

Pulmonary Strongyloidiasis - A case report

Melody Baruah, Ishani Bora, Annie Bakorlin Khyriem, Wihiwot Valarie Lyngdoh

Department of Microbiology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, Meghalaya, India

Correspondence to: Annie Bakorlin Khyriem, E-mail anniebk@rediffmail.com

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ABSTRACT

Strongyloides stercoralis is an intestinal nematode with both free-living and parasitic stages and is common in the tropics. Chronic infection may lead to cutaneous, gastrointestinal, or pulmonary symptoms. We present the case of a 40-year-old male farmer, with on and off loose motions, productive cough, and loss of weight and was admitted with the provisional diagnosis of pulmonary tuberculosis. Rhabditiform larva of *S. stercoralis* was discovered in the sputum which was sent for screening of acid-fast bacilli. Stool examination was not done. There was no history suggestive of immunocompromised status and the screening test for HIV antibody was negative. Sputum culture showed growth of *Escherichia coli*. Other laboratory parameters were within normal limits. His chest X-ray revealed bilateral diffuse infiltrates. He was thereby diagnosed to be a case of pulmonary strongyloidiasis, but his condition deteriorated, and he expired before institution of any treatment. Although a potentially lethal opportunistic infection, strongyloidiasis is amenable to treatment with anthelmintics if detected in time. Hence, clinical suspicion with timely diagnosis and aggressive treatment becomes mandatory.

KEY WORDS: Pulmonary Strongyloidiasis; Rhabditiform; *Strongyloides stercoralis*

INTRODUCTION


Strongyloides stercoralis, an intestinal nematode parasite, is endemic/ubiquitous in tropical and subtropical countries.^[1,2] Infection usually results in asymptomatic chronic disease of the gastrointestinal tract.^[3] Hyperinfection denotes autoinfection with accelerated gastrointestinal and pulmonary symptoms. Pulmonary infection may manifest as asthma, chronic bronchitis, hemoptysis, pulmonary infiltrates,^[4] and often missed where pulmonary tuberculosis is common. Disseminated infection refers to the widespread involvement of organs not usually involved in the normal cycle of the parasite.^[2,5] Predisposing risk factors

associated with strongyloidiasis include immunosuppressive therapy, malignancy, transplants, diabetes, alcoholism, hypochlorhydria, tuberculosis, malnourishment, and chronic obstructive pulmonary disease.

A similar case of pulmonary strongyloides is reported by Jayaprakash et al. in 2009 in an immunocompetent female.^[4] Here, we report a case of pulmonary strongyloides in a patient who had cough and fever with loss of weight for 6 months.

CASE REPORT

A 40-year-old male, farmer by occupation, was brought to the emergency department with complaints of acute retention of urine of 1-day duration. The patient also had on and off loose motions (10-20 motions/day), productive cough, loss of weight, and fever for the past 6 months. The patient was not a known diabetic or hypertensive and was not on any medication in the recent past or at the time of admission.

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On examination, the patient was pale, afebrile, and severely malnourished. His blood pressure was 120/50 mmHg, pulse rate 80/min, and respiratory rate 20/min. Abdominal examination was unremarkable. No abnormality of the cardiovascular system and central nervous system was noted. The respiratory system showed crepitations in both the lower lung fields. His urinary retention was relieved after a urology consultation. The chest X-ray showed bilateral diffuse infiltrates. The biochemical parameters (random blood sugar - 183 mmol/L, total serum protein - 4.5 mg/dl, albumin - 2.5 mg/dl, globulin - 1.9 mg/dl, and albumin: globulin - 1.4), liver function test (serum bilirubin - 5.6 mg/dl, direct - 2.7 mg/dl, indirect - 2.9 mg/dl, serum glutamic oxaloacetic transaminase - 32 IU/L, and serum glutamate-pyruvate transaminase - 22 IU/L), and kidney function test (serum urea - 27 mg/dl, creatinine - 0.6 mg/dl, K - 2.8 mmol/L, Na - 135 mmol/L, Ca - 0.93 mmol/L, and Cl - 99 mmol/L) were within normal limits. Peripheral blood picture revealed normocytic normochromic anemia (hemoglobin - 9.4 g/dl, red blood cells (RBC) - 3.22×10^6 , white blood cells (WBC) - 13,000, platelets - 160×10^3 , packed cell volume - 27%, mean corpuscular volume - 84 fl, mean corpuscular hemoglobin - 29 pg, mean corpuscular hemoglobin concentration - 34%, and erythrocytes sedimentation velocity or rate - 2 mm/h). RE urine showed RBC - 25-30/hpf, WBC - 3-6/h pf, and epithelial cells - 1-2/h pf. Thyroid function tests were within normal limits (T4 - 3.88 ug/dl, T3 - 6.46 ng/ml, and thyroid-stimulating hormone - 0.01 uIU/dl). His echocardiography was within normal limits. Screening test for HIV antibody was negative, but the patient was positive for HBsAg. Based on history and chest X-ray findings, the patient was provisionally diagnosed to be a case of pulmonary tuberculosis. On day 2 of admission, sputum sample was sent for culture and acid-fast stain (AFB) staining, where numerous rhabditiform larvae of strongyloides (2-4/lpf) were observed, but acid-fast bacilli were not detected (Figures 1-3). However, no larva was demonstrated in urine or blood, and stool examination was not possible as the patient did not pass stool for the duration he was admitted in the hospital. Urine for AFB was negative. Blood culture showed no growth after 7 days of aerobic incubation. Sputum culture showed growth of *Escherichia coli*. The patient showed a rapid clinical deterioration and subsequently treatment could not be instituted as the patient had a cardiac arrest and could not be resuscitated and postmortem was not performed.

DISCUSSION

S. stercoralis, an intestinal nematode, is found worldwide and affects approximately 30-100 million people.^[6] It is endemic in the tropical and subtropical areas of the world such as Southeast Asia, Latin America, Sub-Saharan Africa, and Southeastern USA.^[1] *S. stercoralis* is a unique parasite as it can complete its life cycle within the human host

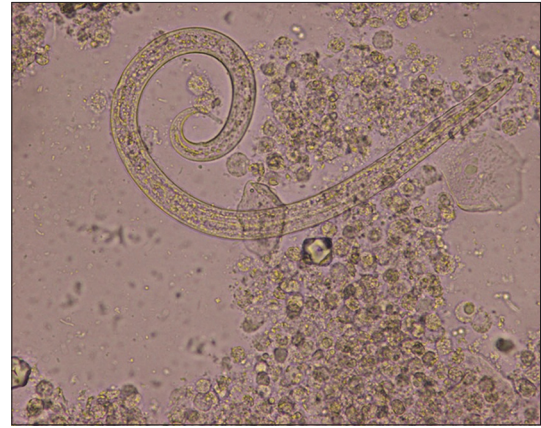


Figure 1: Wet mount of sputum showing Rhabditiform Larva

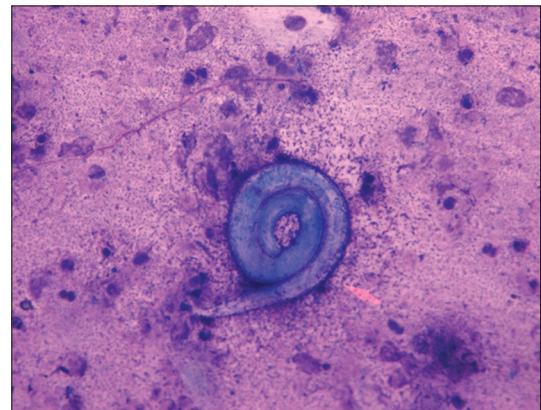


Figure 2: Leishman's staining of sputum showing rhabditiform larvae

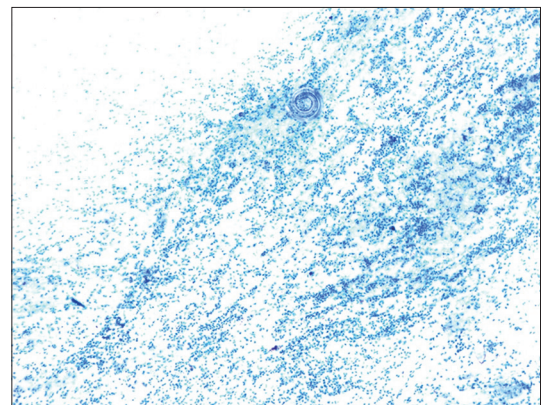


Figure 3: Acid fast staining of sputum showing Rhabditiform Larva

wherein autoinfection can occur.^[6] Risk factors such as low socioeconomic status, alcoholism, pre-existing lung lesions, malnutrition, malignancies, and occupations such as farming have been associated with higher prevalence of *S. stercoralis*.^[7] The clinical syndromes of *S. stercoralis* encompass acute strongyloidiasis, chronic strongyloidiasis, hyperinfection, and disseminated infection.^[7]

Pulmonary strongyloidiasis is a common manifestation of strongyloides hyperinfection syndrome, and the detection

of increased number of larva in sputum is the hallmark of hyperinfection as seen with the case reported here.^[7]

Blood counts performed during hyperinfection may show eosinophilia, but more often show a suppressed eosinophil count^[7] and the absence of eosinophilia does not exclude diagnosis though it may be considered a poor prognostic sign.

Symptoms of pulmonary strongyloidiasis include dyspnea, wheezing, cough, and hemoptysis and these symptoms are also seen in bronchial asthma as well as in pulmonary tuberculosis.^[8] Pulmonary tuberculosis in India is not uncommon and most often is entertained as the primary diagnosis pending investigations. Hence, a combination of chronic lung disease such as unresponsive asthma or unexplained lung infiltrates together with gastrointestinal symptoms may be suggestive of strongyloidiasis.^[6]

Rarely, the radiographic findings classical of the etiological agent and most potential etiologies have overlapping clinical and radiographic appearances.^[9]

The diagnosis of pulmonary strongyloidiasis is often delayed and missed due to nonspecific signs, symptoms, and radiographic appearances.

Definitive diagnosis is dependent on demonstration of *S. stercoralis* larvae from sputum, of which Gram stain is simple and useful screening test.^[6] Other staining methods such as Papanicolaou are also helpful.

Serological tests such as enzyme-linked immunosorbent assay are also important adjunct for detection of antibodies with a reported sensitivity of 95%^[5] in cases having the infection.

In the case reported here, the patient presented with symptoms of pulmonary infection with associated gastrointestinal symptoms. A sputum for AFB was done to exclude pulmonary tuberculosis led to the detection of larvae of *S. stercoralis*, wherein a diagnosis of pulmonary strongyloidiasis was made. Sputum culture yielded *E. coli* which could be probably due to migration of the larvae to the lungs, wherein the organism was carried over. Although we were not able to demonstrate the larvae in stool as the patient was unable to provide a sample and expired soon afterward.

Ivermectin, thiabendazole, or albendazole are drugs commonly used for the treatment of strongyloidiasis. Our patient, however, expired before treatment could be initiated and this outcome highlights some important points. The diagnosis of pulmonary strongyloidiasis is often delayed,

overlooked, or missed due to nonspecific symptoms. This case illustrates the need to suspect pulmonary strongyloidiasis even in non-endemic areas, as high mortality rates have been reported in disseminated infection^[6].

CONCLUSION

Although a potentially lethal opportunistic infection, strongyloidiasis is amenable to treatment with anthelmintics if detected in time. Hence, clinical suspicion with timely diagnosis and aggressive treatment becomes mandatory.

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