ejpmr, 2023,10(9), 559-561

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Case Report

ISSN 2394-3211

EJPMR

CASE REPORT ON CANDIDA PNEUMONIA: A RARE INFECTION DUE TO CANDIDA KRUSEI

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Article Received on 05/07/2023 **Article Revised on 25/07/2023** **Article Accepted on 15/08/2023**

ABSTRACT

Fungal infections caused due to candida species now recognized as a high cause of morbidity and mortality in hospitalized patients. They are capable of causing infections in both immuno-compromised and immuno-competant individuals. But the incidence of infections is more in immunocompromised patients. According to the infectious disease society of America clinical practice guideline, candida is frequently isolated from patients who are in intensive care units and are intubated. Candida pneumonia is a rare infection of the lungs, with the majority of cases arising as a result of the Candida organism spreading. The specificity of the pathogens and the slow-moving course of pneumomycosis pose significant challenges for proper diagnosis and delay the timely start of treatment, aggravating inflammatory changes. It is understood that hospitalized individuals rarely develop pneumonia from a Candida species. However even in patients who are immunocompetent, health care practitioners should be aware that Candida pneumonia should be suspected as part of the differential diagnosis. A 53 year old gentleman presented with complaints of a productive cough with whitish sputum of non foul smell and shortness of breath (insidious onset) for 2 days. His chest X-ray revealed pulmonary edema with elevated inflammatory markers suspecting sepsis. Accordingly, the treatment was initiated. Video bronchoscopy was performed, revealing mucoid secretions in the right ML/LL segments. He was kept on intermittent NIV(1:2) due to persistent tachycardia and tachypnea and repeated chest X-rays that revealed pneumonia. On day 8, BAL culture yielded C.krusei, revealing a rising trend in blood counts. Treatment initiated with T. Voriconazole 200 mg which is sensitive to C. krusei along with T. Doxycycline 100mg and Inj. Meropenem 1gm. By day 15, the patient was feeling symptomatically better. In conclusion, the diagnosis of candida pneumonia should be strongly considered in the presence of growth of candida from a sputum culture and immediate treatment should be initiated according to the sensitivity pattern for the early prevention, to prevent further complications and to improve patient condition.

INTRODUCTION

According to the infectious disease society of America clinical practice guideline, candida is frequently isolated from patients who are in intensive care units and are intubated.[1] There are at least 15 distinct Candida species out of which 90% of invasive disease is caused by C. albicans, C. glabrata, C. tropicalis, C. parapsilosis and C. krusei.[7] They are reported in immunocompromised patients or patients receiving broad spectrum antibiotics and are attributed to aspiration of organisms into the lung from the upper airway.[1] Candida pneumonia is a rare infection in the lungs, with the majority of cases occurring in secondary to dissemination of Candida organism through blood from distant sites, usually the gastrointestinal tract or skin.[1] Fungal pneumonia are categorized based on the fungus that causes the infection viz. *Pneumocystis* (caused by yeast), *coccidioidomycosis* (caused by Coccidioides fungi), *Histoplasmosis* (caused by Histoplasma fungus), *Cryptococcus* (caused by Cryptococcus neoformans) and *Aspergillosis* (caused by Aspergillus).[8] Candida pneumonia was first described by Nils Rosen von Rosenstein in 1984.[2] and later reported by Castellani in 1927.[3] The true incidence of candida pneumonia ranges from 0.23% to 0.4%. Despite the high incidence of Candida isolation (40-56%) in respiratory samples of BAL and sputum, Candida pneumonia remains a rare entity.[4] Pneumonia due to Candida infection is rare and is frequently associated with a high mortality rate exceeding upto 70%.[1] The common signs and symptoms consist of fever, cough, dyspnea, and pulmonary infiltrates on radiography.[5] Diagnosis of fungal pneumonia is difficult, but effective methods include microscopic examination, fungal culture (respiratory fluid samples, BAL), antigen and antibody testing, X-ray and chest CT scans may assist in the detection of fungal masses.[6] Amphotericin

B is usually the first-line treatment for invasive Candida infections, followed by flucytosine if synergism is needed. The imidazole antifungal drugs, such as ketoconazole, fluconazole, and itraconazole, are effective against C.albicans and are also used as prophylaxis.[5] C. glabrata infection may require a higher dose of fluconazole (12 mg/kg daily) or voriconazole (3-4 mg/kg twice daily) in fluconazole or voriconazole susceptible isolates, voriconazole is recommended as step-down oral therapy for cases of candidemia caused due to C. krusei.[7]

CASE REPORT

A 53 year old gentleman presented with complaints of a productive cough with whitish sputum of non foul smell and shortness of breath (insidious onset) for 2 days. He had no significant past medical history and during chest examination, the patient had bilateral crepitations with decreased air entry to the left side of the lungs. He was placed on.

Non-Invasive Ventilation (NIV) (FiO2-70%) after being shifted to the Intensive Care Unit (ICU) due to the development of tachypnea (28/min), tachycardia (130-140 bpm), and desaturation (92-97% with BIPAP). He was started with Meropenem, Azithromycin and nebulized with mucinac and Duolin as Broncho-Alveolar Lavage (BAL) culture was sent for examination on day-2. Later, on day-3 when his saturation had reduced to 92% (Fio2-40%), Tab. Fluvir was administered and Enoxaparin was started as well because of his elevated D-dimer (2119.43 ng/ml) and pro BNP (6030) levels. His X-ray revealed pulmonary edema (fig 1) and hence inj. furosemide was started, his initial studies showed abnormal LFT and RFT, high total counts, and noticeably elevated inflammatory markers (CRP, ESR, Procalcitonin) suspecting sepsis on day-8. HRCT thorax revealed extensive areas of consolidation with air bronchogram and ground glass opacities detected in both lungs, mostly in both upper lobes—likely active infectious processes, also Bronchiectatic changes noted involving the right middle lobe (fig 2, fig 3 and fig 4). Patient continued to be tachypneic, and ABG tests suggested respiratory alkalosis, therefore NIV was commenced. He was started on RT feed and antibiotics (Inj. Meropenem, Tab. Azithromycin), IV. anticoagulants, oral antivirals, bronchodilator nebulizations, antihistamines, mucolytics, PPIs were continued. A screening echo on day-3 indicated pericardial on the RA side and LVEF 50%, mild MR, grade 2 TR, TR gradient 47 mmHg which indicated cardiac failure. Potassium supplements were started in view of hypokalemia. Patient was advised to undergo CT PA in order to rule out pulmonary embolism and inj.clexane was given to prevent the same. On day 3, a video bronchoscopy was performed, revealing mucoid secretions in the right ML/LL segments and the sample was sent for culture and sensitivity. The following day, he was weaned off NIV to face mask and extubated as his clinical condition improved. He was kept on intermittent NIV(1:2) due to persistent tachycardia and tachypnea and repeated chest X-rays that revealed pneumonia that was getting worse (fig 5) and Ivabradine was initiated in view of tachycardia. URE sent which showed 10-12 pus, albumin 2+ numerous RBCs. On day-8, BAL culture yeilded candida krusei and Multiple blood tests revealed rising trends in CRP, total count, abnormal LFT, and treatment with T.voriconazole 200 mg and T.doxycycline 100 mg was initiated along with Inj. meropenem 1g which was continued. By day-15, he was symptomatically better and weaned off to nasal prongs and intermittent NIV in the ratio of 4:1. He was shifted to ward from ICU and repeated CRP showed a decreasing trend with improving ABG, and the patient was tapered to room air. IV antibiotics were stopped after 15 days. The patient became symptomatically better, he was shifted to the ward on day 15. His nebulization was tapered and stopped. The patient was hemodynamically stable and symptomatically better.

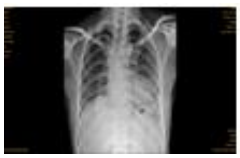


Fig.1

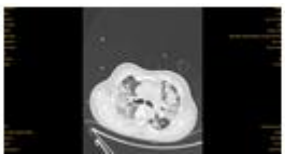
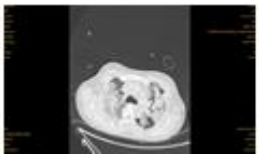


Fig.2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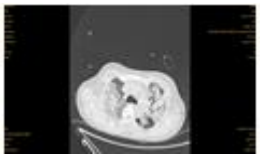
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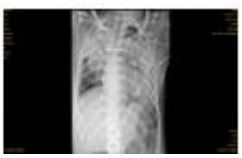
Fig.5

DISCUSSION

Candida pneumonia is a rare reported case associated with a high mortality rate. In our study the case involved Candida krusei which can be confirmed by microbiological cultures, bronchoscopy, surgical lung biopsy. Candida krusei is an opportunistic pathogen belongs to non albicans group of candida found in normal microbial flora of a human especially in the skin, mucous membranes and digestive tract and it mainly cause life-threatening invasive infection with growing incidence, should always considered in patients presenting cough, expectoration of purulent secretions and hypoxemia. Early diagnosis and appropriate treatment will help in better recovery.

In the present study the patient developed symptoms of cough insidious in onset, productive whitish sputum, and also had breathlessness. Initially the patient was diagnosed with broncho-pneumonia as his chest X-ray showed infiltration.

Our patient was warranted to ICU due to the severity of illness. HRCT thorax revealed extensive areas of consolidation with air bronchogram and ground glass

opacities in both lungs, mostly in both upper lobes. Culture was sent for evaluation and yielded fungal microflora (Candida krusei), the organism showed sensitivity to voriconazole hence treatment with the same was initiated.

Although in our case the patient was not immunocompromised but he was intubated in ICU and also he was undergoing treatment with Meropenem and Azithromycin (both are broad spectrum antibiotics) which might have led to fungal pneumonia viz. Candida krusei.

In summary, we have discussed the pathology and clinical course of this case of Candida pneumonia, where the diagnosis was made based on microbiological culture and radiological evidence. Even though the clinical causes of the infection were serious and life-threatening, the patient eventually made a full recovery with the help of the proper antifungal therapy.

ABBREVIATIONS

IV - Intravenous
BAL-Broncho-Alveolar lavage
CT scans- Computed Tomography Scan
ICU- Intensive Care Unit
HRCT-High-resolution Computed Tomography
NIV-Non-invasive ventilation
Fio2- fraction of inspired oxygen
BNP-Brain natriuretic peptide
LFT- liver function test
RFT- Renal function test
CRP- C reactive protein
ESR- Erythrocyte sedimentation rate
ABG- arterial blood gas
RT- Ryle's Tube
PPIs- Proton pump inhibitors
RA- Right atrial
LVEF- Left ventricular ejection fraction
TR- Tricuspid regurgitation
CT PA- Computed Tomography Pulmonary Angiogram
URE- Urine urea nitrogen
ET- Endotracheal tip

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