

New Threat in Newborns: Multiresistant Non-Albicans Candidemia

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Abstract: *Candida species remain the most frequent cause of opportunistic fungal infections in children as well as the third most common cause of paediatric healthcare associated bloodstream infection worldwide. Recent concern has centred 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 Hexaantimyc -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, NAC, Antifungals.

1. Introduction

Candida species remain the most frequent cause of opportunistic fungal infections in children as well as the third most common cause of paediatric healthcare associated bloodstream infection worldwide. (Ref: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 (Ref 2), in Europe 0.2 – 0.5/1000 discharges (Ref 3) and in Australia 0.09-0.36/1000 admissions, whereas Indian data indicates higher rate compared to developed world: 1-12/1000 admissions (Ref 4).

Recent concern has centred on the increasing proportion of candidemia episodes caused by non-albicans Candida spp. Given their association with fluconazole resistance (Ref 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.

2. 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 and facilitating recognition of mixed yeast cultures (Ref 6).

According to the colony colours the speciation was done as specified in the literature. After identification antifungal sensitivity was done using Hexaantimyc -01 (HiMedia).

Table 1: Pathogens and their antifungal susceptibility patterns. (at the end)

Blood Culture	Fungus	Itraconazole	Flu Conazole	Clo Trimazolec	Ampho Tericin B	Nystatin	Keto Conazole
1	<i>C krusei</i>	S	S	S	S	S	S
2	<i>C krusei</i>	S	R	R	R	R	R
3	<i>C krusei</i>	S	R	R	R	R	R
4	<i>C krusei</i>	S	R	R	R	R	R
5	<i>C krusei</i>	S	R	R	R	R	R
6	<i>C krusei</i>	S	R	R	R	R	R
7	<i>C krusei</i>	S	R	R	R	R	R
8	<i>C krusei</i>	R	R	R	R	R	R
9	<i>C krusei</i>	S	R	S	S	S	S
10	<i>C krusei</i>	S	R	R	R	R	R
11	<i>C krusei</i>	S	R	R	R	R	R
12	<i>C krusei</i>	S	R	R	R	R	R
13	<i>C tropicalis</i>	S	R	S	R	R	R
14	<i>C tropicalis</i>	S	R	R	R	R	R

15	<i>C krusei</i>	S	S	S	S	S	S
16	<i>C krusei</i>	S	R	R	R	R	R
17	<i>C krusei</i>	S	R	R	R	R	R
18	<i>C tropicalis</i>	S	R	R	R	R	R
19	<i>C tropicalis</i>	S	R	R	R	R	R
20	<i>C krusei</i>	S	R	R	R	R	R
21	<i>C krusei</i>	S	R	R	R	R	R
22	<i>C krusei</i>	S	S	S	S	S	S
23	<i>C krusei</i>	S	R	R	R	R	R
24	<i>C krusei</i>	S	R	R	R	R	R
25	<i>C krusei</i>	S	R	R	R	R	R
26	<i>C krusei</i>	S	S	S	S	S	S

3. Results

- 1) Out of 26 blood culture isolates all were non-albicans candida.
- 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) Almost all the isolates show a resistance pattern to all the other antifungals .

4. Discussion

In last few years, paediatrics cases due to Non-Albicans Candida (NAC) have increased markedly (Ref 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. (Ref 8). In contrast to the international scenario, *C tropicalis* and *C parapsilosis* emerged as the predominating NAC in India. (Ref 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.

5. 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.

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