella britovi* occurred in Slovak Republic in 1998 (Dubinsky *et al.*, 1998), affecting also pregnant woman. We present here the course of pregnancy of the 23-year-old primigravida with acute *Trichinella* infection.

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MATERIALS AND METHODS

The patient was infected in her 10th week of pregnancy. She was admitted to the hospital in her 18th week of pregnancy. The patient was treated on days 56 after infection for ten days with mebendazole (1.5 g/day) and for three days with prednisone (60 mg/day). In the 20th week of pregnancy blood and amniotic fluid samples were taken. In the 22nd week abortion was induced by prostaglandins. The male foetus, weighing 480 g, was frozen and transported for an autopsy.

Mother's blood samples were examined by standard laboratory methods. Serum and amniotic fluid were examined for the presence of anti-*Trichinella* IgA, IgM and IgG antibodies by ELISA using antigen from *T. spiralis* larvae (Havasiová & Dubinsky, 1994). Autopsy of the foetus was performed in standard way with some modifications of a neonate autopsy.

The liquid content of the thoracic and abdominal cavities was diluted 1:10 with saline and sedimented. *Trichinella* larvae were isolated from placenta, organ and muscle samples by digestion method. All larvae or their cuticles were counted and calculated for 1 g of sample (LPG). The length of larvae or their cuticles was measured. Tissue samples were fixed in 4 % formaldehyde, processed by a routine paraffine technique and stained with haematoxylin and eosin. Some special stains and PAS for identification of larvae were performed. Cuticles of larvae obtained by the lavage of the foetal cavities were fixed and processed using indirect immunofluorescence technique according to Coons *et al.* (1955).

RESULTS

The patient was admitted to the hospital because of positive epidemiological history in the 18th week of pregnancy. She showed moderate increase of temperature, muscle ache, mild joint swelling and 4 % eosinophilia. Symptoms disappeared after treatment. Trichinellosis was confirmed serologically.

Medium IgM (1:800) and high IgG (1:1600) anti-*Trichinella* antibody titres were detected. In the 20th week of pregnancy, the mother's amniotic fluid showed the presence of specific IgG antibodies 1:1600. In week 22, both IgM and IgG specific antibodies were elevated. The blood tests were normal and mild eosinophilia persisted. The pregnancy was taking a normal course until the induced abortion, which was preferred by the mother.

In several organs of foetus, including the striated skeletal muscles, manifestations of conspicuous effusion, extravasation and focally signs of haemorrhages were observed. Apparent focal haemorrhages were found in the pericardium, retroperitoneal connective tissue, particularly in periaortal region and in the connective tissue of the pelvis. The histological examination disclosed signs of immaturity of organs and other tissue relative to the length of gestation. Several organs showed signs of marked oedema of the connective tissue. Skeletal muscles showed the presence of conspicuous oedematous effusion of endo- and perimysium and in some places optically empty spaces of elongated or round shape were observed, without histological changes in the surrounding area. Despite the extensively performed serial sections of numerous samples, parasites were not found.

Examination of the placenta, liquid content of body cavities, organs and tissues revealed the presence of larvae or their parts. Most of the larvae had no inner structure and only their cuticles were found. No larvae were observed in the kidneys (Table I). Only very few larvae were found in the placenta. The thoracic exudate contained as many as 7 LPG. The size of larval cuticles varied from 0.68 ± 0.05 mm in the *M. pecto-*

ralis major to 1.17 ± 0.07 mm in the diaphragm. Sporadically 0.04 mm long larvae were also observed.

The isolated larval cuticles were not coiled but mostly straight or moderately bent. Immunocytochemical technique using hyperimmune serum against *T. spiralis* somatic antigens intensively stained the tegument of larvae.

DISCUSSION

Human trichinellosis is rare in the Slovak Republic. Over the years 1988-1997 only 75 positive cases were serologically detected. Particularly large epidemic in 1998 recorded 336 infected humans. From the total number of 336 infected patients, 45 were women, two of them pregnant. The first pregnant woman, aged 33, was probably infected in 16th week of pregnancy. She miscarried after four weeks of infection. Very similar pattern of trichinellosis was also observed in a 23-year-old pregnant woman, as indicated by examination results. With respect to acute course of trichinellosis in mothers, presumed infection of the foetus and teratogenic effect of antiparasitic drugs, the abortion was suggested.

The hypothesis about the ability of *Trichinella* to penetrate the placenta and to damage a foetus is based largely on postmortem examinations of 48 newborns, showing the presence of *Trichinella* in four cases (Hood & Olson, 1939). Bourns (1952) reported 22 *Trichinella* cysts from a six-week old neonate.

Our findings suggest that larvae penetrated into foetus continued to grow also in the foetus, however, no encapsulated larvae were observed. We are unable to explain why these larvae were not notable on histological examination of tissues, although their presence was confirmed by the digestion method. In most isolated larvae only their cuticles were found. Their *Trichinella* origin was confirmed by immunocytochemical examination. Only some of the larvae had a partially preserved inner structure. In our case, the treatment of mother killed larvae and most likely contributed to the change in the morphological structure and to the disintegration of the inner structure of unprotected larvae. It has been experimentally proved that treatment and subsequent freezing also changes or removes the inner structure of larvae.

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| | Larvae per gram of tissue (LPG) | Mean larvae length in mm \pm S.D. |
|----------------------------------|---------------------------------|-------------------------------------|
| Placenta | 0.02 | 0.90 ± 0.08 |
| <i>M. temporalis</i> | 30.0 | 0.97 ± 0.11 |
| <i>Mm. masseteri</i> | 10.0 | 0.84 ± 0.14 |
| <i>M. sternocleidomastoideus</i> | 6.0 | 0.93 ± 0.08 |
| Tongue | 14.0 | 0.90 ± 0.18 |
| Diaphragm | 3.3 | 1.17 ± 0.07 |
| <i>M. intercostales</i> | 2.8 | 0.68 ± 0.05 |
| <i>M. quadriceps femoris</i> | 0.6 | 0.85 ± 0.09 |
| Abdominal exudate | 5.8 | 1.02 ± 0.14 |
| Liver | 1.7 | 0.78 ± 0.09 |
| Pancreas | 26.7 | 1.12 ± 0.15 |
| Kidney | 0 | – |
| Testes | 6.7 | 1.13 ± 0.03 |
| Thoracic exudate | 7.0 | 0.79 ± 0.13 |
| Lungs | 1.7 | 0.89 ± 0.27 |
| Heart | 8.2 | 0.98 ± 0.18 |
| Brain | 0.5 | 1.09 ± 0.21 |
| Thymus | 10.0 | 0.87 ± 0.02 |

Table I. – Finding of *Trichinella* larvae in placenta and foetus.

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