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CANDIDA SPP. OTHER THAN CANDIDA ALBICANS: A MAJOR CAUSE OF FUNGAEMIA IN A TERTIARY CARE CENTRE

*S Shivaprakasha, K Radhakrishnan, PMS Karim

Abstract

This study was conducted to determine the frequency of different Candida spp. isolated from different parts of the hospital, associated risk factors and mortality rate. A total of 59 cases were selected for prospective analysis over a period of one and half years. Blood samples collected were processed by BACTEC (9240) method. Candidaemia was diagnosed by isolation of blood culture at least from two blood culture samples or from a clinically significant single blood culture sample. Candida spp. were identified by standard techniques. Most frequent isolates were C. tropicalis (35.6%), C. parapsilosis (28.8%), C. glabrata (11.9%) and C. pelliculosa (11.9%). Candida albicans was isolated only in 3.4% cases. Neutrology department accounted for highest number of isolates (27.1%), followed by gastrointestinal surgery (15.3%) and cardiac surgery (13.6%). Mortality was noted in 16.9%. Probable risk factors determined were intensive care unit stay (74.6%), antibiotic therapy (50.8%), central line (42.4%), ventilator (23.7%), central line (42.4%), central line (42.4%), central line (42.4%).

Materials and Methods

Candidaemia was diagnosed by isolation of Candida spp. from at least two blood culture samples or from a clinically significant single blood culture sample among hospitalized patients. Prospective study was conducted over one and half years, and 59 cases of candidaemia were selected. Patient’s demographic features such as age, sex, location, date of admission, dates on which results of blood culture were positive, underlying illness, associated risk factors such as central line insertion, presence of urinary catheter, respiratory ventilation, duration of antibiotic therapy and antifungal prophylaxis if any, were considered. All the cases were followed up for one month and mortality was noted. Death attributed to candidaemia was defined as death which occurred ≤48 h after a blood culture positive for Candida spp., persistent candidiasis at clinical sites, and indication by clinician that candidiasis significantly contributed to death.

Blood samples collected were processed by BACTEC (9240). Samples that flagged positive for yeast species were cultured on Sabouraud dextrose agar. Speciation was done by germ tube test, sugar assimilation test, morphology on corn base glucose agar by disc diffusion method. Statistical analysis was done using SPSS (Statistical Package for Social Sciences) version 11. Categorical variables were reported by using frequencies. To test the statistical significance of the association of mortality with different factors, Fisher’s exact test was done and the exact P-values were obtained (P < 0.05 was considered significant).

Results

A total of 59 cases of candidaemia were selected for analysis. Apart from Candida spp., other yeast species isolated during this period were three Trichosporon spp. and Cryptococcus neoformans from an HIV positive patient.
Male predominance was noted in (n = 42/59) 71.2%. Candidaemia was associated more frequently with infants (n = 26/59) 44% and ≥40-year age group (n = 14/59) 23.7%. Neonatology department (27.1%) accounted for highest number of isolates followed by gastrointestinal surgery (15.3%) and cardiac surgery 13.6% (Table 1). Most frequent isolates were C. tropicalis 35.6%, C. parapsilosis 28.8%, C. glabrata 11.9% and C. pelliculosa 11.9% (Table 2).

Common isolates from neonatal intensive care unit were C. pelliculosa (n = 5/16, 31.3%) and C. glabrata (n = 5/16, 31.3%). From gastrointestinal surgery, C. parapsilosis (n = 4/9, 44.4%) and C. tropicalis (n = 4/9 44.4%) were common. From cardiac surgery, C. tropicalis (n = 4/8, 50%) were common. Maximum number of isolates were from intensive care unit (n = 44/59, 74.6%). All isolates of C. glabrata (100%), C. tropicalis (76.1%) and C. pelliculosa (85.7%) were from intensive care units. There was not much difference in isolation rate, between ward and intensive care unit for C. parapsilosis.

Probable risk factors determined were intensive care unit stay (n = 44/59, 74.6%), antibiotic therapy (n = 30/59, 50.8%), central line (n = 25/59, 42.4%), urinary catheter (n = 19/59, 32.2%), ventilator (n = 14/59, 23.7%), malignancy (n = 12/59, 20.3%) and abdominal surgery (n = 9/59, 15.3%). Overall mortality was noted in (n = 10/59, 16.9%). Three patients died before instituting antifungal therapy and seven patients (11.8%) died after institution of antifungal therapy (P = 0.004). Eight patients were in the age group of ≥40 years (P = 0.013).

**Discussion**

Our study shows that there is emergence of *Candida* spp. other than *C. albicans* as a major cause of candidaemia. Other Indian studies also have documented shift to these species, *C. tropicalis* being the most commonly isolated. Emergence of *Candida* spp. other than *C. albicans* is due to selection of less susceptible species by the pressure of antifungal agent such as fluconazole apart from associated risk factors and underlying disorders.

In our study, we observed that intensive care unit stay, antibiotics and central line played a major role in development of candidaemia. Univariate analysis of these probable risk factors against the species was statistically not significant. This is probably due to smaller number of cases studied.

*Candida tropicalis* was the most frequent isolate in our study. Recent data have shown that *C. tropicalis* is the second or third leading cause of candidaemia in adults, especially in patients with lymphoma, leukaemia and diabetes mellitus. *Candida parapsilosis* has been isolated from HCW's hands, particularly of those working in neonatal ICUs. *Candida parapsilosis* has been associated with endemic and epidemic nosocomial infections traced to total parenteral nutrition or intravascular devices.

*Candida glabrata* and *C. pelliculosa* are the common species responsible for neonatal septicemia in our study. Common underlying illness among neonates was septicaemia and respiratory distress syndrome. Low birth weight was noted in n = 4/16 (25%) and preterm in n = 5/16 (31.25%). *Candida glabrata* shows increased innate resistance to antifungal agents, specifically the azoles. According to several investigators, the increase in the frequency of *C. glabrata* infections has paralleled the increased use of fluconazole in some hospitals. In a more recent study, however, investigators described the association between *C. glabrata* infection and amphotericin B use rather than fluconazole. In our study, only four patients who developed candidaemia were on fluconazole prophylaxis and none of these infections were due to *C. glabrata*.

*Candida pelliculosa*, a rare clinical isolate, has been implicated in an outbreak of nosocomial fungaemia in paediatric patients and from neonatal intensive care units. Further studies are required on these aspects at our centre.

Mortality attributable to candidaemia reported from other studies is 12-38%. In our study, we noted 16.9% mortality. Age group ≥ 40 years (32% vs. 5.9%) was significantly associated with mortality compared to age group < 40 years.
years. It is well-established fact that \textit{C. albicans} is more virulent than other \textit{Candida} spp.\textsuperscript{18} In our study, there was no significant association of mortality with different species. This could be due to smaller number of cases studied.

From our study we are of the opinion that, of the fungal pathogens, \textit{Candida} spp. other than \textit{C. albicans} are a major cause of morbidity in hospitalized patients. Early antifungal therapy improves the outcome.

References


