衞生防護中心
Centre for Health Protection

Scientific Committee on Emerging and Zoonotic Diseases

Consensus Summary of Recommended Strategy for Prevention and Control of Legionnaires' Disease in Hong Kong

Legionellae are ubiquitous in aqueous environments including man-made water systems such as potable water supplies systems. It is difficult to achieve long-term elimination of legionella in potable water systems and recolonisation of legionella after disinfection is common. Immunosuppressed patients are most at risk. For the prevention of Legionnaires' disease (LD) in the community, public education on preventive measures for the general public and immunosuppressed persons is essential.

2. The Scientific Committee on Emerging and Zoonotic Diseases (SCEZD) has reviewed international practices in environmental investigation and sampling for LD cases. International health or relevant authorities generally do not recommend routine environmental investigation and sampling for sporadic community-acquired cases. In general, environmental sampling is only recommended for investigations involving hospitals, residential institutions and disease clusters or outbreaks where a common potential exposure has been identified through epidemiological investigations.

3. Locally, among cases with both respiratory specimens and environmental samples collected from related water systems tested positive for *Legionella pneumophila* serogroup 1 (Lp1) from 2011 to date, molecular typing studies conducted by the Centre for Health Protection (CHP) of the Department of Health so far have not detected the same sequence-based type of Lp1 bacteria between the human and environmental samples. Hence, the environmental sites with Lp1 detected were probably incidental findings and unlikely to be the source of infection for the cases.

4. Based on the review of the local epidemiology, scientific literature and practices in major developed countries, SCEZD recommends the following strategy for investigation of LD cases in Hong Kong.

5. CHP should continue to conduct epidemiological investigations to identify potential sources of infection, high-risk exposures and clusters. In general, environmental investigation and sampling from potential sources are recommended to be carried out for LD only if one of the following criteria is met:

i. A single definite or possible nosocomial case associated with high-risk areas of a hospital (e.g. wards with severely immunosuppressed patients such as transplant unit, intensive care unit, etc.), i.e. the patient stayed in the hospital during the entire or part of the incubation period (IP) (two to ten days before onset) respectively;
ii. The patient spent the whole IP as a resident of a residential institution, such as a residential care home for the elderly (RCHE) or a residential care home for persons with disabilities (RCHD), or as an in-patient in low-risk areas of a hospital;
iii. Two patients with onset within six months **and** who had common exposure for a portion of the IP to either a residential institution such as RCHE/RCHD, or low-risk areas of a hospital;
iv. The patient had exposure to a high-risk source, such as aerosol-generating device (e.g. respiratory equipment), during the IP;
v. The patient visited a high-risk venue, such as spa, jacuzzi or whirlpool, during the IP; and
vi. A cluster which is defined as two or more confirmed cases with onset within six months and common exposure to the same potential source of infection during the IP (e.g. a cooling tower, living in the same building, etc.).

6. Regarding environmental investigation, CHP should liaise with the Electrical and Mechanical Services Department to collect samples from potential sources for testing of legionella. Currently, there is no established dose–response relationship for legionella infections, and the legionella bacteria count necessary to cause an outbreak is unknown. Besides, review of overseas guidelines on prevention of LD/legionellosis found that there is neither international consensus nor scientific evidence on the action levels of legionella count. The following risk based action levels of total legionella count for control measures are recommended for water samples collected from different settings or potential sources:

i. Cooling towers associated with two cases within six months: ten colony-

forming units per milliliter (cfu/ml) or above;

ii. Water systems in buildings in community epidemiologically linked to two cases within six months: ten cfu/ml or above;

iii. Water systems in residential institutions (RCHE or RCHD) and low-risk areas of hospitals associated with either any case who stayed there for the whole IP or two cases who spent part of the IP there within six months: one cfu/ml or above;

iv. Water systems in high-risk areas of hospitals (e.g. wards with severely immunosuppressed patients such as transplant unit, intensive care unit, etc.) associated with any case: 0.1 cfu/ml or above; and

v. Hot tubs (e.g. spa, Jacuzzi or whirlpool) and aerosol-generating devices (e.g. respiratory equipment) associated with any case: 0.1 cfu/ml or above.

7. Regarding the actions in response to detection of legionella in the above water samples, these will depend on the nature of the suspected source of infection, the proportion of specimens with positive laboratory results, and specific risk assessment of individual scenarios. Specific actions might include installation of point-of-use water filters, removal of contaminated tap aerators or shower facilities, possible disinfection of the water systems concerned, etc.

8. Proper design, operation and maintenance of water systems are important to prevent proliferation of legionella. In the long run, the use of slow release chloramine orthophosphate for the disinfection of potable water supply in Hong Kong should be studied to further decrease the risk of legionellosis.

Centre for Health Protection
December 2015