Clinical and microbiological study of Neonatal systemic candidiasis in a tertiary care centre

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ABSTRACT

Background: There is an upsurge of neonatal systemic candidiasis. This can also be viewed in the perspective of increased survival rate of neonates with low birth weight. A large number of risk factors are associated with it manifesting clinically in varied way. Early institution of antifungal treatment is priority to save life.

Aim: To identify the species of candida causing neonatal sepsis; assess the pattern and to correlate the various risk factors and clinical presentations and to determine the antifungal susceptibility.

Methods: A cross sectional study was conducted during Aug, 2013 to Jan'2014; including 800 cases of clinically suspected septicemia in neonates. Institutional ethical clearance was obtained. The blood samples were subjected to haematology and then processed to culture.

Result: *Candida glabrata* (39%) was the predominant NAC species followed The common risk factors included Low-birth weight and prematurity. Candida species were sensitive to all antifungal drugs tested except for *Candida krusei.*

Conclusion: The susceptibility to antifungal agents varies among Candida spp. Hence there is a need to identify Candida up to species level.

Keywords: candidiasis, septicaemia, antifungal

INTRODUCTION

Infections due to Candida species attributes 2% of early onset sepsis and 12% of late onset sepsis.[1] Risk factors for invasive infections due to *Candida* species are low birth weight , prematurity , infants on central vascular catheters ,endotracheal tubes, broad-spectrum antibiotic therapy , postnatal steroids , and parenteral nutrition.[2,3]

Fungal infections in preterm neonates are mostly due to *Candida* species.[4] *Candida* species are commensal organisms that colonize on the skin and mucosal surfaces and adhere to the catheter surfaces. *Candida albicans* and *Candida parapsilosis* account for 80-90% of infections.[5] *Candida* can invade the bloodstream and disseminate in infants.

The clinical manifestations of sepsis due to *Candida* species include respiratory insufficiency, apnea, bradycardia, temperature instability, feeding intolerance and abdominal distension. Infection control, prophylaxis, and aggressive treatment (antifungal therapy and central catheter removal) is required to improve the outcome .[6,7]

MATERIALS AND METHODS

This observational cross-sectional study was carried out at Department of Microbiology, Kasturba Medical College, and Mangalore during Aug'2013 to Jan'2014. It included 800 cases of clinically suspected septicemia in neonates. The findings of TLC, DLC, ESR, CRP, CSF examination were noted. The blood sample was inoculated in the BacT/ALERT 3D pediatric culture bottle and incubated in an automated microbial detection system (bioMerieux) at 37 °C. Positive bottles were subcultured on sheep blood agar, MacConkey agar plates and Sabouraud dextrose agar slant with antibiotics but without cycloheximide (Hi-Media Pvt. Ltd., Mumbai, India). Candida species isolated was

identified by germ tube test and growth on CHROM agar and Vitek compact 2 systems. Antifungal susceptibility was determined using the Vitek 2 system. The proportions were analyzed by using the Chi square test.

RESULTS

Blood culture was found positive in 42% cases. Pure growth of Candida species was isolated from 30.1% cases. *Candida glabrata* (39%) was the predominant NAC species followed by *C. tropicalis* (26.4%), *C. parapsilosis* (14.5%), *C. guilliermondii* (2.7%), *C. krusei* (1.8%), *C. dubliniensis* (0.9%) and *C. lusitaniae* (0.9%). The common risk factors included Low-birth weight and prematurity.

Candida species were sensitive to all antifungal drugs tested except for *Candida krusei w*hich was inherently resistant to fluconazole and 2 isolates of *C.krusei* showed intermediate susceptibility to flucytosine.

DISCUSSION

The incidence of infections due to Candida spp. is on rise especially in patients admitted in tertiary care hospitals. Neonatal septicemia due to Candida spp. was reported in 30.1% of cases in previous studies. In this study , number of cases of neonatal candidemia due to non albicans Candida species is more than due to C albicans, consistent with the previous studies.[8,9] The susceptibility to antifungal agents varies among Candida spp. NAC species, especially *C. tropicalis*, *C. krusei*, *C. glabrata* , are less-susceptible to azoles: fluconazole, than *C. albicans*. *C. krusei* is innately resistant to fluconazole. Our study showed 100% sensitivity of Candida species to amphotericin B and voriconazole. Resistance to fluconazole, flucytosine was seen in Candida krusei. Other studies have reported 92% sensitivity to AMB, 36% to FLU,24% to ITR,56%to VOR,96% to FCy .[10] Hence there is a need to identify Candida up to species level.

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