Teaching Point
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The patient who had a picnic at a waterfall and presented with haemoptysis and renal failure

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Case

A previously healthy 32-year-old man presented to this hospital with fever, chest discomfort, and generalized myalgia. He had a history of a picnic at a waterfall about 2 weeks prior to admission. The day after admission to hospital he suffered several bouts of haemoptysis. His haemoglobin decreased from 10.2 to 8.9 g/dl but the Coomb’s test was negative. The white blood count was 13.3 × 10^9/l and platelet count was 133 000 × 10^6/l. Chest X-ray showed bilateral alveolar opacities (Figure 1a). Lung function tests revealed increased carbon monoxide uptake of 171% of predicted value consistent with pulmonary haemorrhage. Aspartate transaminase and alanine transaminase were 33 iu/l and 128 iu/l (normal values 16–40 iu/l and 30–65 iu/l, respectively). Serum bilirubin was 33 μmol/l (normal value 3–24 μmol/l). Renal function was impaired (serum creatinine on admission was 385 μmol/l). He remained non-oliguric and was dialysis independent. There was no coagulopathy and a disseminated intravascular coagulation screen was negative. The antineutrophil cytoplasmic antibody (ANCA), antinuclear antibody and anti-DNA serology were all negative. The acute serum antibody titre for the leptospira microscopic agglutination test was positive at 1:160. Based on initial clinical suspicion of leptospirosis, he was started on intravenous crystalline penicillin 2 mega units four times a day for a total duration of 2 weeks. His temperature settled and renal function normalized (serum creatinine 9 days after admission was 91 μmol/l). A repeat chest X-ray 9 days later showed clear lung fields (Figure 1b). Convalescent serum leptospira titre done 1 week later was positive at 1:2560, consistent with recent illness due to leptospirosis.

Discussion

Leptospirosis is an infection with worldwide distribution. Rodents especially rats, are the commonest reservoir with infected animals excreting spirochaetes in the urine. Water is therefore the most frequent vehicle in the transmission of infection, partly because leptospires may survive in water for many months [1]. Patients present characteristically with headache, conjunctivitis, fever and renal failure in association with abnormal liver function tests and usually give a history of contact with a contaminated water source. The degree of severity may vary from hepatorenal failure and meningitis associated with classical Weil’s disease to mild influenza-like illness.

Leptospirosis is endemic in Asia as shown by serological surveys [2]. There have been reports of sudden outbreaks in Korea and Nicaragua after heavy rains and floods [3,4]. The pulmonary manifestations in leptospirosis are usually mild and of little clinical significance. Pulmonary haemorrhage as a presenting feature and life threatening complication is thought to be fairly uncommon [4,5]. Out of 93 patients studied after an outbreak of leptospirosis in Korea, nine (10%) patients were reported to have had severe pulmonary lesions. There were five fatalities, all of whom had severe haemoptysis before death. It was observed that the mortality was related to the severity of pulmonary lesion and massive haemoptysis rather than severity of renal failure or jaundice [4]. Tissue damage may be caused by mechanical trauma resulting from bacterial migration or by bacterial toxin, both of which are pro-
inflammatory, resulting in involvement of the capillaries and small blood vessels in the inflammatory response characteristically seen in vasculitis. This is thought to be responsible for many of the symptoms seen in severe leptospirosis [1].

Though the predominant manifestation of leptospirosis is usually liver and renal impairment, the presence of severe pulmonary haemorrhage may be a source of diagnostic confusion. The above case illustrates the need to consider leptospirosis in a patient presenting with pulmonary haemorrhage and renal failure. A high index of suspicion accompanied by prompt treatment is necessary, as severe pulmonary haemorrhage is associated with a high mortality [4,5]. The main differential diagnoses are the pulmonary–renal syndrome seen classically in the systemic vasculitides such as Wegener’s granulomatosis and microscopic polyangiitis which are frequently ANCA positive. Treatment of these cases will be immunosuppression with intravenous steroids, cytotoxic agents and possibly even plasma exchange. However such treatment in our patient would almost certainly have been fatal. Conversely, any delay in adequate immunosuppression in patients with immunologically associated (eg. ANCA positive) vasculitis may lead to irreversible renal damage or even death. Our patient responded well to treatment with intravenous penicillin with full recovery of lung and renal function. Although Penicillin G, 1.5 million units i.v. qds is recommended for leptospirosis, oral amoxycillin 1 g i.v. qds and Doxycycline 100 mg p.o. bd may also be effective [1,6].

**Teaching point**

In the patient who presents with pulmonary haemorrhage and renal failure, systemic vasculitis is the most likely diagnosis, but leptospirosis must also be considered, particularly in endemic areas.

**References**


**Fig. 1.** (a) Admission CXR demonstrating bilateral pulmonary opacities. (b) Convalescent CXR demonstrating resolution of pulmonary lesions.