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Original Research Paper

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NEONATAL BLOODSTREAM INFECTIONS BY CANDIDA: CANDIDATES AND THEIR SUSCEPTIBILITY TO ANTIFUNGALS.

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ABSTRACT *Candida* spp. are the most frequent cause of opportunistic fungal infections in children as well as the third most common cause of pediatric healthcare associated bloodstream infection worldwide. Recent concern has centered on the increasing proportion of candidemia episodes caused by non-albicans *Candida* spp. given their association with fluconazole resistance patterns. This study identified different species of *Candida* from neonates admitted with blood stream *Candida* infections, and their antifungal susceptibility patterns were determined using Hexaantimyco -01 (HiMedia). In the present study NAC species accounted for 100% of the cases of neonatal candidemia, with *C. albicans* scoring a total zero. The ominous feature that came out is that only Itraconazole showed a good sensitivity pattern among all the antifungals.

KEYWORDS : Neonates, Candidemia, non-albicans, Antifungals.

INTRODUCTION

Candida spp. remain the most frequent cause of opportunistic fungal infections in children as well as the third most common cause of pediatric healthcare associated bloodstream infection worldwide.[1] Magnitude of the problem in candidemia is such that it possesses an international threat. International data at a glance is as follows: in USA rate of candidemia amounts to 0.8/1000 discharges, in Europe 0.2 – 0.5/1000 discharges and in Australia 0.09-0.36/1000 admissions, whereas Indian data indicates higher rate compared to developed world:1-12/1000admissions.[2-4] Recent concern has centered on the increasing proportion of candidemia episodes caused by non-albicans *Candida* spp. Given their association with fluconazole resistance.[5] Nature of candidemia differs widely across globe. Indian *Candida* epidemiology is distinct, unique and highly adaptive. Western data may be totally irrelevant to India. In the present study we have tried to identify different species of *Candida* from patients admitted with neonatal bloodstream *Candida* infections, and to study their antifungal susceptibility patterns.

MATERIALS AND METHODS

A total of 26 blood culture (in Trypticase soy broth) samples were taken from which pure growth of *Candida* could be isolated. The *Candida* sp were inoculated onto HiCrome *Candida* differential Agar (HiMedia),recommended as a useful isolation medium capable of the presumptive identification of the yeast species most commonly isolated from clinical material land facilitating recognition of mixed yeast cultures.[6] According to the colony colours the speciation was done as specified in the literature. After identification antifungal sensitivity was done using Hexaantimyco -01 (HiMedia).

Blood Culture	*Candida* spp.	Itraconazole	Fluconazole	Clotrimazole	Amphotericin B	Nystatin	Ketoconazole
1	*C. krusei*	S	S	S	S	S	S
2	*C. krusei*	S	R	R	R	R	R
3	*C. krusei*	S	R	R	R	R	R
4	*C. krusei*	S	R	R	R	R	R
5	*C. krusei*	S	R	R	R	R	R
6	*C. krusei*	S	R	R	R	R	R
7	*C. krusei*	S	R	R	R	R	R
8	*C. krusei*	R	R	R	R	R	R
9	*C. krusei*	S	R	S	S	S	S
10	*C. krusei*	S	R	R	R	R	R
11	*C. krusei*	S	R	R	R	R	R
12	*C. krusei*	S	R	R	R	R	R
13	*C. tropicalis*	S	R	S	R	R	R
14	*C. tropicalis*	S	R	R	R	R	R
15	*C. krusei*	S	S	S	S	S	S
16	*C. krusei*	S	R	R	R	R	R
17	*C. krusei*	S	R	R	R	R	R
18	*C. tropicalis*	S	R	R	R	R	R
19	*C. tropicalis*	S	R	R	R	R	R

20	*C. krusei*	S	R	R	R	R	R
21	*C. krusei*	S	R	R	R	R	R
22	*C. krusei*	S	S	S	S	S	S
23	*C. krusei*	S	R	R	R	R	R
24	*C. krusei*	S	R	R	R	R	R
25	*C. krusei*	S	R	R	R	R	R
26	*C. krusei*	S	S	S	S	S	S

RESULTS

1) Out of 26 blood culture isolates all were non-albicans *Candida* spp.
2) *C. krusei* was most common – 22 out of 26 isolates (84.6%).
3) Rest were *C. tropicalis*- 4 out of 26 isolates (15.3%).
4) All the isolates are uniformly sensitive to Itraconazole except one.
5) Amost all the isolates show a resistance pattern to all the other antifungals .

DISCUSSION

In last few years, pediatrics cases due to Non-Albicans *Candida* (NAC) have increased markedly.[7] International studies found infection with *C. parapsilosis* (22%) was common in younger patients, while *C. glabrata* (11%) was prevalent in older children and adults.[8] In contrast to the international scenario, *C. tropicalis* and *C. parapsilosis* emerged as the predominating NAC in India.[9] In the present study NAC species accounted for 100% of the cases of neonatal candidemia, with *C. albicans* scoring a total zero. Striking feature of the present study was isolation of *C. krusei* (84.6%) as the most common NAC species followed by *C. tropicalis* (15.3%) - the so called predominant NAC in Indian subcontinent. The ominous feature that came out is that only Itraconazole shows a good sensitivity pattern – rest of the antifungal are more or less ineffective against the isolates.

CONCLUSION

Candidemia in neonates is an ominous prognostic sign and is an important entity in our hospital. Preventive measures such as use of filters for parenteral nutrition, prophylactic antifungal use, and a restrictive policy of antibiotic use to decrease *Candida* colonization/infection rates should be implemented to reduce the morbidity and mortality associated with these infections.

REFERENCES

[1] Wisplinghoff H, Seifert H, Tallent SM, et al. Nosocomial bloodstream infections in pediatric patients in United States hospitals: epidemiology, clinicalfeatures and susceptibilities. Pediatr Infect Dis J 2003;22:686-91.)
[2] Hajje RA, Sofair AN, Harrison LH et al. Incidence of bloodstream infections due to Candida species and in vitro susceptibilities of isolates collected from 1998 to 2000 in a population-based active surveillance program.J ClinMicrobiol.2004 Apr;42(4):1519-27.
[3] BentioAlmarante, DolorsRodrfguez, Benjamin J Park et al. Epidemiology and Predictors of Mortality in Cases of Candida Bloodstream Infection: Results from Population-Based Surveillance, Barcelona, Spain, from 2002 to 2003. J ClinMicrobiol.2005; 43:1829 & 4434.
[4] Chakraborty A, Chatterjee SS, Shivaprakash MR. Overview of opportunistic fungal infections in India .Jpn J Med Mycol. 2008;49:165.
[5] Ostrosky-Zeichner L, Pappas P. "Invasive Candidiasis in the intensive care unit." Crit Care Med. 2006; 34:857- 863.
[6] Odds FC, Bernaerts R. J ClinMicrobiol. 1994 Aug;32(8):1923-29.
[7] Sobel JD. The emergence of non-albicans Candida species as causes of invasive Candidiasis and candidemia.Curr Infect Dis Rep 2006;8:427-33.
[8] Steinbach WJ, Roilides E, Berman D, et al. Results from a prospective, international, epidemiologic study of invasive candidiasis in children and neonates. Pediatr Infect Dis J 2012;31:1252-7.
[9] Singhi SC, Reddy RT, Chakrabarti A. Candidemia in pediatric intensive care unit. PaediatrCrit Care Med 2004;5:369-74.