Leptospirosis

Epidemiology in New Zealand

The annual number of leptospirosis notifications fell dramatically between 1980 and 2000 and has fluctuated since.

Sources of infection can include contact with animals or with soil and water contaminated by animals. Leptospirosis is endemic worldwide with higher incidence in tropical countries. Travellers participating in recreational water activities such as rafting or kayaking are at higher risk of the disease, especially after heavy rainfall, which facilitates the spread of organisms.

Most cases in New Zealand have worked in the meat-processing industry or have had recent farm contact. Human leptospirosis is less likely to be seen where animals have been vaccinated.

Isolates seen in New Zealand include *Leptospira borgpetersenii* serovar hardjo, *L. interrogans* serovar pomona, and *L. tarassovi*. The two most common serovars seen worldwide, canicola and icterohaemorrhagiae, are not considered endemic in New Zealand.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Case definition

Clinical description

An acute illness characterised by fever, chills, headache, myalgia, nausea, diarrhoea, abdominal pain, meningitis, cough and conjunctival suffusion. Manifestations of severe disease can include jaundice, renal failure, haemorrhage, pneumonitis and haemodynamic collapse.

Laboratory test for diagnosis

Laboratory confirmation requires at least one of the following:

- isolation of leptospires from a clinical specimen
- detection of leptospiral nucleic acid from a clinical specimen
- a four-fold or greater rise in leptospiral microscopic agglutination titre (MAT) between acute and convalescent sera
- single high antibody titre of $\geq 400$ in the MAT.

It is recommended that both nucleic acid testing (NAT) and MAT testing be undertaken to improve diagnostic accuracy.

**Serology**

IgM can be detectable within the first week of illness and can persist for months. Seroconversion can take up to 3 weeks from the onset of symptoms. IgM is useful as a screening test but not a diagnostic test because of cross-reactivity with other diseases.

Acute and convalescent samples need to be tested in parallel by MAT. A four-fold or greater rise in titre or a demonstrated seroconversion is indicative of current or very recent infection. There should be a minimum of 2 weeks between sampling for acute and convalescent sera.

ESR-NCBID is the national reference laboratory for MAT testing.

**Nucleic acid testing (for example, polymerase chain reaction – PCR)**

NAT has the highest sensitivity of all available diagnostic tests and can be used for diagnosis in the acute septicaemic phase of the disease before an antibody response is mounted. The timing of the appropriate specimen is essential for a correct diagnosis. Leptospires can be excreted intermittently in the urine. Therefore, a negative result in the context of a compatible clinical illness cannot exclude the diagnosis of leptospirosis.

In cases of high clinical suspicion, a second urine sample should be submitted if the initial specimen tested negative by NAT.

**Case classification**

- **Under investigation**: A case that has been notified, but information is not yet available to classify it as probable or confirmed.

- **Probable**: A clinically compatible illness with a single raised agglutination titre by MAT of $< 400$ (that is, less than the level required for a confirmed diagnosis).

- **Confirmed**: A clinically compatible illness that is laboratory confirmed.

- **Not a case**: A case that has been investigated and subsequently found not to meet the case definition.

**Spread of infection**

**Incubation period**

Usually 10 days, with a range of 2–30 days.
Mode of transmission
Animals are the primary hosts and excrete leptospires in their urine. The organisms contaminate groundwater, soil and vegetation. Meat-processing staff may be exposed by direct contact with animal urine or organs of the renal tract. Leptospires enter humans through mucous membranes and skin (especially when abraded).

Period of communicability
Person-to-person transmission is very rare.

Animals may excrete leptospires in urine for months to years. The organisms may remain viable for weeks in groundwater and moist soil.

Notification procedure
Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

All confirmed cases should be referred to the local branch of the Department of Labour under the Notifiable Occupational Disease System (NODS), for occupational investigation. The case must give their consent, which may be verbal, before they can be referred. A Department of Labour inspector will investigate and enforce prevention and control.

Management of case
Investigation
Obtain a history of occupational or other contact with farm animals, recreational water activities and travel. Ensure serovar-specific MATs are tested on the case’s serum.

Information on serovars can assist in investigating the source of infection. Exotic serovars in animals are notifiable to the Ministry for Primary Industries (formerly the Ministry of Agriculture and Forestry) under the Biosecurity Act 1993. The Ministry for Primary Industries can assist with the investigation of animal sources.

Restriction
Nil.

Treatment
In consultation with the primary care or secondary care service.

Counselling
Advise the case of the nature of the infection and its mode of transmission.
Management of contacts

Definition
A contact is any person who has experienced similar exposures to the case within the preceding 10 days.

Investigation, restriction and prophylaxis
Nil.

Counselling
Advise all contacts to seek early medical attention if symptoms develop.

Other control measures

Identification of source
Check for other cases among contacts.

All confirmed cases should be referred to the local branch of the Department of Labour under NODS, for occupational investigation. See ‘Notification procedure’ above.

In the case of a recreational water source, all swimming pools should comply with the New Zealand Standard for Pool Water Quality (NZS 5826:2010).

Disinfection
Articles soiled with urine should be cleaned and disinfected.

Health education
Educate the public to avoid swimming or wading in potentially contaminated waters supplies.

Reporting
Ensure complete case information is entered into EpiSurv.

Medical officers of health are responsible for investigating a cluster of cases.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.
References and further information
