

CANDIDA BLOOD STREAM INFECTIONS IN NEONATES

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ABSTRACT

Candida spp. are known to be the most common fungal pathogens isolated from blood cultures of neonates. The present study was undertaken to know the prevalence of candidemia in neonates and their antifungal susceptibility pattern. *Candida* isolates were speciated by using germ tube, carbohydrate assimilation and fermentation tests, CHROM agar and Dalmau plate culture method. Antifungal susceptibility testing to amphotericin B and fluconazole was done using E-test. A total of 56 *Candida* isolates were obtained over a period of one year from neonates. Of these 42 isolates were non-albicans *Candida*. All the isolates were sensitive to amphotericin B. Fluconazole was more commonly observed in non-albicans *Candida*. *Candida* speciation as well as antifungal susceptibility pattern need to be studied, especially in light of increasing drug resistance and newer antifungals to be evaluated for therapy.

KEY WORDS

Candida , neonates, non-albicans *Candida*

INTRODUCTION

The frequency of candidemia has increased dramatically over the past few decades accounting for 8-10% of all nosocomial blood stream infections.¹ Recent reports^{2,3,4} from our country indicate a trend towards an increasing prevalence of non-albicans candidemia. *Candida* species possess a number of virulence factors which enable the organism to cause haematogenously disseminated infections in susceptible hosts with increased morbidity and mortality. Such infections are mostly observed in hospitals, mainly from intensive care units (ICUs), oncology units, organ transplants units etc, where most patients are subjected to heavy therapeutic protocols and are immunodeficient. The present study was undertaken to know the prevalence of candidemia in neonates and their antifungal susceptibility pattern.

MATERIALS AND METHODS

A total of 1312 blood cultures were received in the Deptt. of Microbiology, Pt.BDS,PGIMS, Rohtak, over a period of one year (January 2009 - December 2009) from

newborns. The bottles received were incubated at 37°C and subcultures were made at 24 hrs, 48 hrs, 72 hrs and on seventh day. *Candida* isolates were identified according to standard microbiological procedures.⁵ Speciation of *Candida* isolates were carried out by using germ tube test, Chrom agar, cornmeal agar, carbohydrate assimilation and fermentation tests.⁵ Antifungal susceptibility to fluconazole and amphotericin B was tested using E-test (HiMedia). The MIC of <0.5 mg/lit was taken as sensitive for amphotericin B and <8 mg/lit for fluconazole.

RESULTS

A total of 56 *Candida* isolates were obtained over a period of one year accounting for 21.4% of all neonatal septicemia cases.

Of the 56 isolates, 25.0% were *Candida albicans*, followed by *C.tropicalis* (35.7%), *C. glabrata* (17.8%), *C. parapsilosis* (16.0%), *C.guilliermondii* (3.5%) and *C.krusei* (1.78%) (Figure).

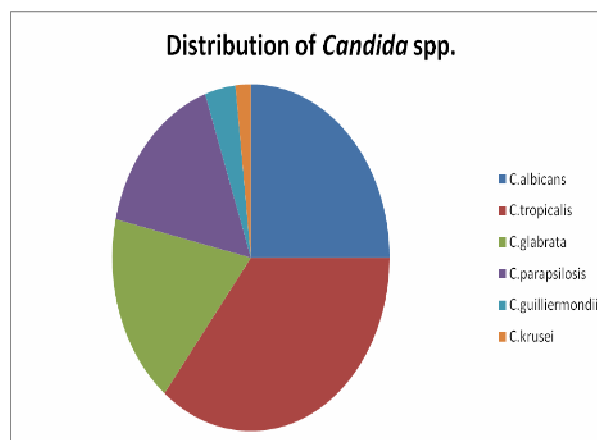


Table enumerates the antifungal resistance pattern to amphotericin B and fluconazole. All the isolates were sensitive to

amphotericin B. Fluconazole resistance was more commonly observed in non-albicans *Candida* isolates (19.04%).

TABLE
Antifungal drug resistance in *Candida* isolates

Isolates	Amphotericin B	Fluconazole
<i>C.albicans</i> (n=14)	-	2(14.28%)
<i>C.tropicalis</i> (n=20)	-	5(25.0%)
<i>C.glabrata</i> (n=10)	-	1(10.0%)
<i>C.parapsilosis</i> (n=9)	-	1(11.11%)
<i>C.guilliermondii</i> (n=2)	-	-
<i>C.krusei</i> (n=1)	-	1(100%)

DISCUSSION

Candida spp. are frequently encountered in the normal microbiota of humans, which facilitates them to invade most implanted biomaterials and host surfaces. They are now the fourth leading cause of bloodstream infections in hospitalized patients.⁶

There are varied reports regarding the prevalence of *C.albicans* and non-albicans *Candida* in bloodstream infections from the Indian sub-continent. Few reports have documented *C.albicans* as the most common isolate from neonates.^{7,8} But in our study, we noted *C.tropicalis* (35.7%) to be the major etiological agent. Our report is in concordance with other reports^{2,3,4} which have showed that non-albicans *Candida* can cause 67-90% of nosocomial candidemias.

The striking feature of the present study was the isolation of *C.parapsilosis* (16.0%) as the third most common among non-albicans *Candida*. Trofa et al⁹ have documented *C.parapsilosis* as an emerging fungal pathogen and a major threat for future especially among neonates in NICU's. They have warned that the

incidence of *C.parapsilosis* may continue to rise as it frequently colonises the hands of health care workers and has high affinity for parenteral nutrition.

In the current study, amphotericin B (100%) was the most effective antifungal agent. In India, amphotericin B is the drug of choice for invasive candidiasis with low or no resistance reports.^{4,7} *Candida* isolates also showed lower resistance rates to fluconazole (17.8%) in our study making it still an useful antifungal agent which is in agreement with others.⁸ Though there are various reports from our country showing increasing trend towards fluconazole resistance especially among non-albicans *Candida* which warrants its judicious use as a prophylactic agent in hospitals.

To conclude, our study highlights that within our country the epidemiology of neonatal candidemia differs markedly and therefore it is important for every setting to speciate and perform the antifungal susceptibility testing. This information will help us to recognize the emerging fungal pathogens and increasing drug resistance.



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