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Case Study

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Diagnostic Difficulty in Strongyloides Hyperinfection along with Bateremia -A Case Report

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A B S T R A C T

The spectrum of clinical presentation of Strongyloidiasis is wide. From asymptomatic to generalized symptoms can be a presenting feature. This is an endemic disease in tropical and subtropical countries. Still diagnosis can be missed in the earlier stages ending up in hyperinfection which is the dangerous turn of this infection. Since this infection is far wider in prevalence and there is a huge population of diabetic patients there has to be more awareness of this neglected infection. Here we present an interesting case of stongyloides from Chennai, south India who was admitted with Type II Diabetes, Diabetic foot with MRSA bacteremia and later on found out to be a chronic case of strongyloides infection in whom the route of entry of the infection must have been the diabetic ulcer. This case study presents the diagnostic difficulty of strongyloides infection when it coexists rarely with MRSA bacteremia.

Introduction

The vague and varying clinical symptoms of strongyloidiasis can be the cause for under diagnosis of this neglected parasitic infection. The presentation of the disease mainly depends on the immune system of the patient. This is an endemic disease in tropical and subtropical countries. Still diagnosis can be missed in the earlier stages ending up in hyperinfection which is the dangerous turn of this infection (Singh *et al.*, 2021). The spectrum of presentation of the infection is wide. Right from asymptomatic to generalized symptoms like heartburns, loose stools and even constipation can be a presenting feature. Furthermore immunosuppresion can lead to hyperinfection (Paul *et al.*, 2020). This infection is far wider in prevalence in our country along with a huge population of diabetic patients. As stool examination can end up negative despite the disease there has to be more awareness of this neglected infection (Jose A Gonzales Zamora, 2017). Treatment when started earlier can be life saving for these patients. Here we present an interesting case of stongyloides from

Chennai, south India who was admitted in hospital with Type II Diabetes, Diabetic foot with MRSA bacteremia and on investigation found out to be achronic case of strongyloides infection. About the diagnostic difficulty of strongyloides infection when it coexists rarely MRSA bacteremia.

Case Report

A female patient 56 years old was brought to our hospital in Chennai, South India. She complained primarily of fever, weakness for past 4 days and also of a chronic ulcer of left foot which is being treated for past eight months. A complaint of vomiting 3 to 4 episodes for the past two days was also present. She is a known type 2 diabetic patient on oral antidiabetic. No other comorbidities. While eliciting the history it was revealed that the patient had on and off loose stools for the past six months. She has been having watery stools without any abdominal pain or vomiting intermittently for six months. She was being treated at the nearby clinics on such episodes and got relieved of it temporarily. There was a complaint of loss of appetite and mild abdominal pain too. She also complained of bloated feeling but no diarrhoea. She did not give any history of itching, rashes or pulmonary symptoms. On examination abdomen was soft. No abdominal distension or tenderness.

Examination of other systems were also normal. Her BP was 100/70 and pulse rate was 115/min. she was admitted in medical ward. The preliminary investigations showed the total WBC count was 21,940. The differential count showed striking eosinophilia with 44%. Hb was 9.2 mg /dl. Ultrasonography of abdomen was normal. The next day the patient's blood culture turned positive with growth of GPC in clusters. The swab from the foot ulcer also was positive for growth of GPC in clusters. Emperically antibiotic was started for the GPC bacteremia for which the primary focus must have been the foot ulcer. The final culture reports came as MRSA growth both in blood and diabetic ulcer cultures both with the same antibiotic sensitivity pattern. The patient complained of loose stools again after two days of admission. The stool was watery and greenish in color. The wet mount showed many larvae. They were alive and motile. The morphology was matching the rhabditiform larvae of *Strongyloides stercoralis*. Meanwhile the patient's general condition worsened and she was shifted to ICU.

Diagnosis

MRSA septicemia, type II diabetes mellitus with diabetic ulcer of left foot and chronic Strongyloidiasis

Therapy

The patient was treated with intravenous fluids,and Intravenous antibiotic vancomycin and oral antidiabetics. The diarrhoea was treated with intravenous ciprofloxacin and metrogyl. Following the detection of strogyloides larvae in stool she was treated with Ivermectin and Albendazole. On third day of treatment the patient developed hypoxia and shifted to intensive care unit for oxygen support. When the general condition stabilized she was shifted to another medical facility nearby to their hometown as per her request.

Results and Discussion

This patient is a resident of rural area near Chennai. Working in soil is a part of her lifestyle. She comes in contact with soil regularly. This provides the clue for the most probable route of entry of the parasite initially. As per the study of Nagayasu *et al.,* the humans and animals like dogs and cats are the hosts of the parasite and can contaminate the soil with the larvae and infect a new host (Nagayasu *et al.,* 2017). People who come in contact with soil are more at risk of this infection (Saeidinia *et al.,* 2016).

She is a known diabetic patient on oral antidiabetic medicines for 5 years. She developed diabetic ulcer in left foot six months back. As per Gill *et al.*, (2004) the clinical features are quiet the same in stongyliodiasis in diabetic patients too (Gill *et al.*,

2004). At the same time those who present with diabetic foot are at higher risk of obtaining the strongyloides infection. Kalantari *et al.,* showed the prevalence of strongyloidiasis is more in patients with diabetic foot. So this patient might have presumably ended up with strongyloidosis because of the presence of diabetic foot. The prevalence rate of Strongyloides sp. infection is higher in patients with diabetic foot compared with non-diabetic foot case (Kalantari *et al.*,2017).

There is a strong association of eosinophilia with strongyloides infection (Sharifdini *et al.,* 2018). Our patient's eosinophils were 44 % in differential count which gave a strong hint for parasitic infection and helped in promptly starting Albendazole.

Meanwhile in the blood culture and culture of the diabetic ulcer there was growth of GPC later on identified as MRSA. For this bacteremia IV vancomycin was started and the patient was primarily diagnosed to be a case of MRSA sepsis. The focus of infection was identified as the diabetic ulcer which was infected with the same organism. But on the second day the patient developed watery diarrhea.

Strongyloides infection can cause malabsorption, diarrhea, colitis and GI perforation. If the patients are immunosuppressed they can further develop hyperinfection. As per Sharifdini *et al.,* (2018) this condition is manifested as watery diarrhea. Even bloody diarrhea can occur. One of the major complaint of our pateint was diarrhea on and off for past 6 months. After getting admitted our patient developed diarrhea which was watery and with the routine stool examination it was immediately diagnosed a strongyloides infection. Soon Ivermectin was added in therapy too. Diagnosis of strongyloides infection can be largely missed if we depend on single stool examination as per Dahal *et al.,* (2017). This study says ELISA is two times more sensitive than stool examination. In this patient it was successful in the first stool examination itself. But we cannot expect the same in other patients.

Initially she was hemodynamically stable. But on third day she developed hypoxia. Probably it was due to the hyperinfection of strongyloides infection. She was given oxygen support. Eventually the oxygen saturation was normalized. Unfortunately her further development could not be followed as she had to be shifted to a medical centre near her hometown as per her request.

The MRSA sepsis was misleading in this case initially. The gram negative bacilli of GI flora can penetrate the intestinal mucosa and cause bacteremia and disseminated infection (Vijayakumar *et al.,* 2019). But MRSA is not a part of GI flora. So MRSA sepsis and strongyloides are two different infections which cannot be commonly seen together. This coinfection in our patient is a rare presentation indeed.

If the patient had not developed watery diarrhea or if the strongyloides larvae were not detected in stool examination the chronic infection of strongyloides infection could have been missed and the life threatening development of hyperinfection would have cost her life. Fortunately the strogyloides infection was diagnosed on time because of high suspicion of parasistic infection in this patient which was due to eosinophilia.

As there is a constant increase in the number of diabetic patients worldwide the parasitic infections are to be expected to rise due to the immunocompromised state of the diabetic patients. So, regular investigations for parasitic infections should be made mandatory. As the infections like strogyloidiasis can develop into hyperinfection and easily missed in single stool examination ELISA testing can be suggested in immuncompromised individuals at regular intervals. The diabetic patients with diabetic foot are to be given special attention regarding the strongyloidiasis. There is a chance of parasitic infection in a patient presenting with other bacteremia as well. So it the suspicion of parasitic infection should never be neglected in diabetic patients.

Fig.1 Saline mount of *Strongyloides stercoralis* larva

Fig.2 Iodine mount-*Strongyloides strecolralis* larva

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