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Case Report

Disseminated strongyloidiasis in patients on immuno-suppressive therapy

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ABSTRACT

Strongyloidiasis is a disease that causes significant morbidity and rarely mortality in immunocompromised patients. We report two cases of disseminated strongyloidiasis infection while on steroids. The first patient was a known diabetic, hypertensive, and coronary artery disease who began on steroids with hemodialysis for biopsy-proven rapidly progressive glomerulo nephritis (RPGN). He presented to the emergency department (ED) with fever, loose stools, worsening dyspnea on exertion, cough, conjunctival congestion, and bilateral lower limb pain of 1-week duration while on hemodialysis (HD). He was started on intravenous (IV) antibiotics, suspecting a catheter-related septicemia. Stool and sputum examination revealed strongyloid infection. The patient was treated with Albendazole, Ivermectin, empirical antibiotics, and tapering and stopping of steroids. Symptoms improved and the patient was discharged in stable condition. The second case is a known case of systemic hypertension and biopsy-proven IgAN on maintenance steroids, with recently detected diabetes mellitus. He presented to the ED with tiredness, fever, cough, dyspnea, and occasional hemoptysis of 1-week duration. On evaluation, he had maculopapular rash over the chest and abdomen, along with hypoxia requiring oxygen support, thrombocytopenia, and worsening renal function. He was initially started on IV antibiotics, suspecting a lower respiratory tract infection with sepsis. Bronchoalveolar lavage (BAL) cytology yielded strogyloid larvae. The patient received ivermectin along with empirical IV antibiotics and supportive treatment but succumbed to the infection. These case reports signify the need for an active search for opportunistic infections in patients who are on continuous immunosuppressive therapy.

Keywords: Strongyloidiasis, Immunocompromised, Steroid, Renal disease

INTRODUCTION

Strongyloidiasis is caused by a nematode *Strongyloides Stercoralis*. It is endemic in tropical and subtropical regions, with an overall prevalence of more than 30%.[1] Southeast Asia, Western Pacific regions, and Africa account for three-fourths of cases globally.[2] Lack of sanitation facilities is an important risk factor.[3] The infective filariform larva enters the human body via skin penetration and proliferates in the intestine to produce gastrointestinal (GI) symptoms.[4] Most infected patients are asymptomatic.[5] In case of an immunocompromised host, they can cause disseminated infection.[6] The larva is also unique in that it can cause internal reinfection and autoinfection, which makes it difficult to eliminate in patients with concomitant immunosuppressive therapy. Risk factors include infections like human immuno-deficiency virus (HIV) and human T-lymphotropic virus (HTLV), malignancy, hypogammaglobulinemia, congenital immunodeficiency, and alcoholism or malnutrition.[7,8] Medical interventions like corticosteroids,[6] cytotoxic drugs, tumor necrosis factor (TNF)-alpha

inhibitors, solid organ transplants, and hemopoietic stem cell transplants. We report two cases of disseminated strongyloidiasis in patients who were started on systemic steroids for rapidly progressive renal failure (RPRF) and IgA nephropathy (IgAN).

CASE REPORT

Case 1

The patient is a known case of diabetes mellitus for the past 10 years with concomitant diabetic peripheral neuropathy and diabetic retinopathy. He has been hypertensive for the past 10 years. He has a history of coronary artery disease status post-percutaneous coronary intervention (PCI) in 2021. His baseline creatine was 1.2 mg/dl in March 2021. On follow-up, there was a rapidly increasing creatine level of 1.7 mg/dl in November 2021, 3.2 mg/dl in November 2022, and 4.3 mg/dl in December 2022. He had a rapidly worsening glomerular filtration rate (GFR) and became dialysis-dependent by the end of December 2022. In view of the clinical picture suggestive of RPRF, a renal biopsy was performed, and it showed diffuse proliferative glomerulonephritis (DPGN) with 30% crescents. A diagnosis of RPGN was made, and he was started on methylprednisolone 125 mg for 3 days, followed by oral prednisolone 60 mg daily. He continued to be dialysis-dependent on follow-up. The steroid dose was gradually tapered to 40 mg daily and maintained at that dose. Two months into starting steroids, the patient presented to the ED with a fever, loss of appetite, and loose stools lasting one week. On examination, the patient was febrile and toxic, with a cough and characteristic rash over the abdomen, conjunctival congestion of the right eye, and pain and swelling of both lower limbs. As the patient was on hemodialysis via a cuffed jugular catheter, the possibility of a catheter-related bloodstream infection was initially considered, and the patient was started on Meropenem and Vancomycin. Blood cultures and routine labs were sent.

On detailed history-taking, the patient reported that he had black stools and a cough with blackish sputum. The examination also revealed rashes over the abdomen. The bilateral lower limbs were swollen, edematous, and tender. The possibility of deep vein thrombosis (DVT) or cellulitis was considered, and venous doppler was done, but the results were normal. A stool routine and sputum sample were sent for examination. Initial labs revealed normal cell counts with an elevated C-reactive protein (CRP). Other routine labs were within normal limits. The patient's symptoms didn't subside after starting antibiotics, with fever, fatigue, loose stools, and conjunctival congestion persisting. Blood culture was negative, but a routine stool exam revealed stongyloid larvae in the sample (Figure 1). Subsequently, the sputum sample also showed strongyloid larvae. Computed tomography (CT) thorax and abdomen revealed diffuse ground glass opacities in bilateral lung parenchyma, likely infective etiology, and long segment bowel wall thickening and oedema of the colon-likely colitis. The patient was given a stat dose of Albendazole 400 mg along with Ivermectin 12 mg for 2 days. A repeat 2-day course of ivermectin was given on day 14. The steroid was gradually tapered and stopped. With these measures, the patient's symptoms improved dramatically. All the symptoms, including loose stools and cough improved. The conjunctival congestion, lower limb pain, and swelling also improved with treatment. Contact precautions were taken. Caretakers were asked to use gloves, and limited visitors were allowed for patient. The patient was discharged in a stable state.

Figure 1: Strongyloid larvae in stool.

Case 2

The patient is an ex-smoker with a history of hypertension for the past 5 years. Renal dysfunction was detected one and a half years ago with a baseline creatine level of 1.8 mg/dl. In view of worsening renal function, a renal biopsy was done on 30 September 2022, which was reported as IgA nephropathy with mesangial hypercellularity. 40% interstitial fibrosis and tubular atrophy (IFTA), and 40% glomerulosclerosis. He was started on immunosuppression and maintained on oral steroids (Prednisolone 40 mg daily dose) from an outside hospital. The patient presented with generalized tiredness, fatigue, fever, cough, and dyspnea on exertion, with occasional hemoptysis of 1-week duration. On examination, the patient was febrile, tachypeic with a respiratory rate of 30/min, and had papular rash over the abdomen. Back and chest examinations revealed bilateral crackles and wheeze with oxygen saturation below 90% in room air. Routine labs yielded normal counts with thrombocytopenia. High-resolution computed tomography (HRCT) showed features suggestive of ILD, emphysematous changes, and ground glassing. Urine culture revealed enterobactor species. He was started on supplemental O_2, injection Piperacillin, Azithromycin, Oseltamivir and other supportive medications. The stress dose of steroids was continued.

His renal function, which was 1.6 mg/dl at baseline, worsened to 2.3 mg/dl. The respiratory symptoms persisted despite treatment, and the patient developed new-onset malena and hemoglobin drop during the course of treatment. An esophago-gastro-duodenoscopy (OGD) and

bronchoscopy with BAL were done. OGD showed evidence of severe pangastritis and duodenitis with hemorrhagic spots and mucosal friability. BAL revealed alveolar hemorrhage and cytology yielded stronglyloid larvae (Figure 2). The patient was started on Ivermectin 12 mg OD. However, the patient's general condition deteriorated. The patient had worsening hypoxia and hypotension, was intubated and started on Vancomycin, Colistin, Cotrimoxazole, Meropenem, and Noradrenaline support. But despite optimal treatment, the patient expired.

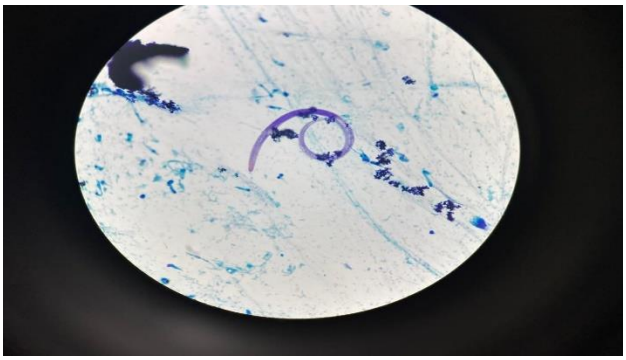

Figure 2: Strongyloid larva in BAL sample.

DISCUSSION

Disseminated strongyloidiasis is a severe form of strongyloid infection that occurs in a minority of cases of strongyloid infection and is usually associated with immunosuppression. Disseminated infections can involve the liver, pancreas, gall bladder, ovaries, mesenteric lymph nodes, diaphragm, heart, and skeletal muscle.[3] Larvae are present in large quantities in the intestinal lumen and cause non-specific abdominal pain, watery diarrhoea, nausea, and vomiting. Colitis may be associated with this, causing occult or gross blood in stools, as seen in our patients. Abdominal radiography in such cases shows thickened bowel loops with the absence of mechanical obstruction, as seen in the first case. Respiratory symptoms reflect the irritative responses caused by the passage of larvae, and there may be associated fever, dyspnea, cough, chest pain, or hemoptysis, as seen in both cases.[9] The chest radiograph shows bilateral focal interstitial infiltrates reflecting alveolar haemorrhage, which was also seen in both cases, with the second case demonstrating alveolar haemorrhage in BAL.

Dermatological manifestations include larva currens over the lower trunck, thighs, and buttocks. Periumbilical purpura is a pathognomonic manifestation of disseminated disease.[10] Our patients had an erythematous rash over their lower abdomen. Migration of larvae may facilitate the entry of organisms into the systemic circulation, which presents as pneumonia, meningitis, and sepsis.[11] Features of septicaemia were present in the second patient, who had a bad outcome. Direct infiltration of strongyloid larvae into the conjunctiva is rare. But there are case reports of reactive arthritis associated with strongyloid infection, which is characterized by arthritis and uveitis.[12] Our first patient at presentation had bilateral symmetrical arthritis involving multiple joints of both lower limbs and associated conjunctival congestion and rash. All these findings point towards underlying reactive arthritis in our patient. Treatment of severe infection is with ivermectin 200 mcg/kg/day for two weeks, along with an empirical antibiotic for gram-negative enteric bacteria. In the first case, we gave two doses of ivermectin (12 mg) two weeks apart, along with a single dose of albendazole and empirical meropenem for gram negative coverage and de-escalation of oral steroids.[13] Our second patient was started on 12 mg of ivermectin with antibiotics to cover for sepsis, including vancomycin, meropenem, colistin, and cotrimoxazole, in view of severe septic shock.

CONCLUSION

Another practical area of concern was the isolation and infection control strategy to be adopted. CDC guidelines suggest the use of standard contact precautions like gloves and thorough hand washing, and the same was conveyed to the patient's care takers. Summarizing, this case report signifies the need for an active search for opportunistic infections in patients who are on continuous immunosuppressive therapy. The treating doctors should be alert regarding the possibility of disseminated parasitic infections in addition to bacterial, fungal, and viral infections while starting the patients on long-term steroids.

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