

3 RESPIRATORY DISEASES

a Three travel-associated Legionnaires' disease (TALD) cases associated with a hotel in Cape Town

Legionnaires' disease (LD) is a notifiable condition in South Africa. It is caused by infection by Gram-negative bacteria in the *Legionella* genus. *Legionella* spp. are ubiquitous and are found in the environment and natural water sources. They thrive at environmental temperatures between 20-50°C. Legionnaires' disease is predominantly associated with water systems in the built environment. These include hot and cold piped water systems in large buildings, cooling towers, decorative fountains and respiratory therapy equipment. Colonisation of these water systems by *Legionella* species results in the creation of aerosolised droplets containing *Legionella* bacteria. Legionnaires' disease is acquired when aerosols are inhaled. The incubation period normally ranges from 2 to 10 days. Infection with the bacterium *Legionella* commonly presents as severe pneumonia, often requiring hospitalization. Human-to-human transmission is exceptional, and until recently, had never been described (see References)

Many reported Legionnaires' disease outbreaks have been associated with hotel stay (travel-associated Legionnaires' disease (TALD)) or hospital admission (health-care associated Legionnaires' disease), due to colonisation of the complex water systems of large buildings. Persons admitted to hospitals are particularly vulnerable if appropriate preventive measures are not maintained in hospital water systems, on account of their risk factors for acquisition of legionellosis. Risk factors include age >50 years, current or past smoking, diabetes, chronic lung disease, systemic malignancy and renal or hepatic failure.

Data on the prevalence and epidemiology of Legionnaires' disease in South Africa are limited. Sporadic disease has been reported in a recent study of syndromic pneumonia surveillance at two sentinel sites in South Africa from June 2012 through September 2014, in which *Legionella* spp. were detected in 21 (1.2%) of 1805 cases (see References). This study reported that community-acquired LD in South Africa occurs predominantly in chronically ill adults with HIV and/or TB infection, and the majority of cases are not diagnosed and are sub-optimally treated.

In December and early January 2016, the NICD and NHLS Infection Control Laboratory received a notification from the European Legionnaires' disease

Surveillance Network (ELDSNet) that 3 Dutch travellers who had stayed at a Cape Town hotel in March 2014 (1 case) and December 2015 (2 cases) had subsequently developed LD. The hotel was notified, and a risk assessment audit of the facility was conducted by the NHLS Infection Control laboratory and the NICD in January 2016. The hotel was found to have a *Legionella* control programme in place, with no prior samples testing positive for *Legionella*. The hotel was found to not have any high-risk features such as decorative water features, sauna, jacuzzi or gym. Water samples were taken from hot and cold water tanks and the rooms where patients had stayed, as well as a randomly-selected room on each floor of the 13-storey building. A total of 43 water samples was collected. Emergency remedial action was requested including increasing the hot water temperature, hyper-chlorination of the water system, closing guest rooms where cases had stayed, as well as the distribution of a letter and information sheet to all guests who stayed in the hotel within a 2-week window period before the date of the report.

Legionella pneumophila serogroup 1 was detected in both hot water tanks, one cold water tank and from water obtained from the room where one of the cases had stayed. A follow-up audit was carried out in February to verify completion of corrective actions and to re-sample. The NHLS and NICD are in on-going communication with the management of the hotel regarding *Legionella* remediation and control.

Legionnaires' disease can be radiologically and clinically indistinguishable from other aetiological causes of pneumonia. Penicillins and other β -lactam antibiotics which are the first line of treatment advised for community acquired pneumonia, are inactive against *Legionella* spp. Therefore a high index of suspicion is required, and diagnostic tests for LD should be specifically asked for, especially in the following clinical scenarios: 1) patients with severe pneumonia, in particular those requiring intensive care; 2) immunocompromised individuals with pneumonia; 3) patients with pneumonia in the setting of a legionellosis outbreak; 4) patients who have travelled away from their home within two weeks before the onset of illness, and 5) patients suspected of health-care associated pneumonia.

Available test methods include urinary antigen test

(UAT), and culture and real-time PCR on lower respiratory tract specimens such as sputum. For every probable or confirmed case of Legionnaires' disease, a case investigation (form available on the NICD website www.nicd.ac.za) should be conducted to identify potential sources of exposures. The local health department, as well as NICD, should be notified as soon as possible in order to formulate an appropriate public health response, and prevent further cases. For further information please refer to the NICD guidelines for Legionnaires' disease, or contact the NICD (outbreak@nicd.ac.za) or Dr Nicole Wolter nicolew@nicd.ac.za.

References

Correia AM, Ferreira JS, Borges V, Nunes A, Gomes B, Capucho R, *et al.* Probable person-to-person

transmission of Legionnaires' Disease. *N Engl J Med.* 2016 Feb 4;374(5):497-8.

Wolter N, Carrim M, Cohen C, Tempia S, Walaza S, Sahr P, *et al.* Legionnaire's disease in South Africa, 2012-2014. *Emerg Infect Dis.* 2016 Jan;22(1):131-3.

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