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Case Report

Tick-Borne Relapsing Fever, a Neglected Cause of Fever in Fars Province

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Abstract

Tick-borne relapsing fever is an endemic disease in some parts of Iran. *Borellia persica*, the most common cause of this disease in Iran, has a wide geographic distribution and is present in Alborz and Zagros mountain chains.

Here we report a 16–year-old male patient who presented with two episodes of fever within 15 days. He had a history of few overnight stays in a cave of mountainous area in Fars province. Sites of tick bites were found on exposed areas of extremities. Spirochetes were detected in Wright-stained smears of the patient's peripheral blood. He was successfully treated with penicillin. To the best of our knowledge, there has been no reported case of tick-borne relapsing fever from Fars province in the literature during the last 28 years.

Tick-borne relapsing fever should be considered in patients with recurrent fever and peripheral blood smear should be investigated for spirochetes. Further seroepidemiologic studies should be carried out to determine the prevalence of this disease in Fars province.

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Keywords ● Borellia ● relapsing fever ● epidemiology ● Iran

Introduction

Tick-borne relapsing fever (TBRF) is an acute febrile illness. In Iran, TBRF is mainly caused by *Borrelia persica* and is transmitted by *Ornithodoros tholozani* ticks.[1,2] *Borellia persica* has a wide geographic distribution and is present mainly in east and west Azarbaijan, and Ardabil provinces and in Alborz and Zagros mountain chains.[1]

TBRF should be considered in patients with recurring fevers. Cardiac and neurological complications accompanied by long-term sequelae may develop with TBRF.[3] To the best of our knowledge, there has been no reported case of tick-borne relapsing fever from Fars province in the literature during the last 28 years.

Case Description

In the fall 2005, a 16–year-old male patient admitted to Dena Hospital, Shiraz, with two periods of fever within15 days. The initial episode of fever peaked at 40°C. It was accompanied by sweating, lasted for 7 days and resolved spontaneously. The patient had a second episode of fever 3 days later, peaking at 39°C. During the first fever episode, a general practitioner examined the patient and found no specific origin for the fever.

Medical and family histories were unremarkable. The patient did not receive any antibiotics. He had a history

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of few overnight stays in a cave of mountainous area of Kavar district near Shiraz a few weeks before presentation. There was no history of any other travel during one month prior to the first febrile episode. Review of organ systems was otherwise unremarkable.

On examination, the patient was febrile (39°C) and tachycardic (110 beats per minute). Other vital signs were stable, and physical examination was normal except for some erythematous papular lesions that were observed on exposed areas of extremities.

Laboratory investigation revealed white cell count: $10 \times 10^3/mm^3$, neutrophil: 52%, lymphocyte: 48%, hemoglobin: 13 g/dl, mean corpuscular volume (MCV): 85 f1, mean corpuscular hemoglobin (MCH): 25 pg, Platelet count: $363000/_{mm}{}^3$, and ESR: 12 mm/1^{st} hour. Wright and Widal tests were negative. Urinalysis and liver function test showed normal indices. Twice evaluations of peripheral blood smears were inconclusive. In Wright-stained smears of the peripheral blood in the third evaluation, scant spirochetes were detected (figure 1).

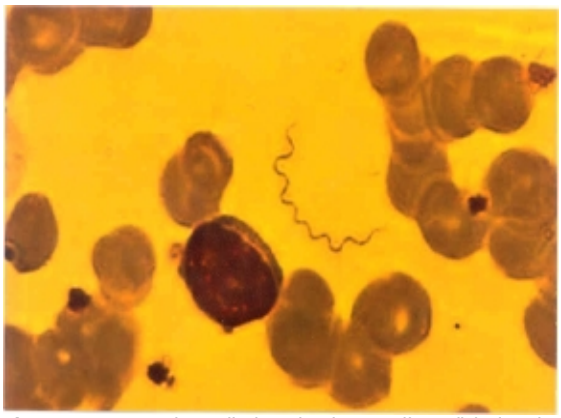

Figure 1: Loosely coiled spirochetes (*borrelia)* in the Wright-stained smear of the patient's peripheral smear.

Borrelia infection was documented, and the patient was treated with intravenous penicillin G (10,000 U/kg, four times a day). The patient became afebrile after 24 hours and was discharged from the hospital 72 hours after admission. Oral penicillin was continued (500 mg, four times daily) for 10 days.

Discussion

In Iran, TBRF is mainly caused by *Borrelia persica.*[1,2] It has a wide geographic distribution and is present in Alborz and Zagros mountain chains.[1] The prevalence of TBRF in different parts of Iran varies significantly.[4] According to the Iranian Ministry of Health, in years 2000, 2001, and 2002, total 201, 205, and 264 patients with relapsing fever have been reported, respectively. The highest record was from Ardebil province (119), followed by Zanjan (59), and Hamadan provinces (37).[5]

TBRF should be considered in patients with recurrent fever and a history of potential exposure to soft-bodied ticks.[3] Most cases of TBRF were reported to be caused by an overnight stay in wooden shelters or inns in mountainous areas, or traveling to endemic areas.[3,6] Our patient experienced two febrile periods and had a history of few overnight stays in a cave of mountainous area of Kavar district in Fars province a few weeks before presentation.

Although an appropriate history of exposure is by far the most helpful clue to the diagnosis of relapsing fever, patients are usually unaware of thick bite or exposure. And an experienced hematology technician is often the first person who makes the diagnosis by recognizing the spirochetes in a Wright-stained smear of the patient's peripheral smear.[6] A broad list of differential diagnoses should be reviewed for fever when TBRF is suspected. This will help rule out other possible causes of fever that, if misdiagnosed, could result in significant morbidity or mortality such as malaria, Dengue fever, leptospirosis, typhoid fever and brucellosis.[3]

It is believed that in some areas such as Fars province, however, many cases are not recognized or are misdiagnosed. So it results in an underestimation of the disease burden. The recommended treatment for patients with TBRF is doxycycline. If it is contraindicated (i.e., in children younger than 8 years or pregnant woman), erythromycin may be prescribed. Penicillins are also effective.[3] Empirical treatment with broad-spectrum antibiotics may modify the characteristic relapsing pattern of fever or cure it before a definite diagnosis is made.[6] Many patients have only a few relapses or may have no relapses.[7] Exposure to TBRF is decreased by rodent-proofing homes and avoiding animal burrows and caves.[3]

In conclusion, TBRF should be considered in patients with recurrent fever and peripheral blood smear of the patients should be investigated for spirochetes. Further seroepidemiologic studies should be carried out to determine the prevalence of TBRF in Fars province.

Conflict of Interest: None declared

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