Outbreak report

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# Outbreak of trichinellosis in Cáceres, Spain, December 2001–February 2002



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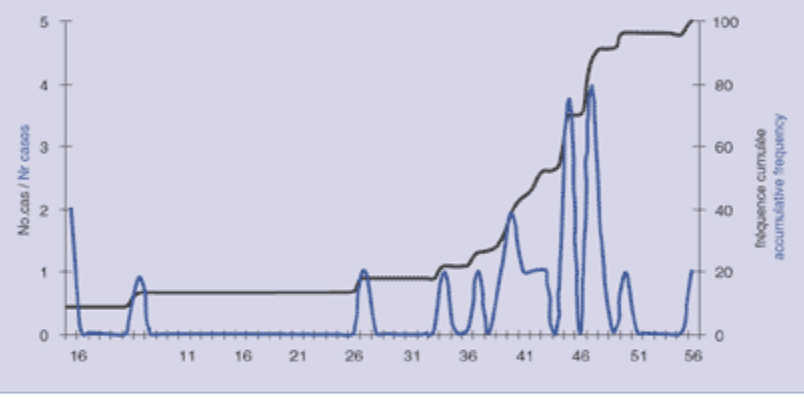
**An outbreak of trichinellosis by *T. britovi* occured in Cáceres, Spain, between 18 December 2001 and 11 February 2002, following the consumption of insufficiently cooked meat from a domestic pig. Among the 56 people exposed, 26 cases of trichinellosis were diagnosed, of which 17 serologically confirmed. The mean incubation period was 23.5 days (3–45). Among the foodstuffs suspected, salami-type sausages were associated with an attack rate of 93.3% (14/15), and a dose-response relationship was observed. Trichinella britovi is essentially a sylvatic species, but this study suggests a change in the epidemiology of trichinellosis.**

Trichinellosis is a notifiable zoonosis, which causes two to three outbreaks per year in Spain. In 1995, the National Network of Epidemiological Surveillance (NNES) developed a standard protocol to detect every single case of trichinellosis, and notify the health authorities as quickly as possible when an outbreak occurs. Most outbreaks are caused by Trichinella spiralis. Trichinella britovi has previously been associated with outbreaks due to the consumption of boar meat, and meat from other wild animals. This paper describes an outbreak of trichinellosis due to T. britovi, resulting from the consumption of meat from a single pig slaughtered in a farm in Cáceres.

On 1 February 2002, the Service of Internal Medicine at the Hospital Campo de Arañuelo, in Navalmoral de la Mata, notified a suspected case of trichinellosis to the local public health authorities in Cáceres. During the following days, six more cases were notified (figure 1). All the infected individuals reported having consumed meat from a single pig which was slaughtered in a farm located in a village of the province of Cáceres, on 15 December 2001. On that day, meat from the pig was eaten cooked; but a week later until 1 February 2002, the meat was consumed as sausages (preferably raw). This pork was consumed by members of a single family, and was not distributed to the general public.

**Figure 1**

Courbe épidémique et fréquence cumulée (épidémie de trichinellose à Cáceres, 18 décembre 2001–11 février 2002)
Epidemic curve and accumulative frequency (Outbreak of trichinellosis in Cáceres, 18 December 2001–11 February 2002)




An epidemiological investigation was initiated in accordance with the NNES' protocol for trichinellosis. A retrospective cohort study was conducted among the people exposed to the consumption of canned products derived from this pork, to assess the importance of the outbreak, and identify the source and food vehicle.

**Methods**

The outbreak study was undertaken with the following criteria:

• Population included in the cohort: all people having consumed the suspected meat between 15 December 2001 and 1 February 2002.

• Exposure to risk: consumption of pork and pork products from the suspected pig: lean meat, highly seasoned pork sausage, and salami-type sausage.

• Suspected case: a person belonging to the defined cohort, and presenting symptoms compatible with the clinical definition used in the NNES protocol for trichinellosis.‰

• Confirmed case: a person belonging to the defined cohort with clinical symptoms and confirmation of trichinellosis by serology.

• Incubation period: delay between the first consumption of the suspected food and the appearance of the first symptoms.

For each type of food, the presence of a dose-response gradient was evaluated, using three categories:

1. No exposure: no consumption of the suspected meat.

2. Moderate exposure: a total consumption of 100 grams or less of the implicated food.

3. High exposure: a total consumption of more than 100 grams of the implicated food.

All the exposed persons were examined by a physician, and had blood taken for trichinella serology.

**Results**

The outbreak lasted 56 days, from 18 December 2001 (three days after the first consumption) to 11 February 2002. Fifty six people were exposed, and 26 cases of trichinellosis were detected, 17 of which were serologically confirmed. Eighteen (69%) of the cases were men. The mean age was 42.7 years (range 2–86), with a standard deviation of 22.1. The most frequently observed symptoms were muscle pain (80.8%), fever (69.2%), diarrhoea (65.3%), oedema (38.4%) and rash (23.1%); two cases were asymptomatic. The mean incubation period was 23.5 days (range 3-45), with a median of 25 days. Relative risk and attack rates for the implicated foodstuffs were calculated, and are presented in table 1. A dose-response relationship was observed for salami-type sausage ($p<0.001$) and highly seasoned pork sausage ($p= 0.004$) (see table 2).

### Tableau 1 / Table 1. Risques relatifs et taux d'attaque des aliments impliqués/ Relative risks and attack rates for the implicated foodstuffs

| Produits carnés Meat products | Taux d'attaque Attack rate (%) | Risque relatif Relative Risk | IC 95% / CI 95% |
|---|---|---|---|
| Saucisse de type salami / Salami-type sausage | 14/15 (93.3) | 3.2 | 1.9–5.2 |
| Saucisse fortement épicée / Highly-seasoned pork sausage | 23/47 (48.9) | 1.5 | 0.6–3.9 |
| Viande maigre / lean meat | 11/21 (52.4) | 1.2 | 0.7–2.1 |

### Tableau 2 / Table 2. Effet dose-réponse des aliments impliqués / Dose-response relationship for the implicated foodstuffs

| Produits carnés / Meat products | Tendance $c^2$ / $c^2$ trend | Valeur P / P value |
|---|---|---|
| Saucisse de type salami Salami-type sausage | 17.2 | <0.001 |
| Saucisse fortement épicée Highly-seasoned pork sausage | 8.5 | 0.004 |
| Viande maigre / lean meat | 0.1 | 0.832 |

From samples of pork, parasitological laboratories at the National Centre for Microbiology, and the University of Santiago de Compostela, identified Trichinella britovi as the pathogen responsible for the outbreak. The antigens were determined by Western-blot analysis using monoclonal antibodies US5 and US9.

The study showed that the animal associated with this outbreak was the pig slaughtered at the farm. People eating salami-type sausage were at highest risk (RR=3.2). All the meat products from the contaminated animal were seized and destroyed. Health education messages addressed to consumers emphasised the importance of ensuring adequate sanitary guarantees in meat for consumption.

**Conclusion**

The results of our investigation indicate that this outbreak of trichinellosis was caused by Trichinella britovi, and transmitted through the consumption of meat from a domestic pig. No further reports of similar outbreaks could be identified in Spain or in the literature. These findings differ from previous assumptions that this pathogen is confined to wild animals, and indicate a possible change in the epidemiological pattern of trichinellosis.