Case Report

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Candida blankii Candidaemia: A Case Report of an Emergent Opportunistic Pathogen with Reduced Susceptibility

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Abstract

Due to the growing number of critically ill patients, candidaemia became one of the most frequent causes of invasive fungal infections. It causes an overall mortality of more than 50% in hospitalized patients and is associated with prolonged hospital stay and high healthcare costs. Five species of Candida (*C. albicans*, *C. glabrata*, *C. tropicalis*, *C. krusei* and *C. parapsilosi*) account for more than 90% of all diagnosed cases, but less frequent species causing candidaemia are described.

Our report highlights the emergence of *C. blankii*, an opportunistic pathogen with reduced susceptibility to Fluconazole and Echinocandins. The therapeutic experience is limited but it is more prudent to avoid these agents for treatment of *C. blankii* infections. Posaconazole, Voriconazole and Amphotericin B seem to be the first line therapy to use.

Keywords: *C. albicans*; *C. parapsilosi*; *C. glabrata*; *C. tropicalis*; Posaconazole

Introduction

Candida spp. is the main cause of invasive fungal infections in hospitalized patients [1]. Widespread increase in these infections is predominately due to medical progress (increased prevalence of susceptible hosts receiving corticotherapy, immunosuppressive therapy for organ transplantation, broad-spectrum antibiotics and use of prophylactic or empiric antifungal therapy). The most frequent of invasive candidiasis is candidaemia, a clinical condition with an overall mortality of more than 50%. The prognosis for candidaemia is comparable to that of septic shock, but in recent years the proportion of non-*C. albicans* strains resistant to triazole has significantly increased [2].

In 2015, Zaragoza et al. reported a 14-year-old teenage boy with cystic fibrosis presenting repeated pulmonary exacerbations with *Candida blankii* [3]. Since, two other reports (a 27-week-old preterm neonate with necrotizing enterocolitis and a 16-year-old female with bilateral lung transplantation for cystic fibrosis) have hignlighted the clinical relevance of *C. blankii* in human infections [4,5]. Here we described another case of *C. blankii* candidaemia diagnosed by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry on yeast colonies from blood cultures and confirmed by sequence analysis of the internal transcribed spacer.

Case Description

The patient was a 34-year-old male hospitalized for fever of unknown origin. His medical history was notable for X-linked chronic granulomatous disease (a hereditary disorder of host defense due to absent or decreased activity of phagocyte NADPH oxidase), ulcerative colitis, Rendu-Osler-Weber disease and multiple episodes of pulmonary aspergillosis under antifungal prophylaxis consisting of itraconazole 100 mg per day. Blood cultures were collected (Bactec plus Aerobic/F and Bactec Lytic/10 Anaerobic/F, Becton Dickinson) and became positive for yeasts after 30 hours of incubation (aerobic bottle). Fluconazole was prescribed due to the report of yeasts on blood cultures. The yeast isolate initially presented pink colonies wich turned into dark blue (similar to *Candida tropicalis*) on CHROMagar Candida after 24 hours incubation (Figure 1) and were identified by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI Biotyper, Bruker Daltonics) as Candida blankii CBS 1898T (score value: 1,97). The yeast identification was confirmed by sequence analysis of the internal transcribed spacer (ITS 1 and ITS 2, MycoBank Database). The antigungal treatment was switched to Anidulafungine due to the yeast identification. Antifungal susceptibility testing was carried out using broth microdilution method (Sensititre YeastOne YO10, thermo scientific) and the minimal inhibitory concentration values were: Anidulafungin=0.25 µg/mL, Micafungin=0.12 µg/mL, Caspofungin=0.25 µg/mL, 5-Flucytosine=0.06 µg/mL, Posaconazole=1 µg/mL, Voriconazole=0.5 µg/mL, Itraconazole=0.5 µg/mL, Fluconazole=16 µg/mL and Amphotericin B=1 µg/mL. (Figure 2). Because the isolate showed reduced susceptibility to Caspofungine, Anidulafungine and Fluconazole, the treatement was shifted to Voriconazole and Amphotericin B. Afer 4 days antifungal therapy, blood cultures

were still positive and the patient was transferred to intensive care unit. A bone marrow aspiration was realised for pancytopenia and showed yeast invasion (Figure 3). Despite the treatment, the patient developed a multiple organ failure and died on day 7 of hospitalization.

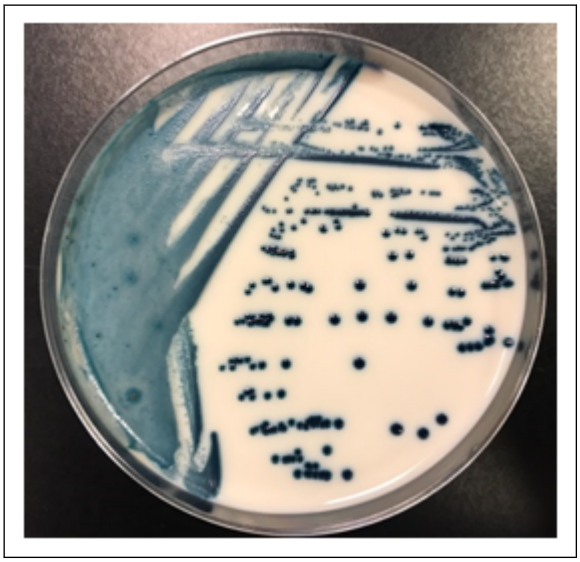

Figure 1: CHROMagar Candida: *C. blankii* dark blue colonies (similar to *C. tropicalis*) after 24 h incubation at 35°C.

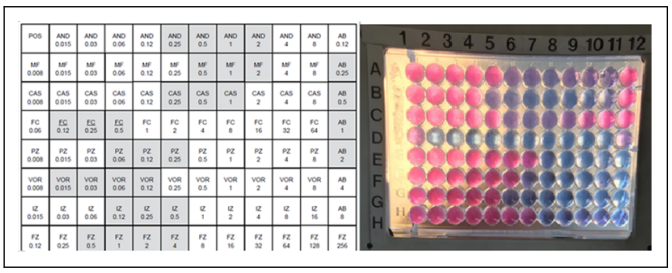

Figure 2: Broth microdilution method: Anidulafungin=0.25 µg/mL; Micafungin=0.12 µg/mL; Caspofungin=0.25 µg/mL; 5-Flucytosine=0.06 µg/mL; Posaconazole=1 µg/mL; Voriconazole=0.5 µg/mL; Itraconazole=0.5 µg/mL; Fluconazole=16 µg/mL and Amphotericin B=1 µg/mL.

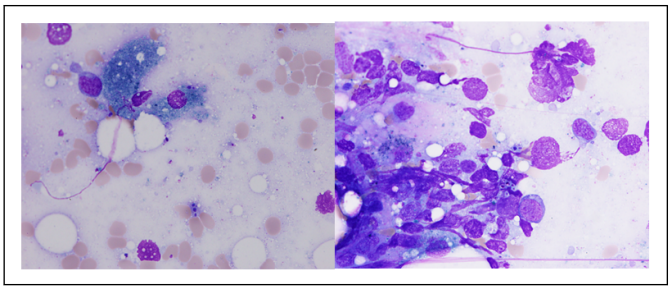

Figure 3: Bone marrow aspiration, May-Grunwald-Giemsa coloration (x500): Yeast invasion.

Results and Discussion

Candidaemia is one of the most frequent causes of bloodstream infections and is associated with high morbidity and mortality, prolonged hospital stay and high healthcare costs [6-8]. Blood cultures (current diagnostic gold standard) are positive for Candida spp. in less than 50% of candidaemia [9] and explain the poor patient outcomes. Moreover, candidaemia incidence is increasing because of the growing number of critically ill patients [2,10]. Five species of Candida (*C. albicans*, *C. glabrata*, *C. tropicalis*, *C. krusei and C. parapsilosi*) account for more than 90% of all diagnosed cases [11], but less frequent species causing candidaemia are described.

Our report highlights the emergence of *C. blankii*, an opportunistic pathogen with reduced susceptibility to Fluconazole and Echinocandins. The therapeutic experience is limited (one other case of bloodstream infection and one case of pulmonary exacerbation) but the two other case reports show the same data concerning the minimal inhibitory concentrations.

Conclusion

In conclusion, it is more prudent to avoid Fluconazole and Echinocandins for the treatment of *C. blankii* infections. Posaconazole, Voriconazole and Amphotericin B seem to be the first line therapy to use.

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