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Strongyloides Stercoralis in Systemic Lupus Erythematosus: A Fatal Encounter

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Abstract: ***Strongyloides stercoralis, a nematode which is also known as Threadworm is the cause of Strongyloidiasis, which is a parasitic disease. Tropical and subtropical climates such as Southeast Asia are where it is endemic. When an organism auto - infects, it might continue to infect the host for a long time. When present, symptoms lack specificity and may initially result in a wrong diagnosis, especially if the patient also has co - existing diseases. Patients who have immunosuppressive conditions are more susceptible to Strongyloides hyperinfectionsyndrome (SHS), in which the parasite multiplies and spreads quickly within the host. SHS is typically lethal if neglected. However, any delay in diagnosis and treatment may results strongyloidiasis and the hyperinfection syndrome's non - specific presentation. Here we present a case of 34 years female patient with SHS who has a history of SLE, Lupus nephritis and on steroids who presented with generalised weakness, pain abdomen, multiple episodes of vomiting, shortness of breath and altered sensorium. Identification of strongyloides stercoralis larvae in wet mount microscopic examination of patient's BAL culture can be observed in this case.***

Keywords: Systemic lupus erythematosus, Strongyloides Stercoralis, Bronchoalveolar lavage

1. Introduction

An autoimmune condition called systemic lupus erythematosus creates flare - ups that might be fatal. All bodily systems are impacted by the condition, which can appear in varying degrees of severity. Sir Osler hypothesised that the condition had a pulmonary component in 1904 [1]. Since then, these pleuropulmonary symptoms have been extensively documented in the literature, involving 50–70% of patients. Even while lung involvement is common in SLE patients, it frequently develops as a result of other organ presentations or as a side effect of medications [2]. When corticosteroids are used to treat SLE patients, especially those who are going through a flare - up, it impairs their immune systems and increases their vulnerability to parasite, bacterial, and fungal infections. Strongyloides stercoralis is one such infection that is widespread in tropical and subtropical areas. Within its human host, this parasite completes its asexual life cycle. If left untreated, it may result in a hyperinfection syndrome (HS), which is characterised by recurrent infections that are chronic in nature. This hyperinfection worsens symptoms, especially those that impact the gastrointestinal and respiratory systems [3]. Because of the increased stress on the pulmonary system, patients with disseminated strongyloidiasis may be more susceptible to developing this serious consequence. Patients with SLE may experience diffuse alveolar haemorrhage (DAH), which frequently results in death. Even in non - infectious instances, mortality rates for SLE patients with DAH have been reported to be as high as 70–90% [4]. However, cases were found with Pulmonary Strongyloidiasis associated with secondary bacterial infection. Here we will discuss one such case.

2. Literature Survey

The literature survey for the article "Strongyloides stercoralis in Systemic Lupus Erythematosus: A Fatal Encounter" explores the relationship between Strongyloides stercoralis infections and Systemic Lupus Erythematosus (SLE). It investigates the heightened risk of Strongyloides infections in immunocompromised SLE patients, the challenges of diagnosis, and the importance of early intervention. The survey also highlights the need for improved diagnostic methods and preventive measures in at - risk populations. Additionally, it emphasises the potential complications of immunosuppressive therapies and underscores the global public health implications of Strongyloides stercoralis infections.

3. Case Presentation

A 34 - year female, known case of SLE, lupus nephritis, on steroids in the past 4 months, presented with generalised weakness for about 2 weeks, and pain in the abdomen for about one week and had multiple episodes of vomiting for about 2 days. She had abdominal distension, sudden onset shortness of breath, and altered sensorium since last one day.

CT scan of the chest and abdomen showed patchy lung infiltrates in bilateral middle and lower zones. Ultrasound scan of the abdomen showed malrotatedectopic right kidney, with features of hydronephrosis.

Bronchoalveolar lavage was done and sent for investigations. Filmarray respiratory panel showed Escherichia coli, of 100, 000copies/ml and Klebsiella pneumoniae of 1, 00, 00, 000 copies/ml. A wet mount microscopic examination of the BAL fluid showed multiple live, motile parasitic larvae, identified as larvae of Strongyloides stercoralis. BAL culture revealed Klebsiella pneumoniae organism in significant colony counts, and subsequently, antibiotics were changed accordingly.

Patient was started on ivermectin with albendazole, and her steroids were stopped. She initially improved both clinically and radiologically, but later developed secondary sepsis and eventually succumbed to her illness.

Immunosuppressive therapy is the strongest risk factor for opportunistic infections and correlates with death during infective episodes.

The diagnosis of opportunistic infections in SLE may be overlooked, owing to the fact that SLE flares may mimic infection with fever and inflammatory syndrome, and needs special attention in patients at risk.

The prognosis of pulmonary strongyloidiasis depends on the immune status of host, the presence of secondary bacterial infections and upon early diagnosis, and prompt institution of therapy.

Figure 1: Bronchoalveolar Lavage showing Strongyloides Larvae

4. Discussion

Strongyloides has two different life cycles: a parasitic cycle in which the infective filariform larvae enter the host through unbroken skin, grow to adults, and reproduce, or an isolated free - living cycle in which the helminth lives independently in soil. In order to continue the parasite life cycle, the rhabtidiform larvae produced throughout the parasitic cycle are either excreted in the stool or re - enter the bloodstream as filariform larvae through the perianal skin or colon mucosa. S. stercoralis may live inside the host for years or even decades thanks to its auto infection cycle, which sets it apart from many other helminths [5, 6, 7, 8].

The majority of S. stercoralis infection sufferers show no symptoms. Clinical signs, when they do occur, are frequently modest and affect the bowel (abdominal discomfort, diarrhoea, constipation, nausea, and weight loss), the skin (rash and itching, particularly at larval invasion site), and the lungs (cough, tracheal irritation, wheeze, and asthma) [9, 10]. The current prevalence estimate of 3 - 100 million infected people globally is probably a considerable underestimate due to the lack of specificity of the clinical illness and the absence of suitably sensitive diagnostic testing [5, 6]. Patients who have immunosuppressive conditions are at risk for SHS. A large number of SHS instances are brought on by immunosuppressive medications and primary immunodeficiency conditions, such genetic diseases and hematologic cancers.

Corticosteroids are by far the most frequent precipitating agent among these contributory variables [6, 11]. The exact process is unknown, although theories vary from the T cell - mediated immune response being modulated to the inhibition of the eosinophilia that ordinarily develops in response to parasite infections [10, 12] Strongyloidiasis can also be diagnosed by serologic testing and the detection of antibodies to Strongyloides. Because of its practicality, aptitude for automation, and capacity to identify the presence of either an antigen or an antibody, depending on the assay, the enzyme - linked immunosorbent assay has been referred to as an efficient way of testing [13, 14]. Dipstick assays, gelatin particle agglutination, and instant hypersensitivity skin tests to Strongyloidesantigens are examples of similar testing procedures that have been reported [10, 14]. These tests, however, generally reliable, are unable to distinguish between active and prior infections and are prone to cross - reactivity with other helminthic illnesses [6, 13]. Additionally, serologic testing may produce false - negative findings in individuals who have immunosuppressed conditions or during acute infections. In these situations, tests or research that readily recognise the organism, or its antigens may be useful [6, 10, 13, 15]. Due to their high sensitivity and specificity, lack of cross - reactivity with other parasitic infections, and ability to track changes in antibody levels as time passes, luciferase immuno - precipitation system assays were recently created and have shown potential in the identification of Strongyloides - specific antibodies. This has led to a powerful way of evaluating the efficacy of treatments [13, 15, 16].

Simplified cases must be treated as usual with anti - helminth medications such ivermectin or albendazole. Moreover, it is yet uncertain whether individuals with strongyloidiasis might profit from concomitant immunosuppression treatment decrease. The majority of cases suggest regular anti - helminthic medication for a maximum of fourteen days or 2 weeks, or until stool ova and parasite samples consistently test negative [6, 9]. Immunosuppressed individuals' responses to anti - helminthic medication might vary, therefore the course of treatment for these patients is determined by the cause of their immunosuppression [10].

5. Conclusion

In patients with compromised immunity who present with an uncertain diagnosis but with clinical findings that are consistent with parasitic lung disease, an early diagnostic

bronchoscopy and lavage should be undertaken to rule out this fatal infection.

Strongyloides infection screening is being recommended for individuals with a significant past illness (including residency or travel in disease - endemic areas) who are either in an immunosuppressed condition or have to start immunosuppressive medication in order to avoid the possibility of SHS and hyperinfection [15]. A patient with an appropriate background and positive serologic results may benefit from empiric treatment, such as a 1–2 - day course of ivermectin if they are immunosuppressed or preparing to start immune - suppressive therapy despite the fact that certain tests have limitations in being unable to distinguish present from past illness [10, 13, 15].

6. Future Scope

By conducting broader epidemiological studies to assess the prevalence of Strongyloides stercoralis in patients with autoimmune diseases like SLE, especially in regions where the parasite is endemic. This can help identify high - risk populations.

Also, research and development of more sensitive and specific diagnostic tools for Strongyloides stercoralis, especially in immunosuppressed patients. This can aid in early detection and treatment.

Investigate and establish optimal treatment protocols for patients with both SLE and Strongyloides stercoralis infection. Determine the most effective anti - helminthic regimens while minimising the risk of exacerbating autoimmune conditions.

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