

Outbreak of Legionnaires' Disease in the Northern Portuguese Coast During the COVID-19 Pandemic

Surto de Doença dos Legionários na Costa Norte de Portugal Durante a Pandemia da COVID-19

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Palavras-chave: COVID-19; Doença dos Legionários; Legionella pneumophila; Portugal; Surtos de Doenças

On the 3rd of November 2020, eight confirmed cases of Legionnaires' disease were admitted to Hospital Pedro Hispano, in Matosinhos. On the same day, the epidemiological investigation started, even though COVID-19 cases were spiking.

The case definition included both the criteria for confirmed case of Legionnaires' disease¹ and also the following epidemiological criteria: symptom onset after October 15th, and living, working or travelling frequently between Matosinhos and Vila do Conde since September 24th.

The number of cases and the geographical distribution suggested a common outdoor airborne exposure,² probably located between Matosinhos and Vila do Conde. Moreover, most cases rarely left their residence - not only because of the weather conditions and their decreased mobility, but also because of the fear of becoming infected with SARS-CoV-2. Between November 6th and November 17th, over eight different sources were inspected, and water samples collected. The municipal water management company (INDAQUA) was asked to carry out testing in the streets

with the highest number of cases, as well as in water deposits. Meteorological data was received from Instituto Português do Mar e Atmosfera (IPMA).

Three companies had cooling towers that tested positive for *Legionella spp.*, and one that tested positive for *Legionella pneumophila*, using the polymerase chain reaction (PCR) test. Twenty culture samples from patients grew *Legionella pneumophila*. The two sources that tested positive in the PCR test for *Legionella spp.* and *Legionella pneumophila* were ordered to close by the local health authorities (on November 12th). Summary statistics can be found in Table 1.

The outbreak had its peak on November 7th and was considered controlled by November 20th. Considering the incubation period of the disease and the date of closure of the probable source, cases associated with the outbreak could surge until the 3rd of December.

It took less than ten days from the detection of the outbreak to closure of the cooling tower that was likely to be responsible. The coordinated public health response helped preventing ongoing exposure and mitigated associated mortality and morbidity.

This investigation is the first description of a Legionnaires' disease outbreak during the COVID-19 pandemic. There were many challenges: the healthcare system was overburdened, with scarce resources and healthcare professionals strained, making the response slower. The clinical presentation of Legionnaires' disease overlaps with the clinical presentation of COVID-19, which can lead to a late diagnosis.

Table 1 – Summary description of the key characteristics of the confirmed cases (n = 81)

| Variable | Absolute frequency (categorical) or median (continuous) | Relative frequency (categorical) or interquartile range (continuous) |
|---|---|--|
| Sex (male) | 54 | 66.7% |
| Age (years) | 74 | 65 – 85 |
| Case fatality rate | 13 | 16.1% |
| Time between symptoms and confirmation (days) | 4 | 3 – 6 |
| COVID-19 coinfection | 10 | 12.3% |

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