

### Introduction

Acute leptospirosis is one of New Zealand's most commonly acquired occupational zoonotic diseases. It has a substantial morbidity rate. Mortality is high overseas and there has been one fatality in New Zealand in recent times.

There are 3 consecutive phases during Leptopirois:

<b>Incubation Phase.</b>	There is usually a delay of 2 - 7 days before symptoms initially occur.
<b>Septicaemic Phase.</b>	For the next 3 - 7 days, Leptospire can be found in the blood, CSF, urine and most tissues.
<b>Immune Phase.</b>	The body reacts by creating antibodies. This phase can last 4 - 30 days, whereby Leptospire can only be found in the kidneys, urine and aqueous humor.

This summary suggests that general practitioners should:

- be on the alert for the disease – especially in patients with known occupational exposures such as in meat processing plants – and consider prompt treatment on clinical suspicion
- be aware of the pitfalls in traditional serology screening (see below) and be aware of a new PCR test which may aid diagnosis
- give basic advice about prevention
- use correct reporting procedures.

OSH produced guidelines about the prevention of Leptospirosis by farmers and meat processing companies in 2001.

In most parts of New Zealand the disease is confined to people working in industries with exposure to animals or freshly slaughtered carcasses. The most at risk exposure is to fresh animal urine and the largest single group of sufferers, over the whole country, are meat process workers working in the slaughtering area or gut/kidney processing area, though this pattern is not universal. The disease seems to be progressing from species to species (sheep and deer are now being infected) and slowly spreading throughout New Zealand from the North Island, as stock movements to the South Island increase, and possibly for a variety of other reasons. Recent ESR data suggest that the disease is becoming more widespread and that sheep are becoming a more important host.

OSH suggests that general practitioners have two functions in relation to Leptospirosis:

- Treating the patient as promptly as is possible by ensuring an accurate diagnosis and instituting appropriate treatment. An accurate diagnosis preserves the employee's ACC entitlements.
- Providing some advice to employees and their employers about prevention.

## **Treatment**

The treatment of acute leptospirosis is controversial with some reviews suggesting no overall benefit to patients from acute antibiotic treatment. Other reviews<sup>1</sup> state categorically that early treatment ameliorates symptoms and shortens the return to work time, a view supported by the practical experience of treating doctors in Leptospirosis prone areas.

OSH recommends:

- 1) Having a high index of suspicion in people who work with farm animals and meat processing employees – who present with flu like symptoms.
- 2) Carry out two sets of leptospiral titres one month apart, regardless of the progression or otherwise of the clinical illness or the result of the first sample. Do the first set of titres on the day of the first consultation, before any treatment.
- 3) Consider performing the PCR test (See below) as well as the more usual Serology test.
- 4) Prescribe a course of either Tetracycline or penicillin.
- 5) Monitor patients for signs of complications, of which renal failure is the most common.

## **Blood testing:**

**1 Traditional serology** can pose several unavoidable problems.

- 1) The test looks for antibodies to *Leptospira*. These take time to develop so an initial test may not come back positive.
- 2) The screening test used by local laboratories is different from the one used by ESR and in itself is not 100% reliable.
- 3) The diagnosis is based on a fourfold increase in titre, so if a baseline is not done a diagnosis cannot be made firmly (although the standards for diagnosis recommend that a dilution factor of 1:400 be considered indicative of recent infection).
- 4) Administration of antibiotics will depress the antibody response, compromising the ability to confirm a diagnosis using serology.

## **2 Polymerase Chain Reaction testing**

A relatively new PCR test for Leptospirosis has been developed at Canterbury Health Laboratories. This molecular assay allows for a diagnosis of Leptospirosis to be made at an earlier date (i.e. acute phase of the illness) than the existing Serology testing.

Although *Leptospira* are difficult to grow in the laboratory setting, and serology is currently performed only by the ESR leptospire reference laboratory, DNA can be detected using the PCR method.

Samples suitable for PCR testing for Leptospire are:

<b>Septicaemic Phase</b>	Blood, CSF, Tissue, or Urine
<b>Immune Phase</b>	Urine only

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<sup>1</sup> *Leptospire and Leptospirosis: 2<sup>nd</sup> edition* (1999); Faine S., Adler B, Bolin C and Perolat P. MediSci, Melbourne, Australia.

Within 7 days of the onset of clinical symptoms, a blood (EDTA) and urine sample is required. If there is suspicion or evidence of meningitis a CSF specimen is also recommended. Following the septicaemic phase, a urine sample would only be required, as the Leptospire may no longer be present in the blood. It is also important to realise that Leptospire could be intermittently excreted in the urine. Therefore a negative result may not exclude the diagnosis. If clinical suspicion remains, repeat testing of urine is recommended.

It is highly recommended that samples are collected and tested for the serology assays to augment the PCR testing. PCR is able to detect a minimum of 1-10 Leptospire/mL.

**Cost:** The cost of the PCR test is currently \$115 excluding GST, with the results being available within 24 hours.

### **Prevention**

Prevention is based around reducing or eliminating exposure to infected animal body fluids (urine). Full details are available in the OSH publication on Leptospirosis or the OSH website ([www.osh.dol.govt.nz](http://www.osh.dol.govt.nz)). The prevention message to give to at risk people is:

- 1) Immunisation of herds PLUS stock control is very effective for some species (dairy cattle and pigs but unproven for others).
- 2) Animal care workers need to avoid urine splashes or contact with potentially contaminated water by wearing appropriate clothing, covering open cuts and scratches and frequent hand washing.
- 3) Meat processing plants can control exposure by the means of shields over parts of the process line where urine or other body fluid splashes occur, the provision of appropriate personal protective equipment (PPE) such as face shields and gloves and frequent hand washing.
- 4) Meat processing plants and the like have a duty of information to their employees about the causation and symptoms of Leptospirosis and the need to consult a doctor promptly if the employee develops flu like symptoms.
- 5) Employees have a duty to comply with company requirements re using PPE.

### **Notification**

- 1) Leptospirosis is a Notifiable Disease.
- 2) If the exposure to Leptospira was work related the patient should be invited to sign a NODS card and forward it to OSH for investigation.

If you are in any doubt about the diagnosis, OSH suggests you seek advice from your local OSH Departmental Medical Practitioner or the Medical Officer of Health and for questions of treatment and prognosis a specialist infectious disease physician.

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