A WATERBORNE TULAREMIA OUTBREAK


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A waterborne tularemia outbreak is described. Forty nine cases were identified in Sansepolcro, a small Medioeval town in the province of Arezzo, Tuscany, Italy. All cases had laterocervical or sub-mandibular adenitis, and occurred within a period of three weeks during March and April 1982.

The study showed association between cases and the consumption of water from an unchlorinated water system. Francisella tularensis type 1 was isolated from wild hares captured in the area.

INTRODUCTION

Tularemia is a disease that is virtually unknown in Italy: only two cases have been reported since 1962.

However, Italy imports many live hares for hunting and up to one million were imported in 1982 from several countries, including some in which tularemia is present. Wild rodents have been shown by several studies to be susceptible to tularemia infection (1-2) and waterborne transmission of the infection (3) as well as the transmission from animal carcasses (4) have been described.

Water contamination by infected animals has been reported in other outbreaks (3, 5); the present paper describes the first tularemia outbreak to be studied in Italy.

At the end of May 1982 the health authorities from the Tuscany region notified the National Epidemiology Unit that several cases of strange and complicated adenopathy were notified to a Local Health Authority by the local hospitals during the previous two weeks.

Serological test for tularemia were positive in many of these cases.

METHODS

An active search for similar cases was undertaken. A case was defined as a patient with clinical evidence of severe lymphadenopathy and a four-fold rise in F. tularensis antibody titer in a paired serum sample, or a single sample titer greater than 1:640 (6).

Subjects were interviewed using a standard questionnaire and information on the water systems supplying the area were obtained from the local water authority.

The questionnaire included information on exposure to wild animals, to domestic animals and consumption of their meat during the weeks before symptoms appeared; exposure to well water was also investigated.

In the month of June, 150 adult individuals referring to the local health service for routine clinical investigations were screened for antibodies against F. tularensis.

Twenty samples from the incriminated water system were cultured for F. tularensis on Hb-Cys-Agar (7).
RESULTS

Forty nine cases of tularemia were identified, all of which occurred within the months of March and April in residents in the Sansepolcro town area.

Figure 1 shows cases by date of onset of symptoms.

None of the 150 adults screened for antibody against *F. tularensis* gave significant positive results.

Sansepolcro is a town of 15,000 inhabitants 11,000 of whom live in the urban Medieeval centre and the remaining 4,000 live in the surrounding countryside.

The countryside is a mixture of hills with crop fields and bush. The local sport is hare hunting and live hares are regularly imported and released in the area for this purpose. The age and sex distribution is given in Table 1. The sex ratio M/F was 1:1.2.

*Clinical findings.* - All 49 cases had lymphoglandular clinical type of the disease. All had laterocervical or submandibular lymph node involvement with fever; no other type of lymphoglandular disease was found in this epidemic and no ulceroglandular or pulmonary type clinical syndrome was found.

Table 2 shows the main symptom frequencies.

Lymph nodes were evidently enlarged, ranging from a nut to an orange size, and 67% developed purulent abscesses.

All cases recovered completely within two to five months from the date of onset.

As treatment was given before the diagnosis was known most cases received antimicrobials other than the ones of choice, and also all attempts to isolate *F. tularensis* from patients were unsuccessful, as there was no positive result in the attempts to isolate the organism from water.

*Source of infection.* - Figure 2 shows the distribution of cases on an area map on which the water pipe system has been drawn.

The town of Sansepolcro is served by two different water systems. System A covers the 74% of area population, it is a modern system well maintained and with active automated chlorination. It is supplied by a large water source that guarantees a continuous and sufficient flow.

The left part of the area is served by system B, an ancient private water system that covers small villages and, until recently did not supply Sansepolcro town.

This system is in a poor state of repair and has no chlorination system at all. For this reason it is preferred by those people who like «natural spring water».

![Figure 1. Tularemia epidemic curve by date of onset.](image1)

![Figure 2. Geographical distribution of cases in Sansepolcro.](image2)

Legend
Dotted lines circumstances areas with capital letters (A, B, C, D, E, F, G, H, I): different geographical areas with the municipalities.
Continuous lines with circuled letters a and b: different geographical areas with the municipalities.
Continuous lines with circuled letters c and e: tanks of the two water systems connected by pipe 1.