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CASE REPORT

A Case Report of Pulmonary Cryptococcosis Associated with Meningitis in an Immunocompetent Individual

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Cryptococcus neoformans is encapsulated yeast primarily affects immunosuppressed and HIV infected individuals. Extrapulmonary dissemination and involvement of other organs are rare in immunocompetent persons. Here, we describe a case of disseminated cryptococcosis in an immunocompetent individual manifested as pleural effusion and meningitis.

Key words: Cryptococcosis, immunocompetent person, pleural effusion

INTRODUCTION

Cryptococcus neoformans is encapsulated yeast with ubiquitous distribution. Infection is primarily caused by two species within the genus *Cryptococcus*, *C. neoformans var neoformans* and *C. neoformans var gatti*. *C. neoformans var neoformans* predominantly found in tropical and subtropical countries and usually causes disease in immunocompromised individuals.[1] Reported cases of cryptococcal infections among immunocompetent individuals are increasing and primarily involved respiratory and cutaneous systems.[2,3] In this case report, we describe a rare case of cryptococcal infection in an immunocompetent individual involving meninges and pleural cavity.

CASE REPORT

A 40-year-old male patient was admitted to our hospital with the complaints of intermittent high-grade fever, severe headache followed by vomiting, irritability, and convulsion since 1½ month with aggravation for last 1 day. The patient was known alcoholism. Physical examination revealed normal body temperature, pulse rate and blood pressure. The consciousness level was semiconscious with the presence of neck rigidity and positive kernig's sign. Chest movement was decreased on the left side, dull in percussion on the left side compared to the right and with associated coarse crepitation of left sided chest.

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Hematological investigation findings revealed complete blood count 4370/cmm, with neutrophil count 80%, hemoglobin 9.9 g% and erythrocyte sedimentation rate 49 mm/h. Chest X-ray showed left sided plural effusion [Figure 1]. Sputum for acid-fast bacilli was negative. Blood and urine cultures all were negative. HIV1 and HIV2 antibodies showed negative. Liver function tests were within normal range with C-reactive protein level 200 ng/L. Pleural fluid and cerebrospinal fluid (CSF) were collected aseptically. CSF was clear, colorless with normal pressure. Cell count 10/cmm, all cells were mononuclear and biochemical findings showed glucose 51 mg/dl, protein 80 mg/dl, chloride 108 meq/L, lactate dehydrogenase 33 u/L and adenosine deaminase 21 u/L. Gram-stain and Z-N stain from both the samples failed to show any bacterial agents and acid-fast bacilli, respectively. Indian ink preparation of both samples showed plenty of capsulated budding yeast cells morphologically similar to *Cryptococcus* [Figure 2]. Both the aspirated plural fluid and CSF samples were inoculated onto Saburaud's dextrose agar (SDA), blood agar and MacConkey's agar media. After 48 h of incubation, a creamy mucoid colony was found on SDA [Figure 3], but no growth was detected on blood agar and MacConkey's agar. Gram-staining from the growth of the SDA media from both the samples showed budding yeasts [Figure 4] and the growth was urease positive [Figure 5].

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Subsequently, after proper diagnosis intravenous amphotericin B and oral flucytosine was started and after 4 months of prolonged therapy, he made an uneventful recovery.

DISCUSSION

C. neoformans is encapsulated yeast having the ability to cross the blood-brain barrier and able to cause disseminated infections with immunocompetent and immunocompromised individuals.[4] It is distributed worldwide found predominantly in decaying vegetation. Infection is normally occurs through respiratory route and evidence suggests that it may present as a dormant state within the lung tissue. From the lungs, it may spreads via hematogenous route to other extrapulmonary sites such as skin, brain, myocardium, musculoskeletal tissue, adrenal glands, spleen, and prostate.[5]

C. neoformans is responsible for the majority of cryptococcal infection in immunocompromised individuals whereas *C. neoformans var gatti* affects mainly immunocompetent individuals.[2,3] Clinical manifestation of disseminated cryptococcosis is variable. Central nervous system involvement is the most common manifestation of disseminated disease.[6] Common presenting features include a headache, fever, and malaise. Our case is also presented with similar clinical features. There are only few reported cases of disseminated cryptococcosis in immunocompetent individuals in India and worldwide.[2-4,6]

Figure 1: Chest X-ray showing left sided plural effusion

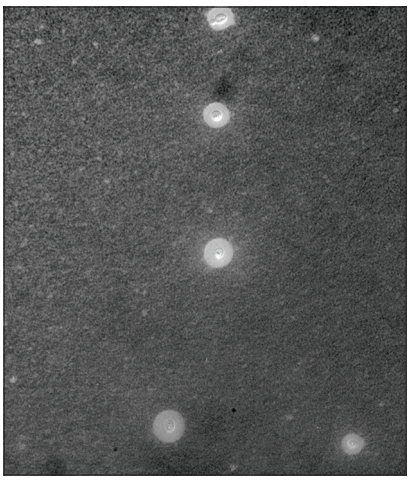

Figure 2: India ink preparation showing capsulated budding yeast cells

Figure 3: Colony morphology of *Cryptococcus neoformans* on Saburaud's dextrose agar slant

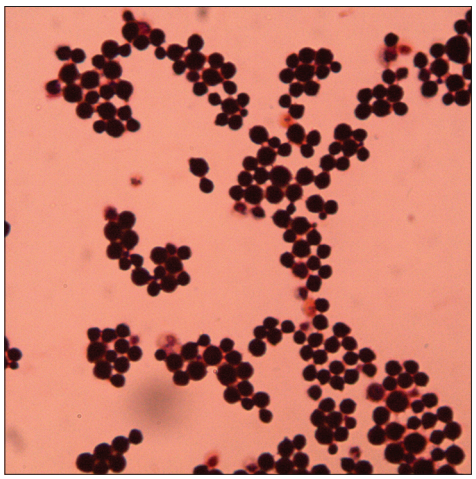

Figure 4: Gram-stain appearance of *Cryptococcus neoformans*

Figure 5: Tube showing positive urease test

Regarding diagnostic options cryptococcal antigen testing is nearly 100% sensitive and 97–99% specific when serum sample was collected and 96–100% sensitive and 94–99% specific when CSF sample was collected. Histopathological examination of a biopsy specimen from affected area may also help in the diagnosis. Culture from blood, sputum, and CSF are usually diagnostic.[7] In our case, the diagnosis is established by direct microscopic examination and positive culture report. Latex agglutination test for detecting cryptococcal antigen is currently not available in our resource limited setup.

The drug of choice for treating disseminated cryptococcal infection in initial phases is amphotericin B with or without flucytosine because of its rapid onset of action and early clinical improvement.[8] Our patient was treated with IV amphotericin B and oral flucytosine and patient made an uneventful recovery.

The differential diagnosis of pulmonary and meningeal cryptococcosis includes tuberculosis, a metastatic malignancy of brain, neurosarcoidosis, and histiocytosis. In a tuberculous endemic area like India, cryptococcosis may be misdiagnosed as a tubercular infection. However in our case diagnosis is conclusively proved by direct demonstration of fungal elements under a microscope and positive culture report.

To conclude, a high degree of clinical suspicion is required to diagnose cryotococcal infection in immunocompetent individuals. Clinicians should be cautious that all cases of plural effusion or lung masses are not because of neoplasm or tuberculosis other infection like cryptococcosis should be considered as a differential diagnosis.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Chen S, Sorrell T, Nimmo G, Speed B, Currie B, Ellis D, *et al.* Epidemiology and host- and variety-dependent characteristics of infection due to *Cryptococcus neoformans* in Australia and New Zealand. Australasian Cryptococcal Study Group. Clin Infect Dis 2000;31:499-508.
2. Lui G, Lee N, Ip M, Choi KW, Tso YK, Lam E, *et al.* Cryptococcosis in apparently immunocompetent patients. QJM 2006;99:143-51.
3. Aberg JA, Mundy LM, Powderly WG. Pulmonary cryptococcosis in patients without HIV infection. Chest 1999;115:734-40.
4. Goldman JD, Vollmer ME, Luks AM. Cryptococcosis in the immunocompetent patient. Respir Care 2010;55:1499-503.
5. Zhu LP, Shi YZ, Weng XH, Müller FM. Case Reports. Pulmonary cryptococcosis associated with cryptococcal meningitis in non-AIDS patients. Mycoses 2002;45:111-7.
6. Suchitha S, Sheeladevi CS, Sunila R, Manjunath GV. Disseminated cryptococcosis in an immunocompetent patient: A case report. Case Rep Pathol 2012;2012:652351.
7. Mitha M, Naicker P, Mahida P. Disseminated cryptococcosis in an HIV-negative patient in South Africa: The elusive differential diagnosis. J Infect Dev Ctries 2010;4:526-9.
8. Perfect JR, Dismukes WE, Dromer F, Goldman DL, Graybill JR, Hamill RJ, *et al.* Clinical practice guidelines for the management of cryptococcal disease: 2010 update by the infectious diseases society of America. Clin Infect Dis 2010;50:291-322.