Case Report

Strongyloides stercoralis hyperinfection syndrome in patient with non-proliferative glomerulopathy

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Abstract

Strongyolides stercoralis commonly causes chronic, asymptomatic infection but can cause more disastrous type of infection in immunosuppressed patient. Out of many predisposing factors for *Strongyloides* hyperinfection, regular intake of corticosteroids is a major risk factor. We are presenting a case of *Strongyloides* hyperinfection syndrome in a 66 years old male patient, a known case of non-proliferative glomerulopathy, presented at Tribhuvan University Teaching Hospital, with swollen limbs, anemia and history of self-recovered diarrhea. His condition got exacerbated and required Intensive Care Unit stay. Despite all the efforts being made for his recovery, he died after 30 days of stay in the hospital.

Keywords: Hyperinfection, non-proliferative glomerulopathy, *Strongyloides*

Introduction

Strongyloides stercoralis is an intestinal nematode which is ubiquitous in distribution[1]. Infection of *Strongyloides* is particularly unique with its potential for autoinfection and its frequency in patient taking immunosuppressant and immunocompromised patient where its disease manifestation can be too severe and lethal than in other patient[2]. It is mainly noted for its chronic, asymptomatic infection. However, recent increase in the incidence of patients with immunodeficiency and use of immunosuppressive therapy have resulted in high occurrence of hyper infection with wide range of symptoms and abnormalities, mainly represented as pneumonitis, pulmonary fibrosis, respiratory failure, diarrhea, malabsorption, anemia and other complications[3,4]. There are many predisposing factors of hyperinfection syndromes, viz., corticosteroids therapy, malignancies, transplantation, malnutrition, etc; among them corticosteroids therapy seems to be a major concern for many clinicians[1].

Case presentation

On routine day to day work in microbiology laboratory of Tribhuvan University Teaching Hospital (TUTH), we accidently detected larvae in gram's stained smear of a sputum sample sent to our laboratory for bacterial culture and gram's stain. As soon as we detected the larvae, we notified the concerned Medical officer for sending patient's sputum and stool sample,after examined detail structure in microscope confirmed as larvae of *Strongyloides stercoralis* and due to the peculiarity of the case we followed the patient.

A 66 year old patient, a known case of Hypertensive Nephrotic Syndrome(non-proliferative glomerulopathy) admitted to TUTH, presented with swollen limbs, decreased urine output, sign of anemia, chest pain and the history of self-recovered diarrhea. At the time of admission, his hematological tests showed normal result except abnormally low hemoglobin level (8 mg/dL). Renal function tests showed normal level of blood creatinine and BUN but low level of sodium (126mEq/l)

suggesting hyponatremia and urinary albumin was 3+. After admission, he was pulsed with hydrocortisone 100mg IV twice daily. His repeated peripheral blood smear showed normocytic normochromic RBCs, Iron profile showed Iron level =110µg/dl, TIBC=173µg/dl and ferritin >1000ng/ml; liver function test showed normal level of bilirubin, while albumin 29gm/l , ALT/AST=80/117 U/L. Stool examination showed no parasite but was positive for occult blood with pus cells 10-12/hpf and 8-10 RBCs/hpf, urine analysis showed albumin (3+) with pus cells (2-4/hpf), granular cast (1-2/hpf) and calcium oxalate crystal (plenty/hpf). On 8th day of admission, patient started showing the symptoms of diarrhea with vomiting. His stool examination was positive for occult blood but still no any parasite. On 10th day patient felt shortness of breath, chest pain and was coughing. On 11th day of admission, heavy load of parasitic larvae were noted in his sputum gram stain smear. The smear also showed plenty of pus cells with predominance of gram-negative bacteria and budding yeast cells. The sample was processed to isolate and identify the microorganisms following American Society for Microbiology (ASM) guideline and antibiotic susceptibility testing was done by Clinical and Laboratory Standards Institute (CLSI) guideline. The larvae was later confirmed to be of *Strongyloides stercoralis* by wet mount preparation of sputum and also found in repeated stool examination. The *Strongyloides stercoralis* larvae were further confirmed by Centers for Disease Control and Prevention (CDC) using photographic image. The gram-negative bacteria were confirmed to be *Escherichia coli* and the budding yeast cells as *Candida albicans.* On the same day, his endoscopy revealed the esophageal candidiasis. Oral ivermectin 12 mg twice daily was initiated without any delay, and meropenem and fluconazole therapy was also given to the patient. His dose of hydrocortisone was tapered down to 50 mg IV twice daily. Meanwhile, the patient did not improve and his condition got exacerbated, developed shortness of breath, his oxygen saturation became unsteady, and also showed the recurrent episodes of hypotension, thus requiring shifting to Intensive Care Unit. On 23rd day patient's both stool and sputum samples were negative for *Strongyloides* larvae but his sputum sample repeatedly showed plenty of pus cells with gram-negative bacteria and yeast cells. Patient was continued with meropenem, and amikacin was also started. Due to his high urinary albumin and hyporensium, his hydrocortisone dose was increased 100 mg TDS. Despite all the efforts being made, the patient died due to sudden cardiovascular arrest on 30th day of hospital admission.

Discussion

Intestinal nematodes like *Strongyloides stercoralis* are widely distributed, mainly in developing counties like ours. Sometimes infection can remain quiescent over decades becoming apparent while on immunosuppressant leading to hyperinfection/disseminated infection. This exacerbates the gastrointestinal and pulmonary symptoms and hence increased numbers of larvae may be detected in stool and/or sputum. In our case, the patient who was a farmer dealing each day in possible sources of infection, had a history of self-recovered diarrhea which could be due to *Strongyloides* infection converted to dormant state[5]. Diagnosis of *Strongyloides* hyper-infection can be easily made by microscopic examination of sputum and stool with history of eosinophilia but corticosteroid therapy can result in low eosinophil count as seen in our case[6] . Gram-negative bacterial septicemia or bacterial pneumonia are common in patient with *Strongyloides* hyper-infection as larvae may carry the bacteria to inner organs during its life cycle[5,7]. This could further play a crucial role in patient degradation. Patient of nephrotic syndrome usually are in critical condition and are more susceptible to infection due to a number of reasons,[8] thus *Strongyloides* hyper-infection can further aggravate the condition of patient leading to the need of intensive care and also may result in death (mortality rate is up to 87%)[9]. Corticosteroids therapy is the major predisposing factor of hyper-infection, so patient under the therapy of these immunosuppressive drugs should be correctly monitored for *Strongyloides* infection. The diagnosis made by random microscopical examination of the stool may not be as sensitive (33%) as examining duodenal aspirate (76%) or using specific antibody ELISA (>90%), but the diagnosis in hyper infection patient is fairly easy because of high number of larvae in sputum, stool and other body fluids. These days oral ivermectin at 200µg/kg is the drug of choice while albendazole/thiabendazole is given as second line treatment. In hyper-infection syndrome, treatment should be started immediately and usually ivermectin be given for 2 weeks or often until a serial negative stool examination of full two weeks.

Conclusion

Strongyloides hyperinfection is a major concern for patient on immunosuppressive drugs and can cause

serious health issue, so early detection system of *Strongyloides* infection and proper management of such patient is needed.

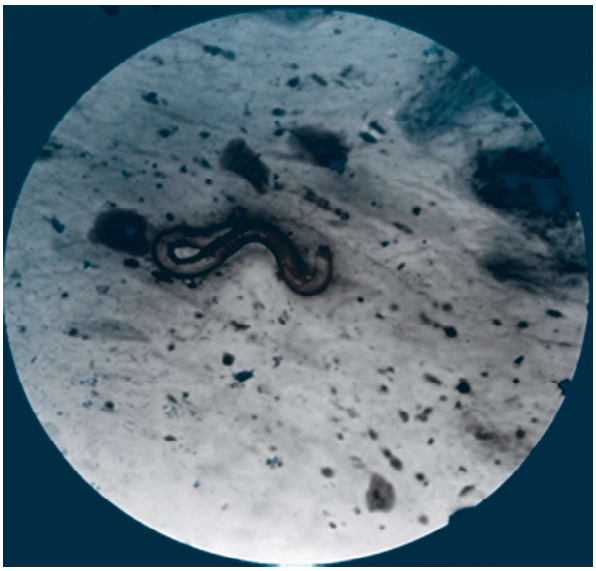

Figure 1: *Strongyloides's* Larvae in Gram's stain slide of sputum Sample, 400X magnifications

Figure 2: *Stongyloides's* larvae in wet mount preparation of sputum sample, 400X magnifications

Figure 3 *Strongyloides's* larvae in wet mount preparation of stool sample, 400X magnifications

Conflict of interest: None declared

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