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Case Report
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Invasive Fungal Infection as the Initial Presentation of Systemic Lupus Erythematosus

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Abstract

Invasive fungal infections (IFI) are not frequently seen in systemic lupus erythematosus (SLE). However, when present they are very dangerous, being potentially fatal in the majority of cases. Immunosuppressive therapy is the strongest risk factor for IFI and correlates with death during infective episodes. However, IFI may reveal SLE in a patient without any precedent disease and in the absence of other causes of immunosuppression. We report a case of invasive pulmonary fungal infection (IPFI) revealing SLE. We report a new case of IFI revealing a SLE.

Key words:

Systemic lupus erythematosus; Invasive fungal infection; Corticosteroids

Introduction

As we know from the literature, infections are the second leading cause of death in systemic lupus erythematosus (SLE) patients (25%), immediately after the complications related to disease activity (26%) [1,2]. Both SLE and medications used to treat it (prednisone and immunosuppressive drugs) contribute to an increased risk of infection [3]. Although many infections are due to bacterial pathogens, invasive fungal infection (IFI) diseases has becoming a growing problem in SLE patients [2,4]. The estimated incidence of IFI among SLE patients, according to a few case series, ranged from 0.64 to 1.04%, and the mortality could be over 50% [4]. Most commonly, IFI presented early in the disease course of SLE, is associated with high disease activity or high dose of corticosteroids [2]. The lung is the most frequently involved organ in IFI. Deterioration caused by invasive pulmonary fungal infections (IPFI) is a potentially fatal complication in patients with SLE and usually the direct cause of death in SLE [5]. In fact, all known opportunistic infections have been documented in SLE, special attention has been paid to IFI due to their high mortality and severe morbidity [6,7]. Relatively few cases of IPFI which have evolved well under specific treatment have been described in SLE, and the risk factors remain incompletely explored [5]. The authors report another case of this condition in a 24-year-old man presenting with IPFI revealing SLE.

Case report

A previously healthy 24 year-old-male was admitted to the emergency department with a 4 day history of dyspnea, chest thrusts and pain, productive cough and fever. He was not on any medications. The patient appeared in acute respiratory distress. At physical examination, the patient was febrile (42°C), tachycardic (pulse of 180 per minute), tachypneic and hypoxic. Pulmonary examination revealed bilateral pulmonary rates. There were signs of respiratory distress with suprasternal retractions and respiratory rate was 40 breaths per minute. A chest radiograph showed bilateral diffuse infiltrates and pleural effusion in the right lower lobe (Figure 1).

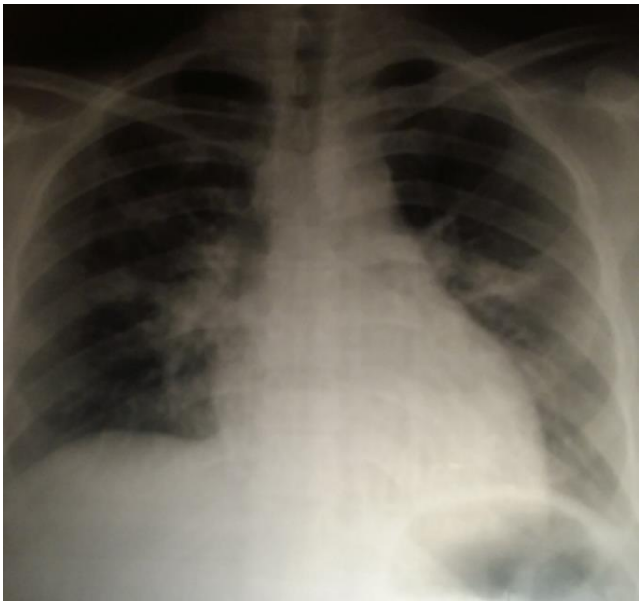

Figure 1: A chest radiograph showed bilateral diffuse infiltrates and pleural effusion in the right lower lobe.

A CT scan of the thorax revealed findings of interstitial lung disease, bilateral pleural effusion of medium abundance, pericardic effusion and some mediastinal adenopathy's (Figure 2). Cardiac ultrasound was normal. Significant laboratory results included leukocytosis (white blood cell (WBC) count 26350/µL (neutrophils 24058/µL)) (reference range WBC 3500-9000/µL, neutrophils 43-69%), decreased absolute

lymphocyte count (lymphocytes 400/μL), thrombocytopenia (platelet count 65000/μL (reference range 130 000-370,000/μL).

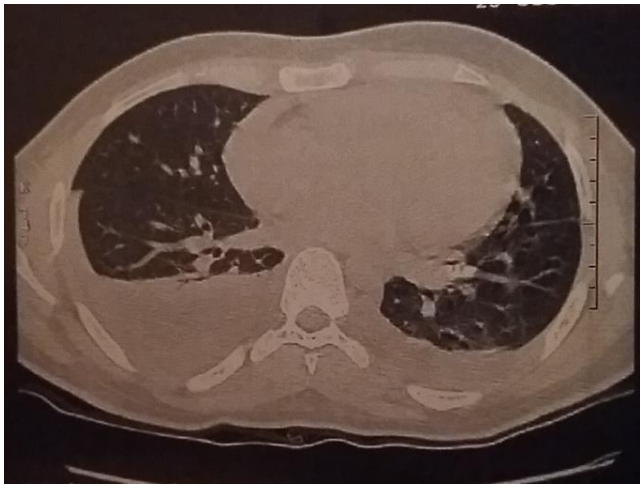

Figure 2: A CT scan of the thorax revealed findings of interstitial lung disease, bilateral pleural effusion of medium abundance and some Mediastinal adenopathy's.

Laboratory studies were compatible with a systematic inflammatory response (erythrocyte sedimentation rate [ESR] 60 mm/hour and C-reactive protein (CRP) level 342 mg/l). Blood tests revealed deranged hepatic function (aspartate aminotransferase 98 U/L (reference range 8-37 IU/L), alanine transaminase 141 IU/L (reference range 4-44 IU/L). Other findings were normal. Bacterial cultures from the blood and sputum were sterile. Mycology cultures from the blood sample and urines yielded *Candida albicans*. *Candida* serology was positive. He had a positive antinuclear antibody (ANA; 1:160 titer, fine speckled pattern), positive antibody to SSA/Ro, and a slight decrease in C3 (70 mg/dl, normal range 90-190). He was negative for antibodies to double-stranded DNA, SSB and antiphospholipids. He was seronegative for human immunodeficiency virus (HIV) and hepatitis B and C. In light of his pattern of symptoms, examination findings, and serologic data, systemic candidiasis revealing a SLE was strongly evoked with dramatic improvement in his renal, hepatic, hematological and pleuropulmonary failures. He started on 1 mg/kg of prednisone. He was initially given amoxicillin-clavulanic acid (1 g/8 h). After he was diagnosed with atypical pneumonia and the initial antibiotic treatment was changed to intravenous cefotaxime plus ciprofloxacin (500 mg/12 h). His fevers and cough did not improve with antibiotics. Therapy with fluconazole (400 mg/24 h) given orally daily was added to the existing therapy. The evolution was good after two days of antifungal treatment, marked by apyrexia and the disappearance of dyspnea. The pulmonary chest X-ray in control was normal. He was discharged home 3 days later on prednisone 30 mg and fluconazole twice daily.

Discussion

Superficial fungal infection (oral thrush and vaginal candidiasis) is one of many well-known opportunistic infections in patients with SLE and *Candida* being the most common opportunistic fungal infection identified [3]. In contrast, invasive fungal infection (IFI), such as cryptococcal meningitis and candidemia, are rare and life-threatening conditions [2]. Typically occurring in hosts with HIV infection or in patient's immunosuppressed due to transplantation or chemotherapy, there is a substantial risk that IFI in SLE are under-recognized by clinicians [8]. The patient had no history of recurrent infections and he had not received systemic corticosteroids during this period. Because IFI are unusual in a healthy host, we tried to identify a causal immunodeficiency. The result of test for the detection of HIV was negative and the lupus biology report was positive. Lupus patients with IFI have rarely been described with only a 0.83% incidence in the present 21-year retrospective study [2,6]. The majority of series reported were women of younger ages receiving steroid therapy [6]. Treatment with corticosteroids with a maximum prednisone dose (≥ 30 mg/day) during the fungal infection has been identified as a risk factor for invasive fungal infections, including invasive candidiasis [3]. In lupus patients not receiving corticosteroids, like our case, high disease activity is associated with a significant risk factor for IFI [3,6,7]. Multiple antibiotics were also confirmed to be risk factors for interstitial pneumonia fungal infection (IPFI) in lupus patients [5]. In addition, underlying interstitial pneumonia is a risk factor for developing IPFI in lupus patients. Patients with underlying lung diseases such as interstitial pneumonia tend to have secondary infections, which precipitate respiratory failure and even death. It is noteworthy that the widespread use of glucocorticoid therapy in the treatment of interstitial pneumonia also promotes secondary fungal infections [5]. Due to its relatively insidious onset, rapid progression and the difficulties of accurate laboratory diagnosis, IPFI represents a true challenge for clinicians to make prompt and appropriate decisions about patient management [4,5]. The diagnosis may also be complicated by the overlap of clinical characteristics with active SLE [2]. Some cases were only diagnosed post-mortem. Further-more, features of IFI may overlap with findings of a SLE flare [9]. Traditional laboratory methods used for detecting funguses rely on a time-consuming morphological process. Currently, non-culture methods and molecular biology methods have greatly assisted the clinical diagnosis of fungal diseases [5]. *Candida albicans* is the most common pathogen. It is responsible for 72.3% of all fungal infectious agents, followed by *Candida krusei* and *Candida glabrata*, *Candida tropicalis* and *Candida parapsilosis*. Moreover, other studies have also reported that *Candida* species were dominant pathogens [10]. However, in Taiwan and Korea, the most prevalent pathogens were *Cryptococcus* and *Aspergillus*, respectively [7,11]. Early and accurate diagnosis plays an important role in the management of IPFI [5]. Without timely therapeutic interventions, the mortality rate has reached 30-80% [12], and many cases were only diagnosed post-mortem [2,13]. For patients with risk factors for IPFI, an empirical anti-fungal therapy may provide a prognostic benefit. An evaluation form was used to assess risk factors for deep fungal infection at the West Virginia University Hospital in the United States, which was recommended to be undertaken in advance to determine high-risk patients and consider the necessity of appropriate preventive therapy [5].

Conclusion

We describe a patient with SLE who suffered from pneumonia caused by *Candida albicans* and review the literature on this topic. This clinical case reported the high morbidity and mortality associated with IFI in the reported literature. Clinical vigilance is essential to detect this fatal complication. Increased index of suspicion for invasive fungal infections may shorten time to diagnosis and appropriate antifungal therapy and reduce mortality.

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