

## Leptospirosis presenting with erythema nodosum

Leptospiral infections of human beings are uncommon in the United Kingdom, and the clinical features may be misleading, as is illustrated by the following case.

### Case report

A previously healthy 12-year-old boy was admitted to the Friarage Hospital, Northallerton, on 17 July 1975 with a 5-day history of malaise, intermittent fever, dysphagia, and anorexia, generalized aches and pains including some abdominal discomfort, and a rash over the legs. The illness had started 2 days after his return home from a camping holiday which included pony trekking and swimming in Lake Windermere.

On admission he looked ill with a temperature of 40°C and a rash characteristic of erythema nodosum over the front of the legs and to a small extent over the arms. At that time there were no other striking abnormal findings apart from moderate enlargement of the cervical lymph nodes. The heart appeared to be normal with a regular pulse rate of 100. There was no hepatosplenomegaly and no abnormal neurological finding. His condition caused considerable concern in the early stages as he continued to be markedly febrile and weak with headache and low backache. After 24 hours he developed signs of meningism, vomiting, and photophobia. He showed a surprising bradycardia (in view of the fever) which became progressive over the 3 days after admission, the pulse rate falling to 44/min but with no arrhythmia or abnormal blood pressure. Lumbar puncture performed on the third day after admission showed evidence of a lymphocytic meningitis.

He was treated from the first day in hospital with penicillin (initially orally 250 mg 6-hourly, but after 48 hours changed to intramuscular 0.5 MU 6-hourly), on the assumption that the most likely cause of the erythema nodosum was an infection with a  $\beta$ -haemolytic streptococcus, but this diagnosis was subsequently not confirmed. After 4 days in hospital his condition improved, the erythema nodosum having nearly disappeared by that time. Though his fever and other symptoms resolved shortly after this, the pulse rate did not rise to a normal level until a week after admission. The features of the illness are summarized in the Fig.

**Investigations.** On admission Hb was 12.8 g/dl, leucocyte count 5800/mm<sup>3</sup> ( $5.8 \times 10^9/l$ ) (polymorphs 80%, lymphocytes 16%, monocytes 4%), and ESR 20 mm/h.

Antistreptolysin titre was not raised at 150 IU/ml. Culture of the blood and throat were sterile, and no pathogens were isolated from a rectal swab. Tuberculin test was negative and chest x-ray normal. Electrocardiogram on 19 July 1975 confirmed the bradycardia and showed a varying PR interval but no other abnormality. CSF on 20 July contained 120 WBC/mm<sup>3</sup> ( $0.12 \times 10^9/l$ ), all lymphocytes, protein 0.25 g/l, and glucose 1.9 mmol/l (34 mg/100 ml). No organisms were seen and culture was sterile. Urine testing showed moderate proteinuria but no abnormality on microscopy or culture.

In view of the strange pattern of the clinical features paired sera were submitted to the Public Health Laboratory at Middlesbrough. Here, as is the custom with cases of pyrexia of unknown origin, the second serum was first screened in a complement-fixation (CF) test with various viral antigens and with a leptospiral antigen. The only significant finding was a rise in leptospiral antibody from 1/10 (8th day of illness) to 1/160 (17th day of illness). The sera were referred to the Leptospirosis Reference Laboratory. The CF result was confirmed. In a microscopic agglutination test with 25 antigen suspensions, arranged according to the current concept of serogroups, the first serum was negative at final dilutions of 1/30 and higher, whereas the second gave multiple cross-reactions to 1/300 and the Icterohaemorrhagiae serogroup suspension reacted strongly to 1/3000 (negative 1/10 000).

### Discussion

Leptospirosis in Britain is not a commonly diagnosed disease, about 60 cases being reported annually (Turner, 1973). The diagnosis was not suspected during the acute phase of this illness and therefore in the absence of clinical evidence of jaundice or haemorrhage, laboratory evidence of liver dysfunction or haemorrhagic tendency was not sought. Reports suggest that these clinical features only occur in a minority of infections with leptospira. By far the commonest signs and symptoms of leptospiral disease, apart from those of fever and malaise, are those related to meningitis—headache, neck stiffness, vomiting, and photophobia—particularly in the second week of the illness, which should have suggested the possibility of the diagnosis in this case (Lawson, 1971; Turner, 1973). Rashes are not a common feature, occurring in only 5 out of 40 cases reported by Lawson (1971). 'Pretibial fever', a relatively mild form of infection with a rash-like erythema nodosum is described in some leptospiral infections—such as the Fort Bragg episode (Gochenour *et al.*, 1952), and recently in an 8-year-old girl with an infection caused by

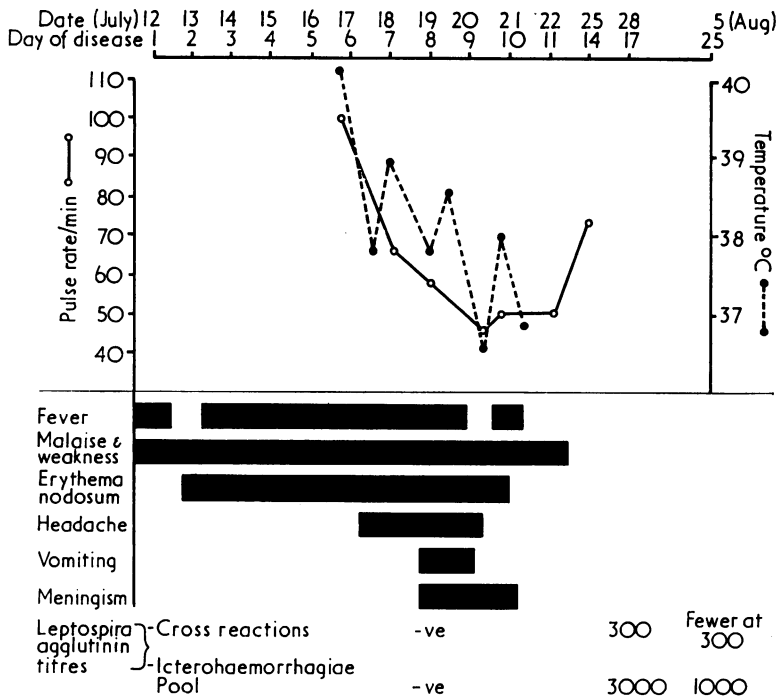


Fig. Showing the clinical and serological pattern of the illness.

*Leptospira canicola* (Derham *et al.*, 1976). Erythema nodosum rarely appears to be a feature of infections caused by strains of the Icterohaemorrhagiae serogroup.

Considerable anxiety was caused in this patient by the extreme bradycardia, thought at the time to be due to a conduction defect, possibly the result of myocarditis. Conduction defects are recognized as occasional features of leptospiral infections (Turner, 1973). Treatment with systemic penicillin in this case was correct and may have shortened the course of the disease, but the rationale by which it was chosen was not related to leptospirosis. The signs and symptoms of leptospirosis are numerous and varied and this case illustrated one bizarre form that the disease may present. The diagnosis should however be considered in unexplained febrile illnesses with lymphocytic meningitis.

#### Summary

An illness due to a leptospiral infection in a boy aged 12 years is described which, in addition to presenting with severe fever, malaise, and aseptic

meningitis, showed the rare features of severe bradycardia and erythema nodosum.

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