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Case Report

Candida utilis causing neonatal Candidemia – A case report and literature review

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ABSTRACT

Candida utilis is rarely described as an agent causing neonatal Candidemia. We report a fatal case of neonatal sepsis caused by *C. utilis*. Treatment was initiated with fluconazole. Despite resuscitative measures, the infant succumbed on day four of admission in the neonatal intensive care unit. To our knowledge, this is the first case report of *C. utilis* causing neonatal Candidemia in India. Our report and review highlight the importance of speciation and choice of antifungal therapy for successful clinical management of such cases the need of such important clinical and epidemiological data.

1. Background

Candidemia caused by non-albicans *Candida* species is increasing in the last few decades. A recent multicentric study from India on Candidemia acquired in intensive care units highlighted the unique epidemiology and vast spectrum of Candida species.[1] Improvement in medical treatment of immunocompromised individuals has contributed towards increase in susceptible population. One such group is the neonates, and its emergence of rare and virulent species of *Candida* among them is well documented in India.[2,3] The incidence of Candidemia in children is highest among infants <3 years of age, particularly in newborns. Premature infants [very low birth weight (<1500 g) and extremely low birth weight (<1000 g)] hospitalised in neonatal intensive care units (NICUs) and those on prophylactic antibiotics are at high risk.[4] *Candida* is the third most common of blood culture isolates causing late-onset neonatal sepsis in them.[5] Candidemia in neonates is an ominous prognostic sign. We report a case of fulminant late onset sepsis with acute renal failure in a neonate due to a rare species, *Candida utilis*.

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2. Case report

A 19-day-old female infant was admitted to our hospital with complaints of poor feeding and abnormal body movements since one week. She was a full term born, weighing 3040 g and delivered by lower segment caesarean section in another hospital. She was hypothermic, tachypneic and tachycardic. She also had pedal and periorbital oedema, pallor, ascites and sclerema. She had facial twitching with increased tone in all four limbs and abnormal body movements suggesting convulsions. She was admitted to the NICU. Oxygen support, intravenous fluids and intravenous phenobarbitone with supportive care were given. Blood samples were drawn for culture. Antibiotic therapy was started prophylactically with ceftriaxone 300 mg stat dose followed by 200 mg per day. Her renal function parameters were deranged (serum creatinine-6.35 mg/dL). She had anaemia, hypocalcaemia with thrombocytopenia. Peritoneal dialysis was initiated in view of hyperkalemia and metabolic acidosis.

On the second day *C. utilis* was isolated from blood culture. Blood culture was performed by automated Bact/Alert 3D system [BioMerieux]. The blood culture bottle when indicated positive was subcultured onto Blood agar and MacConkey agar media. Gram stain showed Gram-positive budding yeast like cells. Primary isolation and speciation were performed using the carbohydrate assimilation tests using Vitek 2 yeast identification and antifungal susceptibility testing system and by using HiCrome Candida differential agar medium, which yielded growth of large rough pink colonies (Fig. 1). The isolate was sensitive to all the tested antifungals-amphotericin B, flucytosine, fluconazole, voriconazole, caspofungin and micafungin (Table 1). Strict quality control was followed during the isolation.

Intravenous fluconazole was initiated with 36 mg stat on the first day of detected Candidemia followed by 18 mg of antifungal once a day. In view of poor respiratory efforts, the infant was put on continuous positive airway pressure. On the same day, since she did not show improvement she was electively intubated and put on mechanical ventilator. Ionotropic support was started. Piperacillin tazobactam was added to the treatment. Her serum creatinine continued to be elevated (4.73 mg/dL) on the third day of admission. She was also transfused with packed red blood cells, fresh frozen plasma and single donor platelets during the period of admission. Patient did not show improvement despite peritoneal dialysis, mechanical ventilation and ionotropic support. She continued to have anuria and respiratory distress. Peritoneal dialysis was stopped after 58 cycles. Peritoneal fluid was sterile. She developed hypotension and bradycardia on the wee hours of the fourth day of admission. Ionotropic support was escalated, and fluid boluses were given. Her condition deteriorated with bradycardia and desaturation. She developed cardio respiratory arrest, in spite of all resuscitative efforts she could not be revived and succumbed to the infection.

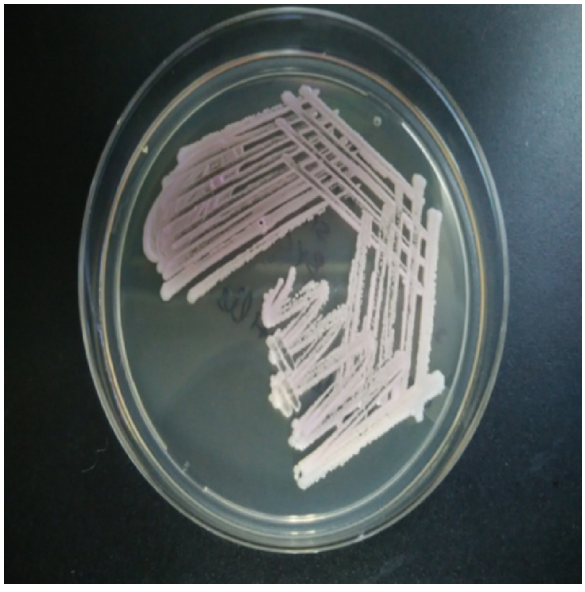

Fig. 1 – *Candida utilis* on HiCrome Candida differential agar.

Table 1 – Antifungal susceptibility of *Candida utilis* isolate based on VITEK 2 System Version 06.01.

Antifungal drug	Minimum inhibitory concentration	Interpretation
Flucytosine	≤1	Sensitive
Fluconazole	≤1	Sensitive
Voriconazole	≤0.12	Sensitive
Amphotericin B	≤0.25	Sensitive
Micafungin	≤0.25	Sensitive
Caspofungin	≤0.25	Sensitive

MIC Interpretation guideline based on CLSI M100-S25 (2015).

3. Discussion

C. utilis, an anamorphic form of *Pichia jadinii* is known for its industrial applications, it is capable of several non-ethanolic fermentation reactions.[6] It can also use alcohols as a carbon source, it is rarely described as an infectious agent in humans.[4,7] There are only few case reports of Candidemia caused by *C. utilis* as summarized in Table 2. As far as our knowledge is concerned this is the first case report of *C. utilis* Candidemia in our hospital and in India. *C. utilis*, however, was reported as one of the unusual isolates (<5 isolates) in a previous retrospective study in New Delhi which reported a shift to non-*albicans* species of *Candida* with emergence of amphotericin B and azole resistant species.[2] Although *Candida albicans* is the most common fungal agent from neonatal Candidemia, many studies have detected a shift towards non-*albicans Candida* (NAC) species. Recognition of this change is necessary, since the various species differ in susceptibility to the newer antifungal agents.[8]

In our patient, a significant number of risk factors coexisted with acute renal failure, previous hospitalization and treatment with prophylactic antibiotics. The clinical condition was not favourable during admission. Candidemia although was detected very early, and the isolate was susceptible to fluconazole in vitro, the clinical response could not be assessed due to the rapid and fatal outcome.