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A fatal case of gram negative bacterial sepsis associated with disseminated strongyloidiasis in an immunocompromised patient

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Case Report

A fatal case of gram negative bacterial sepsis associated with disseminated strongyloidiasis in an immunocompromised patient

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Abstract

We report a fatal case of disseminated strongyloidiasis in a patient with multiple myeloma receiving chemotherapy. A fifty-seven years old man presented with severe diarrhoea and vomiting, fever, weight loss and dysphagia due to mouth ulcers. Despite broad-spectrum intravenous antibiotics, albendazole (anti protozoal) and supportive treatment, the patient died of Gram-negative sepsis.

Introduction

Strongyloides stercolaris (S. stercoralis) is an intestinal nematode of humans. It has a worldwide geographical distribution but is endemic in the tropics and the subtropical regions of the world. It is estimated that tens of millions of persons are infected worldwide, although no precise estimate is available.[1] Although most infected individuals are asymptomatic, S. stercoralis is capable of transforming into a fulminant fatal illness under certain conditions that are associated with an immunocompromised host such as patients on steroid therapy, those infected with human T cell lymphotropic virus-1 (HTLV-1) and Human immunodeficiency virus (HIV).[2,3] The hyperinfective state is associated with massive invasion of the gastrointestinal and respiratory systems and may result in widespread dissemination into other body organs or invasive strongyloidiasis.[4]

Case Report

A fifty-seven years old male, diagnosed with multiple myeloma and on chemotherapy for thirteen days, came to the Aga Khan University Hospital with complaints of fever, loose watery diarrhoea, progressive weight loss and dysphagia due to mouth ulcers. On examination his vitals were stable and his systemic examination was unremarkable except that he was pale and mildly icteric. Routine investigations including blood complete picture, stool and urine routine examination, urine culture, liver and renal profiles were done. Haemoglobin was found to be 12.6 g/dl and total leukocyte count was 1.5 x10^9/l with 0.7% eosinophils .His liver and renal profiles were deranged with total bilirubin 2.7, gamma glutamine transferase 193 I.U/L, alanine transferase 193 I.U/L, blood urea nitrogen 45 mg/dl and creatinine 2 mg/dl. Routine stool and urine examination were normal with no microorganism grown in urine culture. The patient was admitted to the oncology section. Next day, he developed rectal bleeding and endoscopy showed multiple ulcerations. He was put on full supportive care and broad-spectrum antibiotics were prescribed but in spite of all efforts his condition continued to deteriorate. Two routine stool examinations were done, the first sent on day 8 of admission was unremarkable, however the second one sent on day 12 of admission revealed S. stercoralis larvae. Patient was immediately given antiprotozoal albendazole. Blood cultures on day 8 of admission showed E. coli. In spite of all supportive measures and broad-spectrum intravenous antibiotics and antiprotozoal medications, the patient died of sepsis after fourteen days of hospitalization.

Discussion

Our patient had multiple myeloma and was given appropriate chemotherapy including dexamethasone. Although clinical syndromes of S. stercoralis encompass a range from acute and chronic strongyloidiasis to hyperinfection and disseminated infection, hyperinfection results when host immunity is impaired especially by corticosteroid therapy and less commonly other immunosuppressive drugs, haematological malignancies, malnutrition or Infection with HTLV-1[5] or HIV.

The life cycle of S. stercoralis is complex. The usual route of infection in humans is through skin contact with soil contaminated with infective filariform larvae. Humans can also be infected via the lower gastrointestinal tract or perianal region from larvae that transform into infective stage during their passage in faeces. This "autoinfection" cycle explains the massive larval invasion seen in Strongyloides hyperinfection syndrome. The larvae pass via the bloodstream to the lungs, break into the alveolar spaces, ascend to the glottis are then swallowed and go to their final habitat in the small intestine. Deposition of eggs begins about four weeks after the initial infection. Our patient died of gram-negative bacteria sepsis. Gram-negative bacteria and other bowel flora may gain access to the blood stream through ulcers in the bowel or by transport on the surface or in the gut of migrating larvae. Bacterial sepsis, meningitis, and pneumonia occur frequently. The mortality associated

with untreated disseminated strongyloidiasis approaches 100%, and even with treatment it exceeds 25%. There are many case reports presents that demonstrate fatal outcome, Reddy et al[6] described two fatal cases of disseminated S.stercolaris one with pemphigus vulgaris and other with non Hodgkin lymphoma and both on steroid therapy. Hauber et al[7] reported fatal outcome of hyperinfection syndrome despite successful eradication of S.stercolaris with subcutaneous ivermectin. Treatment goal in strongyloidiasis is prevention of hyperinfection so total eradication of parasite is required as single viable worm is able io elicit hyperinfection in right circumstances. Treatment options available are azole group including Thiabendazole 25 mg/kg twice daily for three days, Albendazole 400mg twice daily for three days or Mebendazole. Ivermectin is better tolerated and became the drug of choice as compared to thiabendazole. Broad spectrum antibiotics should be used for gram negative sepsis in hyperinfection syndrome. In hyperinfection syndrome early diagnosis and treatment may be life saving.[1] So any individual with risk factors for acquiring S. stercoralis infection should be screened. Relying on stool studies alone for screening is inadequate, as supported by reports of hyperinfection developing in persons with negative screening stool exams. A single stool examination is said to be about 50% sensitive for diagnosing S. stercoralis infection in someone with symptomatic chronic disease.[8] In the asymptomatic individual, stool examination is probably even less sensitive.[1] To increase sensitivity of stool examination, faeces samples of these patients are processed and analyzed according to the following methods: Lutz, formalin ethyl acetate, Baermann, Harada-Mori and agar plate culture, in which agar plate culture had sensitivity of 68-70%.[9] Methods to sample duodenal fluid are more invasive and therefore less desirable.[1] Because of higher sensitivity, the diagnosis is often made by serological tests, such as the enzyme-linked immunoassay offered by Center of Disease Control and Prevention (CDC.Atlanta.USA.) that has sensitivity of 95%.Yori et al[10] conducted a stool and serosurvey for S. stercoralis in a community in the Peruvian Amazon region. S. stercoralis was identified in the stool of 69 (8.7%) of 792 participants. Six hundred nine sera were tested using by an enzyme-linked immunosorbent assay (ELISA), which had a sensitivity of 92% and a specificity of 94%.[10]

Conclusion

Early diagnosis of disseminated Strogyloides infection and prompt therapy have a marked impact on disease outcome. Screening using enzyme-linked immunosorbent assay (ELISA) should be considered mandatory for patients who have a history of travel or residence in a disease-endemic area especially with risk factors for disseminated disease (e.g., corticosteroid use and human T-lymphotropic virus type I infection). Stool microscopy using repeated stool samples should be used as a screening alternative in settings where serodiagnosis facility is not available.

Hyperinfection Strogyloides syndrome should be suspected in immunocompromised patients that develop severe generalized abdominal pain, ileus, diffuse pulmonary infiltrates, shock, meningitis or sepsis from gram negative bacilli.

Early diagnosis and prompt treatment are necessary if fatalities have to be avoided.

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