

# Intense muscle aches after cleaning a boat on the Amsterdam canals

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A 37-year-old man presented to our emergency department complaining of intense muscle aches and malaise. The muscle aches had begun five days after he had cleaned his boat on the Amsterdam canals in the beginning of January and had persisted for another five days, despite taking acetaminophen and ibuprofen. The patient smoked one pack of cigarettes per day and reported an alcohol intake of six units per day and occasional MDMA and cannabis use. On physical examination, he was haemodynamically stable, had a temperature of 37.4°C and was jaundiced. Further examination, including a neurological exam, revealed no abnormalities.

Laboratory results were as follows: haemoglobin 6.1 mmol/l, leukocytes  $14.0 \times 10^9/l$  with a normal differentiation, thrombocytes  $47 \times 10^9/l$ , creatinine 199  $\mu\text{mol/l}$  (later increasing to 457  $\mu\text{mol/l}$ ), creatine kinase 19.180 IU/l, lactate dehydrogenase 830 IU/l, aspartate aminotransferase 669 IU/l, alanine aminotransferase 187 IU/l, bilirubin 166  $\mu\text{mol/l}$  (conjugated bilirubin 164  $\mu\text{mol/l}$ , later increasing to 450  $\mu\text{mol/l}$ ), alkaline phosphatase 129 IU/L, and gamma glutamyltransferase 38 IU/l. Urinalysis revealed >0 leukocytes per field and >50 erythrocytes per field. Urine culture and blood cultures were negative. Serology was negative for acute infection with HIV, EBV, CMV, hepatitis A, B, C and E virus and

Figure 1.



hantavirus. A chest X-ray and abdominal ultrasound were both normal. The ECG showed atrial fibrillation with repolarisation abnormalities, without abnormalities on transthoracic echocardiogram.

## WHAT IS YOUR DIAGNOSIS?

See page 320 for the answer to this photo quiz.

## DIAGNOSIS

After ruling out a toxic cause of rhabdomyolysis, we considered leptospirosis, because of the combination of rhabdomyolysis, acute kidney injury and severe conjugated hyperbilirubinaemia. Serology was obtained on the day of admission and was negative for IgM (ELISA); the agglutination test was weakly positive. Since seroconversion usually occurs after 7-10 days of symptoms, serology was repeated after one week. An IgM-titre of 1:640 was detected with a positive agglutination test, most strongly for serogroup Icterohaemorrhagiae (titre 1:1280). After two months, IgM was still positive with declining titres in the agglutination test. Polymerase chain reaction was negative and culture results were still pending at the time of submission. Based on serology, the infection was caused by the serogroup Icterohaemorrhagiae. The patient was treated with ceftriaxone 2g iv once daily for one week and has recovered completely.

Leptospirosis is a zoonosis caused by the spirochete *Leptospira interrogans*, which can be further subdivided into various serogroups such as the Icterohaemorrhagiae. It infects both wild and domestic animals, especially rodents. Humans can get infected through contact with water contaminated by animal urine. The incubation time ranges

from 4-14 days and is classically followed by a biphasic illness. The first phase is a nonspecific flu-like illness, which after a brief asymptomatic period is followed by a variable immune-mediated phase, which in severe cases may include acute kidney injury, rhabdomyolysis, severe conjugated hyperbilirubinaemia, myocarditis and diffuse haemorrhage due to capillary leakage.<sup>1</sup>

What is unique about this case is that it describes a leptospira infection in a temperate region during winter, whereas the majority of cases of leptospirosis occur in the tropics, with water temperatures high enough to enable the organism to survive for an extended period of time. A possible explanation is that the water temperature inside the patient's boat cabin may have been significantly higher than outside. Due to the cold temperature outside, rats may have used his boat as shelter.

## REFERENCE

1. Bharti AR, Nally JE, Ricaldi JN, et al, Leptospirosis: a zoonotic disease of global importance. *Lancet Infect Dis.* 2003;3:757-71.