

OUTBREAK OF IMPORTED TRICHINELLOSIS IN VERONA, ITALY, JANUARY 2008

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We describe an outbreak of trichinellosis in Verona, Italy, in early 2008 that was imported from Romania.

Trichinellosis is a cosmopolitan zoonotic disease caused by a nematode of the genus *Trichinella*. The main source of human infection is consumption of raw or undercooked meat (especially from pig, wild boar and horse).

The symptoms vary with the amount of viable larvae ingested, from asymptomatic to severe trichinellosis. The first symptoms are enteric (nausea, vomiting, diarrhoea and abdominal cramps) and occur within a few days. After eight to 15 days (range, five to 45 days), the larvae invade the muscles causing systemic symptoms (muscular pain, fever and eosinophilia). Conjunctival haemorrhages and periorbital oedema may be present. In this 'invasion stage', neurological involvement and myocarditis may appear [1,2].

Outbreak description

In January 2008, a Romanian family living in Italy (two adults and one child) and a friend of the family were admitted, respectively, to the Centre for Tropical Diseases of Sacro Cuore Hospital of Negrar and to the Department of Infectious Diseases of the University Hospital G.B. Rossi, both in Verona. During a visit to relatives and friends in Romania, they had all consumed ham produced from a pig slaughtered without any veterinary control. Two more people in Romania developed trichinellosis from the same source, as recorded through an epidemiological survey by the local health unit that received our notification. We are not aware of any laboratory testing on the implicated food in Romania.

Patient 1

The index case was a nine-year-old child, who was admitted with fever (37.5 °C), myalgia and fatigue 14 days after eating the ham. One week earlier, the patient had had a transient fever with diarrhoea and vomiting, and gastroenteritis was suspected.

The laboratory findings on admission showed mild eosinophilia (550/μL, normal value <450/μL). Muscular and heart enzymes were normal. Stool culture was negative and so was the stool examination for parasites. Serological tests for *Toxocara* and *Strongyloides* were also negative. Considering the anamnestic data and the persisting fever with eosinophilia and myalgias, trichinellosis was suspected. Serology (ELISA test performed at the Istituto Superiore di Sanità, Rome) confirmed the diagnosis. The patient was treated with albendazole and prednisolone, and her condition improved rapidly.

Patient 2

Three days after the first patient, the child's father was also admitted to the hospital with fever (37.6 °C) and myalgia. One week earlier, he had also experienced diarrhoea and vomiting. Laboratory tests on admission showed increased eosinophil count (1,070/μL, or 10%) and creatine kinase (4,086 U/L, normal value <397 U/L) and troponin (0.89 ng/L, normal value <0.06 mcg/L) level. The electrocardiogram (ECG) and the echocardiography were normal. *Trichinella* antibodies were detected in the serum. He was treated with albendazole and prednisolone.

A relapse of symptoms, with further increasing creatine kinase and troponin levels and eosinophil count (the latter up to 6,870/μL, or 41%), occurred at the end of treatment and required a second, short course of steroid.

Patient 3

On the same day as patient 2, a friend of the family in their 40s was admitted to hospital for fever (38 °C), myalgia, periorbital oedema and conjunctival haemorrhages. Again, a transient fever with abdominal pain and diarrhoea had appeared one week before presentation. The laboratory showed creatine kinase values of 572 U/L, creatine kinase-MB of 13.2 μg/L (normal value, <6 μg/L), myoglobin 300 μg/L (normal value, 28-72 μg/L), and troponin 0.07 ng/L. Surprisingly, the eosinophil count was normal on admission, but subsequently increased and peaked at 4,140/μL (or 39%).

The ECG showed anterior fascicular left block, and a concentric left ventricular hypertrophy was observed by echocardiography.

The patient was treated with albendazole and prednisolone. During the second week, we observed a relapse of fever and myalgias along with further increasing levels of eosinophil count (4,200/μL or 39%), troponin (0.37 ng/L), creatine kinase-MB (32 μg/L) and myoglobin (1,044 μg/L). ECG and echocardiography were unchanged.

After one month, the laboratory findings indicative of myocarditis returned to normal.

Patient 4

The mother of patient 1 was admitted to hospital nine days after patient 1. Five days earlier, when she was still asymptomatic, screening blood tests had been performed on her. Eosinophil count, C-reactive protein and creatine kinase were normal, but serology for *Trichinella* was positive (no previous history of trichinellosis was reported).

On admission, after 24 days of incubation, she was afebrile, with headache, myalgia, arthralgia and periorbital oedema. She had consumed a smaller amount of the ham than the others. The laboratory showed increased eosinophil count and normal muscular and heart enzyme levels. The patient was successfully treated as above.

Discussion

To our knowledge, this is the first reported outbreak of trichinellosis in the Romanian community living in Italy. Based on Ministry of Health official data, 44 cases were recorded in Italy from 2000 to 2005 (between two and 21 cases per year) [3]. In 2002, two cases were classified as "imported" from Croatia.

According to the International Commission on Trichinellosis survey (2004), Romania is the country reporting most cases of trichinella infection in the world [4]. The Romanian community in Italy (556,000 people) accounts for 15.1% of all immigrants. Most come from the rural Moldavian region, one of the poorest regions in Romania [5].

Romania's joining of the European Union (EU) clearly caused increased people movement and trade traffic. Current European regulations aim at ensuring that only meat that has been certified trichinella-free after systematic control may be marketed [6].

Trichinellosis is uncommon in Italy and seldom suspected in occasional or epidemic cases. Nevertheless, the disease should be suspected in every patient coming from a highly endemic region and/or with a history of raw meat (or raw meat products) consumption and presenting the unusual association of fever, myalgias and eosinophilia. We recommend considering as potentially infected all homemade uncontrolled meat products coming from countries endemic for trichinellosis.

We also underline the myocardial involvement (albeit sub-clinical) in three of our four patients. Myocarditis, a potentially life-threatening complication, occurs in 5-20% of trichinellosis cases, particularly in the first two weeks after exposure [7]. Although the overall death rate for trichinellosis is low (five in 6,500 cases in the last 25 years in the EU), the possibility of myocardial involvement should be considered [8].

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