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ORIGINAL ARTICLE

Assessment of candidiasis in Pediatric intensive care units - A clinical study

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ABSTRACT:
Background: Candida species are the leading cause of invasive fungal infections in hospitalized children and are the third most common isolates recovered from pediatric cases of health care associated bloodstream infection.
Materials & Methods: 102 pediatric patients of both genders admitted to intensive care unit were involved. A case of candidemia was defined as one or more positive blood cultures obtained by a peripheral venipuncture or through an indwelling central venous catheter (CVC) that yielded growth of any candida species.
Results: Age group 1-5 years had 28, 5-10 years had 50 and >10 years had 24 patients. The difference was significant (P< 0.05). Underlying diseases were respiratory tract diseases were 30, neurological diseases were 24, CVDs were 16 and chronic liver diseases were 32. The difference was significant (P< 0.05). ETT intubation was seen in 74, mechanical ventilation >7 days was seen in 68, PICU stay >15 days in 80 and total mortality in 35 pediatric patients. The difference was significant (P< 0.05).
Conclusion: There was hight mortality in pediatric ICU patients suffered from candidiasis.
Key words: Children, Candidiasis, ICU**.**

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INTRODUCTION

Candida species are the leading cause of invasive fungal infections in hospitalized children and are the third most common isolates recovered from pediatric cases of health care associated bloodstream infection. Candidemia is frequently associated with signs and symptoms of sepsis syndrome.[1] The annual number of cases of sepsis caused by fungal organisms increased by 207% between 1979 and 2000.[2] Fungal infections possess the second highest case fatality rate (13%) among all causes of sepsis in children. The attributable mortality of candidemia in children has been reported to be 10%. In children, candidemia is associated with prolonged hospital length of stay (median=21 days) and hospital charges. Pediatric intensive care unit (PICU) patients are at highest risk for death due to candidemia.[3] Although Candida albicans is still the main Candida sp. associated with ICI in children, a strong trend toward the emergence of Candida non-albicans has been observed. This could be linked to the use of fluconazole prophylaxis in some patients.[4] The epidemiology/ risk factors for IFI are quite different between previously healthy children hospitalized in the pediatric intensive care unit (PICU) and children whose hospitalization is related to malignancy or a severe hematological disease (leukemia). Indeed, in the second group, the reported incidence is approximately 5% with a mortality rate of approximately 60%.[5] The present study was conducted to assess candidal infection in pediatric intensive care unit.

MATERIALS & METHODS

The present study was conducted among 102 pediatric patients of both genders admitted to intensive care unit. Consent from parents was obtained.

A case of candidemia was defined as one or more positive blood cultures obtained by a peripheral venipuncture or through an indwelling central venous catheter (CVC) that yielded growth of any Candida species Mortality was defined as death within 30 days after the onset of candidemia. Parameters such as length of stay in the PICU, neutropenia, need and duration of mechanical ventilation (MV) and (ETT) intubation, types and duration of administered broad-spectrum antimicrobial agents, use of antifungal therapy, corticosteroids, and total parenteral nutrition (TPN) and outcome was recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Number	P value
1-5	28	0.04
5-10	50	
>10	24	

Table I shows that age group 1-5 years had 28, 5-10 years had 50 and >10 years had 24 patients. The difference was significant (P< 0.05).

Table II Underlying chronic diseases

Diseases	Number	P value
Respiratory tract disease	30	0.05
Neurological diseases	24	
CVDs	16	
CLD	32	

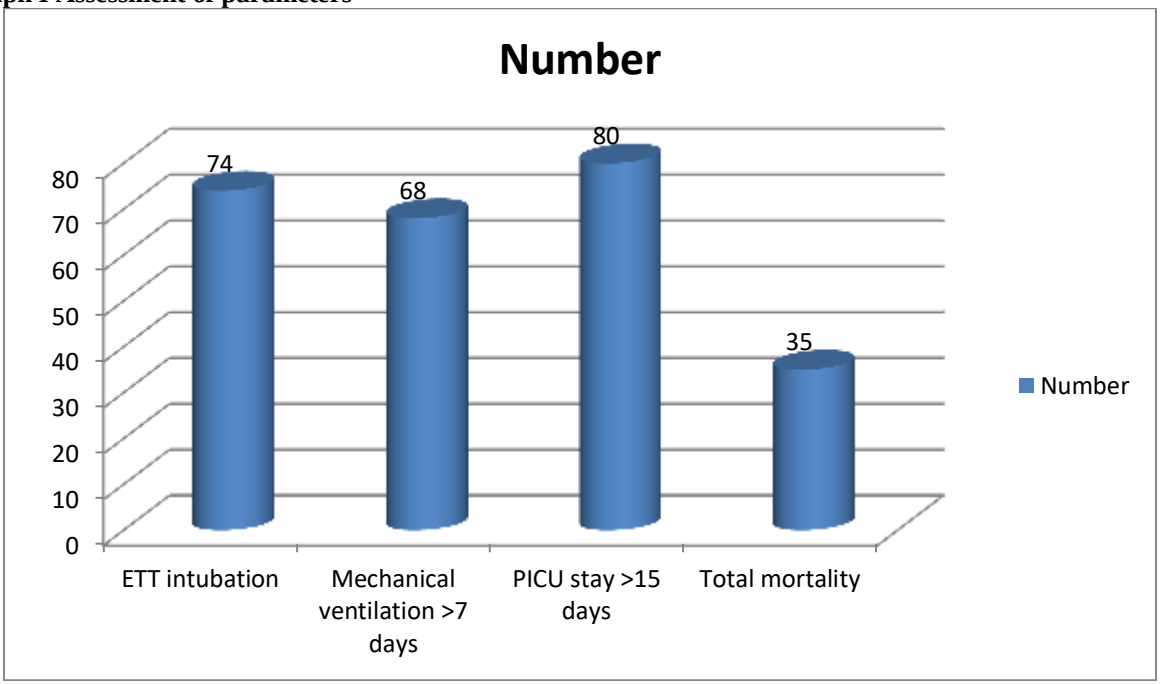
Table II shows that underlying diseases were respiratory tract diseases were 30, neurological diseases were 24, CVDs were 16 and chronic liver diseases were 32. The difference was significant (P< 0.05).

Table III Assessment of parameters

Diseases	Number	P value
ETT intubation	74	0.03
Mechanical ventilation >7 days	68	
PICU stay >15 days	80	
Total mortality	35	

Table III, graph I shows that ETT intubation was seen in 74, mechanical ventilation >7 days was seen in 68, PICU stay >15 days in 80 and total mortality in 35 pediatric patients. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Candida blood stream infections (BSIs) are of particular concern for immunocompromised patients, patients in intensive care settings, patients with central lines, and patients receiving parenteral nutrition and/or broad-spectrum antibiotics for a prolonged period of time.[6] Candidemia is often associated with signs and symptoms of sepsis and fungal infections represent the second highest case-fatality rate (13%) among all causes of sepsis in children. For many years, Candida albicans (CA) was the principal pathogenic species isolated from blood.[7] However, an increasing role of non-albicans Candida (NAC) species, some of which are intrinsically or potentially resistant to antifungal agents, has been observed. NAC species, particularly C. parapsilosis and C. tropicalis, account for almost half of invasive Candida infections in pediatric patients.[8] Non-albicans Candidabecame more frequent causative agents for invasive fungal infections in the ICU with high transmission of C. parapsilosis.[9] The present study was conducted to assess candidal infection in pediatric intensive care unit.

In present study, age group 1-5 years had 28, 5-10 years had 50 and >10 years had 24 patients. Zaoutis et al[10] identified 101 case patients with candidemia (incidence, 3.5 cases per 1000 PICU admissions). Factors independently associated with candidemia included presence of a central venous catheter (odds ratio [OR], 30.4; 95% confidence interval [CI], 7.7-119.5), malignancy (OR, 4.0; 95% CI, 1.23-13.1), use of vancomycin for >3 days in the prior 2 weeks (OR, 6.2; 95% CI, 2.4-16), and receipt of agents with activity against anaerobic organisms for >3 days in the prior 2 weeks. Predicted probability of having various combinations of the aforementioned factors ranged from 10.7% to 46%. The 30-day mortality rate was 44% among case patients and 14% among control patients.

We found that underlying diseases were respiratory tract diseases were 30, neurological diseases were 24, CVDs were 16 and chronic liver diseases were 32. Hegazi et al[11] in their study sixty-six patients without prior fluconazole prophylaxis had 88 episodes of candidemia, representing 19% of all cases with blood stream infections (BSIs). Candida albicans (CA) and non-albicans Candida(NAC) species accounted for 40% and 60% of candidemia episodes respectively. C. parapsilosis, C. tropicalis, and C. glabrata accounted for 25%, 17%, and 8% of NAC candidemias respectively. Fluconazole resistance was detected in 11.4% and 18.9% of CA and NAC isolates respectively. Of the fluconazole resistant NAC isolates, four were C. krusei. Amphotericin B resistance was detected in 17% of NAC isolates. Candida colonization was detected in 78.8% of patients. Compared to CA candidemia, higher risk for NAC candidemia was associated with age older than 1 year. Candida isolation from endotracheal tube (ETT) and from central venous catheter. Mortality rate was 42.4%,attributable mortality of candidemia was 16.7%. Regression analysis showed that the most significant independent predictors of death were ETT and mechanical ventilation (MV), MV longer than 7 days, and candiduria.

We found that ETT intubation was seen in 74, mechanical ventilation >7 days was seen in 68, PICU stay >15 days in 80 and total mortality in 35 pediatric patients. Candida surveillance cultures are very useful tools for identifying and properly treating invasive candidiasis in preterm neonates. However, few data have been reported regarding the colonization-infection shift outside the NICU where colonization by Candida species was found to be an independent predictor of candidemia in children undergoing treatment for severe sepsis or sepsis shock in PICU.[12]

CONCLUSION

Authors found that there was hight mortality in pediatric ICU patients suffered from candidiasis.

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