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Trichinellosis outbreak in Bavaria caused by cured sausage from Romania, January 2007

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Most trichinellosis cases notified in Germany are related to so-called imported diseases [1]. In mid-January 2007, three family members from Bavaria came down with typical symptoms for trichinellosis after visiting relatives in Romania (Arad district) during the Christmas holidays.

An interview with the patients revealed that on 23 December 2006, the Romanian family and their guests had consumed home-made products from a home-slaughtered pig in the form of minced meat, cured sausage and bacon, and that a part of those products had not been thoroughly heated. Everyone that had eaten the pork products had developed symptoms of diarrhoea and vomiting between one and three days after consumption. However, these gastro-intestinal symptoms are not characteristic for trichinellosis at the beginning of infection.

When returning to Germany on 4 January 2007, the visitors brought back some cured paprika sausage and bacon from the home-slaughtered pig for their own consumption. They started to suffer from muscle pain and oedema in the eyelids and legs 10 to 14 days after consumption of the meat on 23 December.

Their condition worsened, and all three patients (one woman, 25 years, and two men, 29 and 47 years) were hospitalised in early February 2007. Trichichinellosis was suspected on the basis of the anamnesis and the clinical findings. The laboratory results confirmed myositis and myocarditis. Blood samples of the three patients were sent to the Bernhard-Nocht-Institute in Hamburg and confirmed as *Trichinella*-positive. A follow-up examination of two serum samples from each patient taken three weeks later was performed by the National Reference Laboratory for Trichinellosis at the Federal Institute for Risk Assessment in Berlin. In all three cases, ELISA results showed high titers of anti-*Trichinella*-IgG antibodies (first sampling: 1:160 to > 1:1,280; second sampling: 1:320 to > 1:1,280) and anti-*Trichinella*-IgM antibodies (first sampling: 1:320 to > 1:1,280; second sampling: 1:620 bis > 1:1,280). The patients were treated against muscle nematodes with albendazole (800 mg per day in two doses) for 14 days and anti-inflammatory treatment was performed with glucocorticosteroids and diclofenac. During ambulant follow-up examination, clinical and laboratory results improved, and four weeks after hospitalisation, the patients were almost symptom-free.

Based on interviews with the hospitalised patients, the local veterinary office launched an investigation into possible sources of the infection. Suspected food from the Bavarian household was confiscated and examined at the state laboratory in Erlangen. The sausage and bacon confiscated in the German household were confirmed as *Trichinella*-positive on 19 February. On 22 February, an alert notification was sent by the German authority to the European Commission. No information regarding related cases in the Romanian family is available at this stage.

The National Reference Laboratory for Trichinellosis in Berlin conducted further examinations to quantify and identify the *Trichinella* larvae. The larval density in the cured paprika sausage and streaky bacon was calculated using artificial digestion (magnetic stirrer method) as 441 and 0.5 larvae per gram, respectively. The isolated larvae were identified as *Trichinella spiralis* by Multiplex-PCR.

Comment

This outbreak highlights the importance of imported foodborne cases from countries in which *Trichinella* is present in domestic and sylvatic animals and where trichinellosis is a public health concern. The imported cases reported here were acquired in Romania, where trichinellosis incidence is very high, with 51 cases per 100,000 inhabitants [2]. The early diagnosis of trichinellosis is crucial for efficient treatment. Clinical signs such as diarrhoea and vomiting, which occur in the early enteral stage of infection, are rather unspecific, whereas myalgia, fever and oedema as result of the later parenteral stage are more characteristic [3]. This could also be observed in the three patients described here. Based on the anamnesis, together with clinical signs and the laboratory diagnosis of specific *Trichinella* antibodies in the patients' blood, a causal and symptomatic therapy against trichinellosis was started immediately and the patients recovered after four weeks. Due to the close connection between the first appearance of clinical signs and the stay in Romania, the source of infection could be identified and the suspected pork products were confiscated by the local authority. Finally, foodborne infection was proved by detection of *Trichinella spiralis* with a high larval density, indicating that meat inspection for this parasite had not been performed after slaughtering the pig.

The following aspects should be considered in regard to imported trichinellosis cases:

- In regions where trichinellosis is still endemic, travellers should refrain from consuming raw, cured or insufficiently treated meat or products from animals (e.g. pigs, wild boars, horses) that may be a host for this parasite.
- Raw meat or products such as cured sausage should not be imported.
- If pork is frozen at -20°C for over four weeks, *Trichinella* muscle larvae will be inactivated. A better option is to cook at a minimum of 65°C for one minute, ensuring that the colour changes from pink to grey throughout the meat. Curing and smoking are not considered reliable methods of inactivation of *Trichinella* larvae [4, 5].
- In case of clinical signs such as myalgia, fever and oedema, affected patients should immediately contact a physician and, if trichinellosis is diagnosed, start treatment as soon as possible.

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