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AN EXQUISITE CASE SERIES: CANDIDA UTILIS SEPTICEMIA IN NEONATES AT A PRESTIGIOUS TERTIARY CARE FACILITY

Microbiology

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ABSTRACT

The incidence of Candida utilis septicaemia is on the rise, particularly among immunocompromised neonates in neonatal intensive care units (NICUs). This case series presents three neonates admitted to the NICU, each with distinct clinical presentations. Methodologically, blood samples underwent comprehensive analysis, combining conventional microbiological techniques with automated systems for identification and antifungal susceptibility testing. Results revealed Candida utilis as the causative agent, sensitive to multiple antifungal agents. Discussion highlights the significance of accurate species identification for effective treatment, particularly in the face of emerging antifungal resistance. The discussion also underscores the importance of surveillance for uncommon fungal pathogens to enhance management strategies and improve outcomes in NICU settings. This case series underscores the necessity of vigilant monitoring and targeted management to combat non-albicans candidiasis in vulnerable neonatal populations.

KEYWORDS

Candida utilis, neonatal septicemia, neonatal intensive care units (NICUs), antifungal susceptibility testing, MALDI-TOF MS (matrix-assisted laser desorption–ionization time of flight mass spectrometry), immunosuppression, premature infants, extremely low birth weight (ELBW), very low birth weight (VLBW), bloodstream infections, antifungal resistance.

INTRODUCTION :

In recent decades, the incidence of Candida utilis septicaemia has been escalating, particularly among immunocompromised neonates in neonatal intensive care units (NICUs). The prevalence of candidemia in India is 6–18□ %□ and there is a upward trend in non-albicans *Candida* spp causing blood stream infections. A study from Northeast India demonstrated a prevalence of 6□ % candidemia with a predominance of non-albicans *Candida* species of 70□ % [1]. Premature infants with very low birth weight (VLBW, <1500g) and extremely low birth weight (ELBW, <1000g) are particularly vulnerable. *Candida utilis* fungaemia has mainly been reported in immunocompromised patients, neonates and following surgical intervention [2].Early diagnosis and effective treatment are paramount to prevent morbidity and mortality associated with this condition.

METHODOLOGY:

Clinical Case Histories: This case series follows three neonates admitted to the NICU:

Case 1: A 25-day-old premature infant with VLBW, admitted with early-onset sepsis and thrombocytopenia admitted with early-onset sepsis and thrombocytopenia.

Case 2: A preterm VLBW infant, admitted at 5 days of life with respiratory distress.

Case 3: A 15-day-old term infant, admitted with respiratory distress

BactAlert blood bottles for culture and sensitivity testing were analysed using both conventional methods and automated systems. Conventional tests included Gram stain of the broth, culturing on Blood Agar and Sabouraud Dextrose Agar, followed by the Germ Tube test and biochemical reactions after it flagged positive on BactAlert 3D. Automated MALDI-TOF MS identification and antifungal susceptibility testing (AFST) confirmed the findings of the conventional tests.

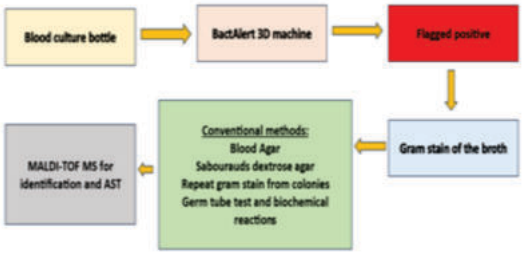

Figure 01: Processing of blood sample

Figure 2: BactAlert bottle and machine

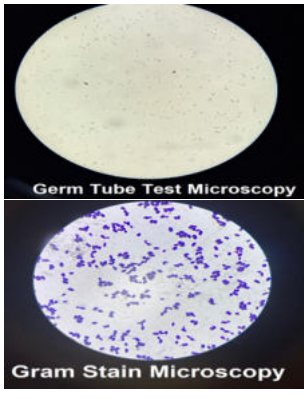

Fig 3 ,4: Germ tube test and Gram stain

RESULTS:

All the three samples were cultured on Blood Agar, yielding smooth, cream-colored non haemolytic colonies. Gram staining revealed budding yeast cells. Colonies on Sabouraud Dextrose Agar were cream-colored, pasty, and glistening after 48 hours of aerobic incubation at 37°C. The Germ Tube test showed budding cells without pseudo hyphae. Sugar fermentation tests revealed that glucose, sucrose, xylose, and raffinose were fermented, while galactose, maltose, and lactose were not. Assimilation tests showed that glucose, maltose, raffinose, and xylose were assimilated, but galactose was not. All three samples from the NICU displayed the same results, identified

as *Candida utilis*, which was sensitive to Amphotericin B, Fluconazole, Voriconazole, Itraconazole, and Flucytosine. The antifungal susceptibility testing and identification by MALDITOF MS (BioMérieux, Version 3.2, France) with minimum inhibitory concentrations (MICs) confirmed the findings of conventional assay.

DISCUSSION:

The neonates were immunosuppressed due to ongoing sepsis and respiratory distress. In our cases, Candida utilis emerged as the primary cause of neonatal septicaemia due to severe immunosuppression. Deep immunosuppression led to pathogenesis of *Candida utilis* catheter related blood stream infections [3]. *Candida utilis* had been reported as an opportunistic pathogen where it was reported from blood of neutropenic AIDS patient; despite prolonged fungemia, the patient survived as virulence of *Candida utilis* strain was low [4]. Resistance to antifungal agents such as fluconazole has been more common in *non-albicans Candida*; identification of candida species is necessary for targeted management [5]. All the 3 Neonates demonstrated significant improvement with Amphotericin B treatment, leading to complete recovery in our hospital.

CONCLUSION:

Surveillance for emerging fungal pathogens is critical for monitoring the spread of non-albicans candidiasis. Uncommon Candida species often go undetected in routine microbiology laboratories, making speciation essential for appropriate treatment to prevent mortality in NICUs. Accurate identification and targeted management are vital for improving outcomes in these vulnerable patients. This case series underscores the necessity of vigilant monitoring and targeted management to combat non-albicans candidiasis in vulnerable neonatal populations.

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