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RESEARCH ARTICLE
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TRENDS IN PAEDIATRIC CANDIDEMIA: ITS PREVALENCE AND SPECIES DISTRIBUTION.

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Background- Candidemia poses the greatest threat with a high fatality rate among children of all blood stream infections (BSI), Candidemia is defined as the presence of Candida species in the blood determined by at least one positive blood culture in patients with fever and signs of a blood stream infection (BSI). The present study aimed to demonstrate the prevalence of candidemia among children.
Methodology -
Study design- Prospective cross-sectional study
Study Centre- Microbiology Laboratory, Bundelkhand Medical College, Sagar, Madhya Pradesh.
Study duration- January to december 2022.
Methods and material- Microorganism were isolated from blood samples of children age group 0-10 years and identified via standard microbiological procedures. Chromogenic media was used to isolate and identify the Candida species.
Result- Among the 1022 paediatric blood cultures sent to the microbiology laboratory in 2022, 296 (29.1%) were positive for different microorganisms; with 49/296 (17.2%) positive for Candida.
Conclusion- The prevalence of candidemia was high, the fatality rate was alarming and non Candida albicans species were predominant.

Keywords-: Paediatric, candidemia, chromogenic agar.

INTRODUCTION

Candida species are a type of fungi that can naturally colonize the skin, gastrointestinal mucosa, and genitourinary tract. sometimes, they can also become pathogenic agents depending on imbalances in their microbiota and their association with comorbidities4, 8. Nevertheless, in specific cases, they can enter the bloodstream such as in patients who are immunosuppressed, in intensive care or have local infections, mainly due to the presence of invasive devices[7]. Candidemia is defined as the presence of Candida species in the blood determined by at least one positive blood culture in patients with fever and signs of a blood stream infection (BSI).[3]Invasive candidiasis is a life-threatening condition that endangers critically ill patients and is associated with a high fatality rate. The mortality

rate is unacceptably high, ranging from 29% to 76%.[1] Neonates, elderly patients and those admitted to intensive care units (ICUs) are at greater risk of death than other categories of patients.[2] Risk factors for candidemia in paediatric patients include antibiotic exposure, corticosteroid therapy, the presence of a central venous catheter (CVC), neutropenia, prior fungal colonisation, and intensive care unit (ICU) admission [6, 7]. Additional risk factors are present during the neonatal period including prematurity, low birth weight (LBW), and related co-morbidities, including total parenteral nutrition (TPN), respiratory disease and mechanical ventilation [6, 8, 9]. Neonates and patients with immune dysfunctions are the main groups affected by candidemia, which is especially important in critically ill patients due to the risks imposed on them[4]. Therefore, identifying the main agents, risk factors, and other associated factors is essential for the propaedeutic determination of the follow-up of these patients. A small number of studies have analysed mortality risk factors among children in Brazil. One of them, conducted in the southwest of the country, identified risk factors such as mechanical ventilation and dialysis. Clinical outcomes such as sepsis, septic shock, and comorbidities such as acute renal insufficiency were associated with increased mortality[12]. Another study, conducted in the south of Brazil, identified clinical characteristics such as male sex, stay in the intensive care unit, and thrombocytopenia. Comorbidities such as cardiovascular disease and renal insufficiency; and risks such as mechanical ventilation and dialysis were associated with increased mortality[16]. The early identification of risk factors, Candida species, and susceptibility to antifungals will enable the early implementation of adequate propaedeutics to ensure better outcomes for patients. So this study aimed to estimate the incidence and risk mortality factors of Candida BSIs in a children's public hospital of Sao Paulo, Brazil.

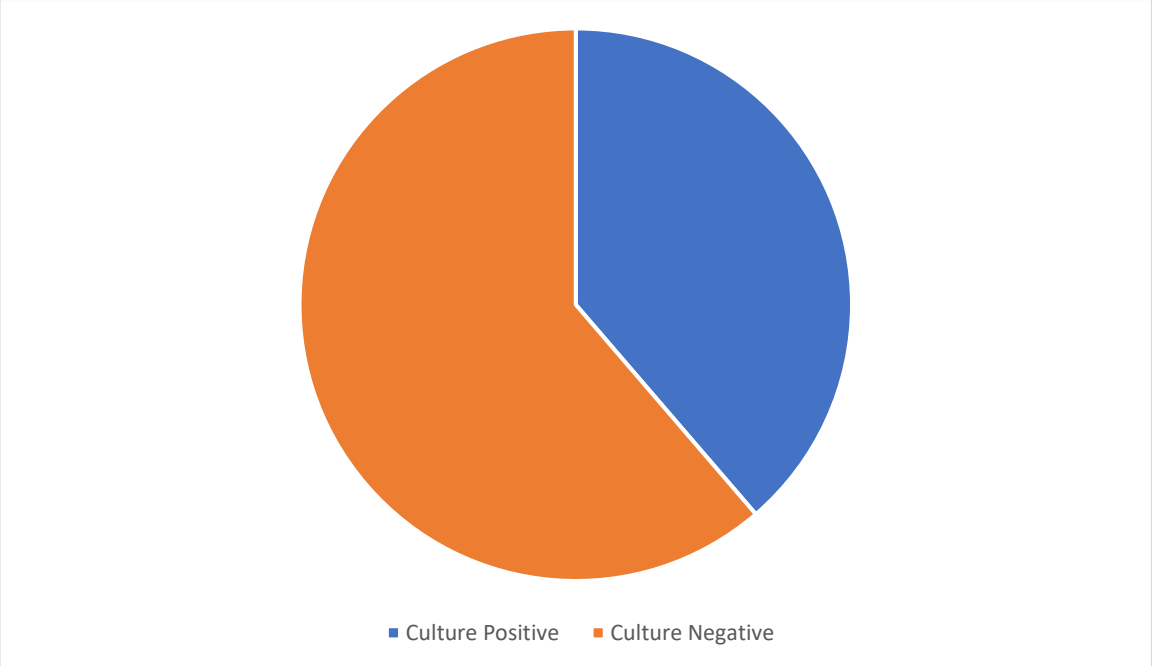
MATERIAL AND METHODS

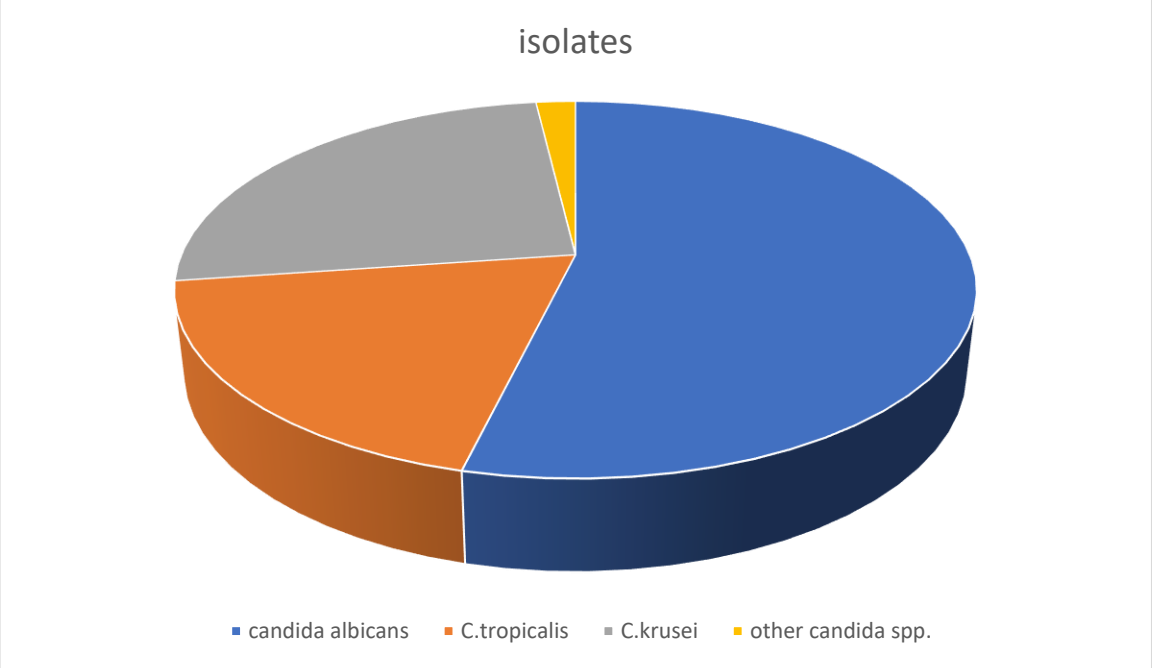
Study Design: This was a single centre, hospital (in-patient) based, Prospective cross-sectional study done in Department of Microbiology, Bundelkhand Medical College, and affiliated hospitals, Sagar, Madhya Pradesh. It is a tertiary care institute.The total duration of the study was twelve months; from January 2022 to december 2022.

Collection of sample for assessment and identification of isolates: total 1022 paediatric blood cultures of patients 0-10 year of age were sent to the microbiology laboratory , The blood samples were delivered to the laboratory in pediatric blood culture bottles and microbial growth was detected by measuring the signal production with an automated Bact/Alert system .Subculturing of the positive blood cultures was performed on blood, chocolate and MacConkey agar to isolate bacteria and on Sabouraud dextrose medium to isolate fungi.[9,10] The primary differentiation of the isolated Candida species into C. albicans and non-C. albicans species was determined by germ tube test.[11] Further characterization of the Candida species was performed by subculturing on chromogenic Candida agar, which discriminates among different Candida species by color.

RESULTS AND OBSERVATIONS

Among the 1022 paediatric blood cultures sent to the microbiology laboratory in 2022, 396 were positive blood cultures. In which 328 (83%) were positive for different microorganisms; with 68 (17%) positive for Candida.Among 68 candida species 23(34%) were Candida albicans and 45(66%) were non albicans.





DISCUSSION

Candida BSIs pose a serious threat, especially to vulnerable patients. In the present study, candidaemia accounted for 68 of the 396 confirmed BSIs with a prevalence of 17%. Other studies in Egypt reported candidaemia prevalences of 16% and 19% among pediatric ICU patients with BSIs.[15,16] A higher prevalence of candidaemia (38%) was reported in another study conducted with a different study populations of adult patients in internal medicine wards.[17]The results of the present study agreed with those of another Egyptian study, which reported a predominance of non-C. albicans species (60% non-C. albicans versus 40% C. albicans).[15] This finding was consistent with the results of a study that reported C. albicans and non-C. albicans BSIs in the neonatal ICU of Child Healthcare, with prevalences of 34% vs 66%, respectively.[18] Several studies also reported this pattern in contrast to the results of older published.[6,16,19,20]Another study conducted in Egypt also found that C. tropicalis was the second common non-C. albicans species isolated with a prevalence of 17%; the prevalence rates of C. tropicalis in other studies were 14.8% and 9.6%.[16,19,] However, those

studies; reported C. parapsilosis as the most common non-C. albicans species isolated, while C. krusei was the most common species in the present study.

CONCLUSION

The knowledge of the hospital's flora distribution is extremely important for the implementation of infection control strategies within the institution. Our study highlighted the prevlance of candida species. Moreover, other factors could also be analyzed and together they could help us to draw up guidelines for treating candidemia cases in critically ill patients. Considering that patients diagnosed with candidemia are typically severally ill, requiring intensive care and being equipped with multiple invasive devices, the related factors emphasize the necessity of implementing infection control strategies to effectively prevent candidemia and mitigate unfavorable outcomes. Our study also provides a description of Candida BSI in children in the central india. Further research, particularly prospective studies, is required to provide a complete understanding of the impact of Candida BSI on the childhood population in central india, including detailed molecular characterisation of the Candida isolates.

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