

Prevalence of Candidemia in A Tertiary Care Hospital, Ahmedabad

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Abstract: Background and Objectives: Candida species are the most common cause of fungal infections responsible for superficial, mucocutaneous, and invasive infections. To find out the prevalence of candidemia and antifungal susceptibility pattern of Candida isolates and various risk factors. Materials and Methods: All Candida isolates from blood culture were included in the six months study period from April to September-2016. The isolates were identified by using various phenotypic tests like germ tube test, corn meal agar, carbohydrates assimilation and fermentation tests. The species were also confirmed on chrome agar. Antifungal susceptibility testing was done by disc diffusion methods according to current Clinical and Laboratory Standard Institute (CLSI) guidelines. Results: Out of 3686 Blood Samples, 2048(55.56%) were culture positive. 129(6.29%) of the isolates were Candida species. Most common species identified was Candida parapsilosis. Most isolates were sensitive to Amphotericin B. 21.89% of isolates from blood were azole resistant. Conclusion: Candidemia is emerging as a significant problem in hospitalized patients, especially in ICU setups. Non-albicans Candida species are the major cause of candidemia as found in our study. Multicentric studies are required to know the true prevalence of candidemia and the status of antifungal drug resistance among Candida isolates. [Mistry U NJIRM 2017; 8(2):143-145]

Key Words: Antifungal Susceptibility, Blood Culture, Candidemia

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Introduction: Candida species are the most common cause of fungal infections worldwide. They can cause a great variety of infections, including superficial, mucocutaneous, but they also cause severe invasive infections that can involve virtually any organ. Blood stream infections by Candida are increasingly common and often are associated with high mortality rates. Recently, we have seen an important increase in the frequency of non-albicans species of Candida which are resistant to azoles¹. Nowadays, Candida spp. is known as one of the most frequently isolated pathogens from the blood stream, among hospitalized patients². The reasons for this increase in fungal infections are multifactorial: better clinical evaluation and diagnosis, greater survival for patients with malignancies, chronic diseases, increasing number of transplants, complex surgical procedures, catheters, implants and use of wide spectrum antibiotics. The most important factors for candidemia are intravascular catheters; intensive cancer chemotherapy, broad spectrum antimicrobial therapy, invasive medical devices, organ transplantation, HIV & expanding aging population^{3,4}.

Methods: This study was carried out at Microbiology Department, B.J. Medical College, Tertiary Care Hospital, Ahmedabad. On the basis of the guidelines of the Centers for Disease Control [CDC] and Prevention and the Infectious Diseases Society of America [IDSA]^{5, 6, 7}, candidemia was defined as the isolation of a Candida spp. from at least 1 blood culture in the presence of signs and symptoms of

systemic fungal infection. All samples were collected under strict aseptic precautions. This study was conducted over a period of 6 months from April-2016 to September-2016. Total of 3686 blood samples were collected from different age group of patients admitted in Civil Hospital Ahmedabad. Inoculated Blood culture bottles received from hospital were incubated at 37°C. After being signaled positive in Bact/ALERT subculture was done. Isolated colonies were identified considering their macroscopic appearance by colony morphology, microscopic by gram stain, germ tube test, biochemical properties, chrome agar, sabouraud dextrose agar, cornmeal agar, and carbohydrate assimilation & fermentation tests. Antifungal susceptibility to fluconazole, itraconazole, amphotericin B, voriconazole, and miconazole were tested.

Method: Disk diffusion method recommended by CLSI guidelines. Media: Glucose (2%) & Methylene blue (50 mcg/ml) contained muller hinton agar incubated at 37°C for overnight. If confluent growth is not obtained, further incubated for another 24 hrs. Then zone of inhibition is measured.

Result: Out of 3686 Blood Samples, 2048(55.56%) were culture positive. 129(6.29%) of the isolates were Candida species.

Age distribution is shown in table 1.

Age group	Total number of patients
Infants	99(76.74%)
1 -12 years	6(4.65%)
12 -60 years	16(12.40%)
>60 years	7(5.42%)

Most common species identified in blood was *Candida parapsilosis*. As shown in table-2 non albicans species were identified in 86% of patients while the *C. albicans* was identified only in 14% of patients.

Species name	Number of patients
<i>C. krusei</i>	26(20.15%)
<i>C. tropicalis</i>	19(14.72%)
<i>C. albicans</i>	18(13.95%)
<i>C. parapsilosis</i>	66(51.16%)

Antifungal sensitivity results are summarized in table 3.

Antifungal drug	Percentage of resistance
Itraconazole	24(18.60%)
Fluconazole	37(28.68%)
Nystatin	17(13.17%)
Voriconazole	21(16.27%)
Ketoconazole	31(24.03%)

As seen in table 3 resistance to antifungal drugs including newer drugs like voriconazole is also high.

Our most of the isolates has resistance to more than one azole drug.

Most isolates were sensitive to Amphotericin B.

Discussion: Over the past 30 years, numerous investigators have reported that the frequency of severe infections caused by yeasts, especially *Candida* spp., has increased dramatically⁸. Emerging non-albicans *Candida* spp. showed increased virulence, increased mortality and resistance to common antifungal drugs⁹. Hence, species identification is very important as *C.kruzei* and *C.glabrata* are inherent resistant to fluconazole and voriconazole.

The present study emphasizes the importance of candidemia among hospitalized patients. Candidemia is not only associated with a significant mortality but also extends the duration of hospital stay and increases the cost of medical care.

Patients with candidemia usually present with acute septic syndrome that is indistinguishable from bacteremia, but they may also exhibit a more indolent course manifested by fever of unknown origin.

Table of comparative study: The distribution of species of *Candida* obtained from the bloodstream varies according to the geographic area and the population on which the studies are performed, probably due to variations in the endogenous microorganisms of the patients. Our study has 14% isolates of *Candida albicans*, while rest was non-albicans species. Banerjee B et al¹⁰ had candida albicans isolates in 27.5%. It also reported most common species being *C. glabrata* while in our study has most common isolate *C. parapsilosis*. Chander J et al¹¹ reported *C. albicans* prevalence of 29.4% with *C. tropicalis* being most common species in isolates. This might be due to regional variation.

Conclusion: Candidemia is emerging as a significant problem in hospitalized patients, especially in ICU setups. Non-albicans *Candida* species are the major cause of candidemia as found in our study. Multicentric studies involving many hospitals are required to know the true prevalence of candidemia and the status of antifungal drug resistance among *Candida* isolates in our country.

Acknowledgment: We sincerely acknowledge and appreciate Dr Hetal Shah and Dr Sumeeta Soni – senior microbiologists, Department of Microbiology, B.J.Medical College, Ahmedabad, for their kind support for this study.

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Conflict of interest: None

Funding: None

Cite this Article as: Mistry U, Vegad M, Mistry A, Bhoya R, Vagadia V. Prevalence of Candidemia in a Tertiary Care Hospital, Ahmedabad. Natl J Integr Res Med 2017; 8(2):143-145
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