CASE REPORT

A CASE OF BORRELIA MENINGITIS

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A 16-year-old male with headache, vomiting, fever, neck stiffness, and a positive Kerning’s sign was referred to Boali Medical Center. The cerebrospinal fluid examination revealed a lymphocytic meningitis, and the blood smears was positive for Borrelia. He was successfully treated with doxycycline.

Keywords • Ardabil • Borrelia • meningitis

Introduction

Relapsing fever is caused by arthropod-borne spirochetes of the genus *Borrelia*, and is clinically characterized by recurrent episodes of fever and spirochetemia.1 – 3 Outbreaks of disease have been reported from throughout the world with the exception of a few areas in the South-West Pacific. Ardabil Province in North-West of Iran has long suffered from this tick-borne relapsing fever, which is caused by *Borrelia persica*.4, 5 The disease is endemic in the towns of Parsabad, Meshgin-Shahr and Khalkhal.

Case Report

A 16-year-old male student from Khalkhal town of Ardabil Province (North-West of Iran) was admitted to the Infectious Disease Ward of Boali Medical Center with fever, headache, and vomiting, which had suddenly been started 5 days prior to admission.

He suffered from malaise and occipital headache. His past medical history was negative for any significant medical/surgical diseases, and no medication had been administered prior to admission. He also denied any tick bites.

On physical examination, he seemed to be a well-developed and well-nourished young male. His body temperature (BT) was 36.4°C while his pulse rate, and blood pressure were 88 per minute and 88/50 mmHg, respectively. He was found to have neck stiffness, and a positive Kernig’s sign.

The physical examination was otherwise normal. Chest X-ray was also normal.

The results of blood studies were as follows: hemoglobin 12 g/dL, hematocrit 37%, white blood cells (WBC) count 6,600 (neutrophil 46%, lymphocyte 44%, monocyte 7%, and eosinophil 3%), the 1st hour erythrocyte sedimentation rate (ESR) 25 and the 2nd hour ESR 42. Urinalysis revealed 12 – 15 WBCs. Wright and Widal tests were negative; three blood cultures and the blood smear for malaria were also negative. In lumbar puncture, the patient had a high cerebrospinal fluid (CSF) pressure. CSF analysis results were as follows: protein 112 mg/dL, CSF sugar 65 mg/dL (blood sugar 110 mg/dL), and WBC count 47 (with 2% polymorphonuclear cells and 98% lymphocytes). CSF smear and culture were negative for bacteria.

In the 4th day of admission, BT rised to 39°C, but physical examination was otherwise normal. Repeated blood cultures and smears were performed, and ceftriaxon 2 g two times daily was started. In the 5th day, the Laboratory of Health Center reported that his blood smear was positive for Borrelia. Therefore, ceftriaxon was discontinued and doxycycline was started two times daily. He was discharged after 5 days of treatment without any signs or symptoms.

Discussion

A case of meningitis caused by *Borrelia* was reported. The diagnosis was made by blood smear examination.

The spirochetal relapsing fever is caused by

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different *Borrelia* species. Relapsing fever is well recognised as an infection of the blood, but little is known about its predilection for the nervous system. Cadavid and Barbour discussed that *Borrelia turricata* and *Borrelia duttoni* can cause neurological involvement as often as *Borrelia burgdorferi*, which can cause lymphocytic meningitis and peripheral facial palsy.4

In the study of Warren and Johnson, less common findings included nuchal rigidity, pulmonary rales and rhonchi, lymphadenopathy, and jaundice.1 Neurological findings have been reported in up to 30% of patients and include coma, cranial nerve palsies, hemiplegia, meningitis, and seizures.4 Cerebrospinal fluid pressure is usually elevated in patients with central nervous system involvement and is associated with pleocytosis (15 to 2,200 cells/mm³) and an elevated protein concentration (up to 160 mg/dL). The spinal fluid glucose level is normal. Spirochetes have been detected in cerebrospinal fluid by smear or by animal in up to 12% of patients with central nervous system signs.4,6–7

Spirochetal relapsing fever is an endemic disease in Ardabil Province and 126 cases have already been reported from Khalkhal district by Ardabil University of Medical Sciences.5 Considering the high frequency of the disease in the region, it is important to consider its unusual manifestations in all febrile patients.

**References**


5 Epidemiologic Study of Relapsing Fever in Ardabil Province by Communicable Diseases Prevention and Control Unit of Ardabil University of Medical Sciences; November 2000.
