Rickettsial disease and Q fever

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Note: The description for Q fever follows the description for Rickettsial disease in this chapter.

Q fever was once considered part of the genus *Rickettsia*. It is now classified in a separate genus but the notifiable infectious diseases schedule has not yet been updated to include Q fever. Reporting by medical practitioners is recommended with informed patient consent.¹

¹ In this case, informed consent includes understanding and agreement by the patient that their name and some details will be provided by the responsible medical practitioner to the local medical officer of health for public health follow-up and inclusion in national infectious disease statistics.
Rickettsial disease

Epidemiology in New Zealand

Rickettsial disease in humans (spotted fevers, typhus or scrub typhus) is caused by a number of related species of intracellular bacteria of the genus *Rickettsia* that have blood-feeding arthropod vectors. Each species is associated with a different spectrum of clinical features, geographical distribution, insect vector (tick, louse, flea, mite or chigger), seasonal incidence and other epidemiological factors.

*R. typhi* is endemic in some parts of New Zealand.

*R. felis* has been detected in fleas taken from dogs and cats in the central-lower North Island, but no human cases have been reported.

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

Rickettsial disease characteristically presents with fever, headache and malaise; there is often lymphadenopathy, myalgia and a rash, either macular or haemorrhagic. Some cases may form an inoculation eschar (ulcer or papule often with a black crust). Neutropenia, thrombocytopenia and moderate increases in transaminases are common laboratory abnormalities. There is great variation in the severity of illness, depending on the organism involved, but continuing fever, cough and signs of bronchitis or pneumonia, photophobia, conjunctivitis, delirium, deafness and hepatosplenomegaly may be present.

Laboratory test for diagnosis

Consult ESR or LabPlus, Auckland District Health Board for appropriate testing.

Laboratory confirmation requires isolation of *Rickettsia* spp. in a clinical specimen.

The following serological tests are available at LabPlus:

- *Rickettsia typhi* (formerly *R. mooseriI*) for murine typhus
- *Orientia tsutsugamushi* (formerly *R. tsutsugamushi*) for scrub typhus group
- *Rickettsia conori* for tick typhus group.
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 antibody titre.
- **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.

Cases can be further classified in Episurv by disease:

1. **typhus:** caused by *R. prowazekii* (the agent of classical epidemic typhus)
2. **murine typhus:** caused by *R. typhi* (formerly called *R. mooseri* endemic or ‘shop’ typhus)
3. **rickettsial disease:** all other diseases caused by organisms of the *Rickettsia* genus. This includes scrub typhus, caused by *Orientia tsutsugamushi*. Record species, if laboratory confirmed, in ‘Other lab details’.

Spread of infection

**Incubation period**

- Rickettsial disease: Variable dependent on the disease agent (usually between 1–3 weeks).
- Murine typhus fever: 1–2 weeks.
- Scrub typhus: 10–12 days (6–21 days).
- Tick typhus: 5–7 days.

**Mode of transmission**

*Rickettsia* spp. live harmlessly in the salivary glands or gut of arthropods, especially fleas and ticks, and are perpetuated in the vector by trans-ovarian spread to the young. Transmission to humans occurs when arthropod faeces, regurgitated material or saliva is inoculated into a bite wound.

**Period of communicability**

There have been no known direct transmissions of rickettsial disease between people.

**Notification procedure**

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

Investigation
Obtain a history of travel, contact with animals and insect bites. Ensure acute and convalescent serological diagnosis has been attempted.

When applying for laboratory testing, ensure that the travel history and likely incubation period are recorded on the laboratory form as these details inform the laboratory’s choice of test kit. For infections probably acquired overseas, it may be useful to discuss testing with the laboratory.

Restriction
Nil.

Treatment
Consult an infectious diseases physician. Tetracyclines and chloramphenicol are the drugs of choice.

Counselling
Advise the case and their caregivers of the nature of the infection and its mode of transmission.

Management of contacts
Advise anyone exposed to the same potential animal or arthropod source of the incubation period and typical symptoms of the infection. Encourage them to seek medical attention if symptoms develop.

Other control measures
Identification of source
Check for other cases in the community. If the infection may have been acquired in New Zealand, liaise with staff at the Ministry for Primary Industries and/or territorial authority to investigate potential animal reservoirs of infection. See ‘Reporting’ below.

If the infection has been acquired overseas, advise the case to check for retained vectors (for example, embedded ticks on body) and liaise with Ministry for Primary Industries staff to aid with identification and destruction after removal.

Disinfection and cleaning
Nil.
Health education

In the event of a New Zealand-acquired *Rickettsia* infection, consider direct communication with local parents, schools and health professionals to encourage prompt reporting of symptoms. In communications with doctors, include recommendations for diagnosis and treatment.

In the event of an endemic *Rickettsia* infection, take steps to eliminate rodents and fleas from affected households.

Reporting

Ensure complete case information is entered into EpiSurv.

On receiving a notification, medical officers of health should immediately notify the Communicable Diseases Team at the Ministry of Health. The Ministry will then notify the appropriate staff in the Ministry for Primary Industries so that further investigation of the source can be undertaken.

Further information


**Q fever**

**Epidemiology in New Zealand**

*Coxiella burnetii*, the only member of an intracellular bacteria genus that is related to the *Rickettsia* genus, causes Q fever. *C. burnetii* is not endemic in New Zealand. *C. burnetii* has a reservoir in birds and mammals, especially cattle, sheep and goats, and is most often an occupational disease affecting farmers, veterinarians and abattoir workers.

More detailed epidemiological information is available on the ESR surveillance website at [www.surv.esr.cri.nz](http://www.surv.esr.cri.nz)

**Case definition**

**Clinical description**

Q fever causes a variety of clinical syndromes. Asymptomatic infection may occur, but the onset of infection is usually acute and characterised by fever, rigors, sweats, severe headache, weakness and myalgia. Pneumonia may be a feature, and abnormal liver function tests are common. Features of chronic infection include non-specific febrile illness, pneumonia, subacute endocarditis, hepatitis and, less commonly, granulomatous lesions in bone, soft tissues or body organs. A post-Q fever fatigue syndrome has been described.

**Laboratory test for diagnosis**

Consult ESR or LabPlus, Auckland District Health Board for appropriate testing and interpretation of results.

**Laboratory confirmation requires** at least one of the following:

- detection of *C. burnetii* nucleic acid
- seroconversion or significant increase in antibody level to Phase II antigen in paired sera tested in parallel in the absence of recent Q fever vaccination
- isolation of *C. burnetii* by culture. (Note: This practice should be strongly discouraged, except where appropriate facilities and training exist.)

**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 antibody titre.
- **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
2–3 weeks.

Mode of transmission

*C. burnetii* can be found in many different body fluids and excreta of infected animals but are particularly concentrated in placental tissues. Humans acquire *C. burnetii* by inhaling contaminated aerosols or dust generated by placental tissues, birth fluids or excreta of infected animals. Airborne particles containing organisms may travel for more than 1 km. Transmission may also occur from direct contact with infected animals or other contaminated matter such as wool, straw or fertiliser.

Period of communicability

Q fever rarely spreads from person to person, reported only from cases with pneumonia. *C. burnetii* is highly resistant to drying and to a variety of physical and chemical agents, so viable organisms may remain in contaminated soils for several months.

Notification procedure

Q fever was once considered part of the genus *Rickettsia*. It is now classified in a separate genus but the notifiable infectious diseases schedule has not yet been updated to include Q fever. Reporting by medical practitioners is recommended with informed patient consent.²

Management of case

Investigation

Obtain a history of travel and direct contact with animals, wool, straw or fertiliser. Ensure acute and convalescent serological diagnosis has been attempted.

When applying for laboratory testing, ensure that the travel history and likely incubation period are recorded on the laboratory form as these details inform the laboratory’s choice of test kit. For infections probably acquired overseas, it may be useful to discuss testing with the laboratory.

² In this case, informed consent includes understanding and agreement by the patient that their name and some details will be provided by the responsible medical practitioner to the local medical officer of health for public health follow-up and inclusion in national infectious disease statistics.
Restriction
Nil.

Treatment
Consult an infectious diseases physician. Tetracyclines and chloramphenicol are the drugs of choice.

Counselling
Advise the case and their caregivers of the nature of the infection and its mode of transmission.

Management of contacts
For anyone exposed to the same potential animal or arthropod source, advise them of the incubation period and typical symptoms of the infection. Encourage them to seek medical attention if symptoms develop. Prophylactic doxycycline may prevent clinical Q fever illness when begun 8–12 days after exposure and continued for 5 days.

Other control measures
Identification of source
If the infection may have been acquired in New Zealand, liaise with Ministry for Primary Industries staff to investigate potential animal or bird reservoirs of infection.

Disinfection and cleaning
Nil.

Health education
In the event of a New Zealand-acquired Q-fever infection, consider direct communication with local parents, schools and health professionals to encourage prompt reporting of symptoms. In communications with doctors, include recommendations for diagnosis and treatment.
Reporting

Ensure complete case information is entered into EpiSurv. The current disease option for Q fever in EpiSurv is caused by *C. burnetii*.

On receiving a notification, medical officers of health should immediately notify the Ministry of Health Communicable Diseases Team. The Ministry will then notify the appropriate staff in the Ministry for Primary Industries so that further investigation of the source can be undertaken.

References and further information

