Perspective on the primary care treatment of leptospirosis

Rod Nicholson MBChB FAFOM FRNZCGP, Departmental Medical Advisor, Occupational Safety and Health Service, Department of Labour and Dr Chris Walls MRNZCGP AFOM, Senior Departmental Medical Advisor, Occupational Safety and Health Service, Department of Labour

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

This summary suggests that general practitioners should:

- be on the alert for the disease – especially in patients with known exposures
- be aware of pitfalls in screening
- give basic advice about prevention
- use correct reporting procedures.

The Occupational Safety and Health Service of the Department of Labour (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 are meat process workers working in the slaughtering area or gut/kidney processing area. 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 of acute leptospirosis is controversial with reviews suggesting no overall benefit to patients from acute antibiotic treatment. Practical experience in leptospirosis prone areas, however, suggests that prompt administration of antibiotics markedly reduces symptoms and shortens the return to work time.

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. Carrying 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. Prescribing a course of either tetracycline or penicillin (see below).
4. Monitoring patients for signs of complications such as renal failure, the most common.

Blood testing for leptospirosis can pose several unavoidable problems.

1. The test looks for antibodies to Leptospira and as these take time to develop an initial test may not come back positive.
2. The screening test used by local laboratories is different from the one used by ESR.
3. The diagnosis is based on a fourfold increase in titre, so if a baseline is not done a diagnosis cannot be firm.
4. Administration of antibiotics will depress the antibody response, compromising the ability to confirm a diagnosis.

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). 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 and covering open cuts and scratches.
3. Meat processing plants can control exposure by the means of shields over parts of the process line and the provision of appropriate personal protective equipment (PPE) such as face shields and gloves.
4. Meat processing plants and the like have a duty of information to their employees about the 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 Medical Officer of Health and for questions of treatment and prognosis a specialist consultant physician.

Clinical features

Symptoms may vary extensively. Common symptoms include fever, headaches, myalgia, vomiting, red eyes, and a skin rash. Haemorrhage may occur due to capillary damage. Renal damage, liver failure, meningitis and respiratory distress may also occur. The disease is characteristically biphasic.

Leptospiraemic phase

- Four to nine days.
- Fever, chills, myalgia, conjunctival suffusion. Fever may peak to 39 degrees before settling.

Immune phase

- Six to 12th days.
- Fever and earlier symptoms return correlating with appearance of antibodies in the serum.

Case Report

A 54-year-old female cattle farmer presented in July 2002 with a week's history of generalised muscle aches, anorexia and mild diarrhoea and vomiting, not unlike the seasonal viral infection affecting a number of other patients. Apart from a fever, physical examination was unremarkable. Within 48 hours the backache and generalised muscle pain had become much more pronounced. At this time investigations showed an ESR of 73mm/Hr, mildly disturbed liver function tests, normal renal function, normal stool examination, a positive toxoplasmosis titre (IgG + IgM) of 1:256, a negative brucella abortus screen, a negative Paul Bunnell and negative leptospirosis antibody titres apart from a mild elevation of Leptospira Ballum to 1:100.

She improved a little symptomatically during the next week but then found that she could not actively abduct her left shoulder although passive abduction was normal. There was no shoulder pain but she still had generalised muscle aches and reported that her sister had polymyalgia rheumatica. She had marked weakness of her left supraspinatus, deltoid and infraspinatus.

At about this time, two weeks after her initial presentation, she was seen by a physician who suspected an acute brachial plexus neuropathy secondary to a systemic infection. This diagnosis was later confirmed by electromyography and nerve conduction studies that showed an absence of motor units in the axillary and suprascapular nerves typical for brachial neuritis.

While waiting for the results of this investigation, four weeks after her initial presentation, repeat blood tests showed a dramatic rise in her Leptospira Ballum titre to 1:3200 with no other significant antibody increases. Her liver function had returned to normal.

Her muscle aches and general malaise improved within three to four weeks but the weakness resulting from her brachial neuropathy required ongoing physiotherapy and gradually returned to normal over 12 months.

Leptospirosis was initially not strongly suspected in this patient and she was not treated with antibiotics. Acute brachial plexus neuropathy has been described in association with infections and vaccination[1] and with leptospirosis.[2]

Tony Townsend
General Practitioner
Whangamata

References

1. Miller JD, Pruitt S, McDonald TJ. Acute brachial plexus neuritis: An uncommon cause of shoulder pain. Am Fam Physician 2000; 62:2067–72.
2. Cumming WJ, Thrush DC, Kenward DH. Bilateral neuralgic amyotrophy complicating Weil's disease. Postgrad Med J 1978; 54(636):680–1.

Diagnosis

Cases must meet one of the following

- Isolation of Leptspira species from a clinical specimen
  OR
- Fourfold or greater rise in antibody titre by microagglutination (MAT)
  OR
- Stable high antibody titre (>400) by MAT in a patient with two of the following symptoms: fever, headache, chills, myalgia, conjunctival suffusion, meningitis, rash, jaundice or renal insufficiency.

Antibiotics

A Cochrane review was performed by Guidugli et al. in 2001 reviewing antibiotic use for leptospirosis.[1] Treatment with antibiotics was compared with placebo. Only three trials met the inclusion criteria. Treatment appeared to reduce mortality, reduce hospital stay and lead to a shorter period of fever. Antibiotic treatment has been recommended but there was not enough evidence to recommend specific antibiotic regimens.

It still remains unclear as to which antibiotic treatment is best for use with mild leptospirosis illness.[2] In practice either doxycycline or penicillin may be used. The jury is still out on whether or not to treat mild leptospirosis. By the time laboratory tests have confirmed the diagnosis, often the symptoms have resolved.

Guidugli et al. also performed a Cochrane review of antibiotic use for prevention of leptospirosis in 2003.[3] The purpose of the review was to evaluate the effectiveness and safety of antibiotic use. There appeared to be very few studies performed using antibiotics as prophylaxis. There is limited evidence that prophylactic use of antibiotics may be useful in specific situations, e.g. at risk soldiers.

Treatment

Severe illness

- Penicillin G 6–12 million u./day i.v.
- Ampicillin 500–1000mg q 6 h i.v.

Mild illness

- Doxycycline, Ampicillin, or Amoxycillin orally five to seven days.

Many people continue to experience symptoms for some months after they have been treated, e.g. severe headaches, nightmares and fatigue.

References

1. Guidugli F et al. Antibiotics for leptospirosis (Cochrane Review). The Cochrane Library, Issue 4, 2001.
2. Vinetz J.M. A mountain out of a molehill: Do we treat acute leptospirosis, and if so, with what? CID 2003 15 June; 36:1514–5.
3. Guidugli F et al. Antibiotics for preventing leptospirosis (Cochrane Review). The Cochrane Library, Issue 4, 2003.

Top 10 drugs by cost: New Zealand and Australia

	New Zealand (approximate costs, excludes hospital in-patient prescribing).[1]		Australia (cost to government in $A).[2]	
1	Omeprazole	$52,649,000	Atorvastatin	$335,848,732
2	Atorvastatin	$28,879,000	Simvastatin	$319,422,899
3	Simvastatin	$25,314,000	Omeprazole	$206,516,360
4	Paroxetine Hydrochloride	$23,703,000	Salmeterol & fluticasone	$154,529,922
5	Glucose Oxidase	$23,496,000	Olanzapine	$144,494,201
6	Fluticasone	$22,958,000	Pravastatin	$113,036,241
7	Olanzapine	$18,834,000	Clopidogrel	$96,996,332
8	Risperidone	$15,791,000	Celecoxib	$94,697,313
9	Salbutamol	$13,284,000	Rofecoxib	$90,538,887
10	Quinapril	$12,263,000	Pantoprazole	$85,609,475

1 BPAC prescribing report 21 Oct 2003.
2 Australian Prescriber 2003; 26(6):140