

# Leptospirosis: a zoonotic disease of many forms

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Two reports in this issue of the Journal highlight the fact that leptospirosis may be a severe disease with protean clinical manifestations<sup>1,2</sup> (pages 192 and 215). In its most severe form, it may require intensive care admission, with consequent significant morbidity and mortality. However, the clinical manifestations vary from asymptomatic to mild, right through to the severe forms described in these reports.

Leptospirosis is a contagious zoonotic disease of animals and humans caused by spirochaetes belonging to the genus *Leptospira*, of which there are two forms — pathogenic and non-pathogenic (benign) species.

In Australia, clinical leptospirosis occurs in cattle (serovars Hardjo, Pomona and Zanoni) and pigs (Pomona, Tarassovi and Bratislava). Sporadic cases occur in sheep (Hardjo), horses (Pomona) and dogs (Copenhageni and Australis). Clinical cases have been reported in humans, with serovars Australis and Zanoni predominating in the tropics, and serovar Hardjo, along with some Pomona and occasionally Tarassovi, predominating in the temperate regions of Australia.

The incubation period is usually 7–12 days, but may be as long as 30 days. In symptomatic patients, there follows an acute febrile, influenza-like illness with chills, sore throat, headache, myalgia, back pain, anorexia, nausea and vomiting. This phase usually lasts around 4–7 days, and widespread bacteraemic dissemination, including to the meninges, may occur. Clinical findings are non-specific but may include conjunctival suffusion, tender musculature and hepatomegaly. There are often abnormalities of liver and renal function, and thrombocytopenia is common.

In most patients, there is a defervescence of symptoms, followed by a second (immune) phase, although in severe infections the first and second phases merge imperceptibly. The patient may develop progressive jaundice with bleeding into the skin, mucous membranes and lung. Oliguria, renal failure, shock and myocarditis follow and are associated with a high mortality rate, as is significant pulmonary haemorrhage. Renal dialysis is often required in severe cases.

Symptoms of acute leptospirosis in animals include sudden agalactia in the lactating female, icterus and haemoglobinuria in the young, nephritis and hepatitis in dogs, and meningitis. Chronic leptospirosis can cause abortion, stillbirth, runtling and infertility. Chronically infected animals may remain asymptomatic carriers for life, with the organism located in the kidneys and reproductive organs. Humans may become infected by contact with urine through splashing onto mucous membranes or abraded skin, and with the reproductive organs at the time of birthing or slaughter.

Occupational groups most at risk in Australia include banana, cane and dairy farmers, veterinarians and abattoir

workers. Recreational leptospirosis accounts for fewer than 5% of all notifications in Australia. Most of these notifications occur in tropical areas, particularly in association with aquatic activities and after accidental exposure to rodent or marsupial urine.

Diagnosis rests chiefly with serological testing and may be problematic early in the disease. Culture is notoriously difficult, and polymerase chain reaction (PCR)-based tests are still mostly confined to research laboratories.

In patients with moderate to severe illness, treatment should be started as soon as possible, and may be effective even 4 days after onset. Penicillins and tetracyclines are active against leptospires *in vitro*. However, a recent Cochrane review concluded that evidence from randomised clinical trials is insufficient to provide clear guidelines for the treatment of leptospirosis, but did suggest that early doxycycline or penicillin may be useful if given in adequate dosage.<sup>3</sup> The review also concluded that prophylaxis may be achieved by doxycycline administration to soldiers in training and in endemic areas where risk of exposure is high, but was unable to extrapolate prophylaxis to other settings. Supportive therapy and careful management of renal, hepatic, haematological and central nervous system complications are vital. With early and effective intensive-care management of severe cases, mortality should be considerably reduced.

Prevention is difficult as the organism has not been eradicated from wild animals, which consequently infect domestic animals. Unfortunately, no human vaccine is currently available that covers a broad range of serovars with long-lasting immunity.

Leptospirosis will continue to be a problem zoonotic illness in Australia and New Zealand, with considerable difficulties remaining in its diagnosis and prevention. It should be suspected in any patient with occupational or recreational risk factors and compatible signs and symptoms.

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