Introduction to Communicable Disease Surveillance and Investigation in North Carolina

Legionellosis

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Learning Objectives

1. Identify risk factors for legionellosis
2. Recognize healthcare-associated and travel-associated legionellosis cases as a public health priority
3. Recognize the limitations of environmental testing in a legionellosis investigation

Legionella species

- Gram-negative bacteria
- Causative agent of Legionellosis
  - Typically *Legionella pneumophila*
  - Nationally notifiable disease
- Source
  - Found naturally in freshwater environments, but in insufficient numbers to cause disease
  - Outbreaks commonly involve warm water sources
    - Decorative fountains
    - Hot tubs
    - Cooling towers

Transmission of *Legionella*

- Inhalation of mist or vapor that contains the bacteria
- Not transmissible person-to-person
- Most people who are exposed to the bacteria do not become ill

Risk Factors for Legionellosis

- Age >50 years
- Chronic lung disease (e.g. emphysema)
- Current or former smoker
- Immunocompromised
- Use of a CPAP machine
- Recent travel with overnight stay outside the home
- Exposure to whirlpool spas
- Recent repairs or maintenance work on domestic plumbing

Clinical Description of Legionellosis

Two clinically and epidemiologically distinct illnesses:

1. Legionnaires' disease
   - Characterized by: fever, myalgia, cough, and clinical or radiographic pneumonia
2. Pontiac fever
   - A milder illness without pneumonia

Comparing Legionnaire's Disease and Pontiac Fever

	Legionnaires' Disease	Pontiac Fever
Incubation period	2-10 days	5-72 hours
Radiographic evidence of pneumonia	Yes	No
Hospitalization	Common	Uncommon
Case fatality	5-30%	0%

http://www.cdc.gov/legionella/clinicians.html

Control of Communicable Diseases Manual, 19th Edition, 2008

Confirmed Case

Classification

A clinically compatible case that meets at least one of the confirmatory laboratory criteria

Laboratory

- Culture:
  - Respiratory secretions
  - Lung tissue
  - Pleural fluid
  - Other normally sterile fluid
- Urine antigen:

  L. pneumophila serogroup 1
- Paired serology:

  ≥4x antibody titer to *L. pneumophilia* serogroup 1

http://www.cdc.gov/legionella/health-depts/CSTE-position-statement.html

Suspect Case

Classification

- A clinically compatible case that meets at least one of the suspect laboratory criteria

Laboratory

- Paired serology
  - ≥4x antibody titer to specific species or serogroups of *Legionella* (other than *L. pneumophila* serogroup 1)
  - ≥4x antibody titer to multiple species of *Legionella*
- DFA* or IHC** staining
  - Detection of specific *Legionella* antigen or organism in respiratory secretions, lung tissue, or pleural fluid

*Direct Fluorescent Antibody
**Immunohistochemistry

http://www.cdc.gov/legionella/health-depts/CSTE-position-statement.html

Legionellosis and Public Health

Diagnosis and timely reporting are important

Case identification implies presence of environmental source

- Other susceptible individuals may be exposed

High-priority legionellosis investigations

- Healthcare-associated cases
- Travel-associated cases

Ask patient about healthcare exposures and travel in 10 days prior to symptom onset.

Travel-associated Legionellosis

- A case with a history of spending at least 1 night away from home (either in the same country of residence or abroad) in the 10 days before onset of illness
- May be used for either confirmed or suspect cases
- CDB shares detailed travel exposure information with CDC to identify cases that may be travel-associated

http://www.cdc.gov/legionella/health-depts/CSTE-position-statement.html

Healthcare-Associated Legionellosis

- A case with a history of spending the entire 10 days before onset of illness in a hospital or long-term care facility AND has no alternate exposures.
- Even a single healthcare-associated case requires enhanced surveillance and could require environmental testing

Environmental Testing for *Legionella*

- Not routinely done
- May be performed if
  - ≥2 cases with an epidemiologic link to the same location
  - 1 healthcare-associated case with no alternative exposures and others at high risk
  - A new case in the setting of a previous outbreak
- Clinical isolates are necessary to interpret findings of environmental investigation

Summary

- Numerous risk factors for legionellosis
- Healthcare-associated and travel-associated legionellosis cases are a public health priority
- Environmental testing is not routinely performed for legionellosis investigations

References

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