Investigation of a Nosocomial Legionnaires' Disease in a Neurosurgery Ward

Lai WMY(1), Yip KS(1), Lee RA (2), Chow SH(1), Wong YCA(1), Mui ML (1), Wong E(3), Kwok J(3)

Infection Control Team(1), Clinical Microbiology(2) Facilities Management(3), Pamela Youde Nethersole Eastern Hospital

Keywords:
Legionnaires' Disease
Nosocomial

Introduction
Legionnaires’ disease (LD) is an acute pneumonia caused by inhalation or aspiration of aerosols contaminated with the Legionella bacterium. Nosocomial LD associated with a high fatality and hospital has incorporated HA Guideline on Prevention of Nosocomial LD into hospital Prevention and Maintenance program since March 2013. On 11 Nov 2014, Hospital Infection Control Team was notified by Clinical Microbiologist that a urine specimen of a 66-year-old male from a Neurosurgery ward was tested positive for Legionella pneumophila serogroup 1 antigen by urinary antigen test. In view of the case has been hospitalized continuously for ≥ 10 days before the onset of illness, it was defined as a definite Nosocomial LD and required in-depth investigation and attention in hospital.

Objectives
To identify and eliminate possible source of the nosocomial infection and make recommendations as enhanced preventive measures in future.

Methodology
A Hospital Outbreak Control Team including representatives from Center for Health Protection and HA Chief Infection Control Office was convened to lead source investigation and advise control measures. 1. Retrospective case review and prospective case surveillance were conducted to identify if more cases were affected. 2. Environmental investigation was conducted in affected ward and hospital water supply system to identify any possible reservoir. 3. Identify control measures to remove potential sources of infection.
126 patients were identified during the retrospective case review while 19 were identified in the prospective case surveillance. 16 patients reported fever and/or respiratory symptoms and consented for urinary antigen test and all of them were tested negative. No LD reported from the 145 affected patients. Environmental investigation: i. 32 pairs of water samples and 14 environmental swabs were collected, of which 7 water samples and 4 environmental swabs were tested positive for Legionella species. 4 out of 6 tap aerators (66.7%) were tested positive for Legionella species. ii. 3 “dead legs” were identified during mapping of pipework and all were taken down. 16 swab samples from the water pipes were sent for laboratory investigation. 4 were tested positive for Legionella species. Among all the samples tested positive for Legionella species, Legionella pneumophila serogroup 1 was detected from 8 samples, they were showers (2), tap water (2), tap aerators of washbasins (2) and swab samples of “dead legs” (2). Control measures Suspended use of shower facilities, connect 0.2 μm bacterial filters to water taps and perform chemical disinfection of water supply system of the ward. No significant levels of Legionella species were detected in post-disinfection water samples. Conclusion Although Neurosurgery ward was not defined as high risk area and regular replacement of shower heads & hoses in this area is not mandatory according to HA recommendation, there will be some high risk patients stayed in a non-high risk ward. Hospital maintenance program has to take this into consideration and current scope of preventive measures should expand to all clinical areas without risk stratification. Tap aerators have potential risk on Legionella cultivation and deserve attention while planning of preventive measures in future. It is worthwhile to document alteration of water distribution system, eliminate “dead legs” and prioritize the removal plan in hospital.