Borrelia Recurrentis

Borrelia recurrentis is a spirochete with variable surface antigens that is transmitted by the human body louse. It causes relapsing fever and flu-like symptoms. Complications include neurologic, cardiopulmonary, and hematologic deficits. B. recurrentis can be identified by peripheral blood smear or polymerase chain reaction (PCR). Treatment includes beta lactams such as penicillin and ceftriaxone as well as doxycycline.



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Characteristics

Spirochete
Spiral-spirochete's in action
Borrelia recurrentis is a spirochete associated with relapsing fever. A spirochete is a type of bacteria characterized by a long, helical, nearly corkscrew structure.

Variable Surface Antigens
Various-Ant-Gems
Variability of surface antigens of this spirochete allows it to evade the immune system; this could explain the recurrent nature of fever in patients infected with B. recurrentis.

Transmitted by Louse
Loused-louse
Borrelia recurrentis is transmitted by a particular type of body louse known as Pediculus humanus. These lice live on human clothing and can be readily transmitted between people especially in colder months where they spend more time closer to each other. It is endemic in Ethiopia and likely other surrounding countries.

Clinical Manifestations

Relapsing Fever
Relapsing-fever-beaver
Patients with relapsing fever present with the sudden onset of fever and an intervening afebrile period, followed by recurrent episodes of fever.

Flu-like Symptoms
Thermometer and Ice-bag
Flu-like symptoms such as myalgias, fatigue, and cough are extremely common in patients with Borrelia recurrentis infection.

Neurologic Deficits
Defective-neuron
Neurologic manifestations, such as apathy, delirium, dizziness, and coma, are possible complications of Borrelia recurrentis infection.

Cardiopulmonary Deficits
Dead heart/lungs
Cardiopulmonary manifestations are common. These manifestations can range from mild nonproductive cough to acute respiratory distress syndrome and myocarditis.

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Hematologic Disorders

He-man-blood Disordered

Patients with this infection can present with hematologic disorders. This can be due to impaired hepatic production of clotting factors, blockage of small vessels, and thrombocytopenia.

Diagnosis

Blood Smear

Blood Smear on Glass

Thin and thick smears of blood can help in the identification of the organism, and this test is used for screening purposes.

Polymerase Chain Reaction (PCR)

Polly-mirror with Chain

If B. recurrentis is not identified on smear, but there is still a high clinical suspicion for disease polymerase chain reaction (PCR) testing should be performed.

Treatment

Beta Lactams

Black-beta-fish

Beta lactams such as penicillin and ceftriaxone can be used for the treatment of this infection. Adults usually receive ceftriaxone while children or pregnant patients usually receive amoxicillin and cefuroxime. In patients with spirochetal infections, initiation of antibiotic therapy often results in lysis of bacterial cell membranes, this releases large amounts of bacterial toxins (e.g., lipoprotein) into the bloodstream which results in fever, hypotension, tachycardia, headache, and flushing. This self-limited, febrile reaction usually occurs within the first 24 hours of antibiotic initiation and is called Jarisch–Herxheimer reaction, while symptoms usually resolve within 12-24 hours after the onset of symptoms, NSAIDs can reduce the severity and the duration of the symptoms and are often administered if symptoms are severe.

Doxycycline

Dachshund-cycling

Doxycycline inhibits bacterial protein synthesis by binding to the 30S ribosomal subunit. Doxycycline can be used for the treatment of B. recurrentis infection.

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