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# Phenotypic Characterization And Anti-Fungal Susceptibility Of Candida Species Isolated From Various Clinical Samples Of Immunocompromised Patients In A Teritiary Care Hospitals.

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**ABSTRACT**
Candidiasis is a primary or secondary mycotic infection caused by members of the genus *Candida*.The clinical manifestations may be acute,sub acute or chronic.Involvment may be localized to the mouth, throat, skin, scalp, vagina, fingers, nails, bronchi, lungs or the gastrointestinal tract which become systemic in septicemia, endocarditis and meningitis. Candidiasis are the most common infection among immunocompromisedpatients despite many advances in antifungal therapy. Candidiasis remains significant cause for the patient morbidity and mortality. Species identification is done by KOH direct mount, gramstain, germ tube test , culturing on SDA, chlamydospore formation. Antifungal susceptibility done by disc diffusion method. Out of 200 various clinicalsamples, 51 isolates were *Candida spp*. The most common isolates were *Candida albicans* (70.59%),*Candida tropicalis* (21.57%), *Candida guillerimondi* (3.92%),*Candida parapsilosis* (1.96%),*Candidadubliniasis* (1.96%). Among antifungal susceptibility, Nystatin (86%) is more sensitive than amphotericin B (51%) and 100% strains are resistance to itraconazole.These results incriminated *Candida albicans* as the most common *Candida* species causing candidiasis in immunocompromised patients . thissuvilence study has established nystatin and amphotericin B as very effective anti fungal agents for the treatment of candidiasis.

**Keywords:**Candidiasis,candida spp, antifungal susceptibility, immunocompromised patients.

## 1. INTRODUCTION

Infections have always been a threat to mankind caused by bacteria, fungi, virus,protozoa and recently of unconventional infectious agents. Fungihas been recognized as causative agents of infections earlier to bacteria. Candida is a genus of yeasts. Many species of this genus are endosymbionts of animal hosts including humans. Candidaalbicans, which can cause infections(called candidiasis or thrush) in humans and other animals, especially in immunocompromised patients [1-2].The colonies of Candida spp. are cream colored to yellowish, grow rapidly and mature in 3 days. The texture of the colony may be pasty, smooth, glistening or dry, wrinkled and dull, depending on the species.The microscopic features of Candida spp.show species-related variations.All species produce blastoconidia singly or in small clusters and may be round or elongate. Most species produce pseudohyphae, which may be long, branched or curved. Candida is almost universal on the normal adult skin and C.albians is part of the normal flora of the mucous membrances of the respiratory, gastrointestional, and female genital tracts.The important members of this genus which are capable of producing infections are Candida albicans , candida tropicalis (intestines) , Candida parapsilosis, Candida krusei,

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Candida glabrata, Candida guilliermondii (skin) and Candida viswanathi [3].The infectious disease manifestations of Candida albicans are primarily of three types: mucocutaneous , cutaneous and systemic. Candida septicemia may also be seen in patients receiving long term antibiotics and corticosteroids.

## 2. MATERIALS AND METHODS

The study was carried out in the department of microbiology, Meenakshi Medical College and Research Institute , Enathnur, India. A total of 200 various clinical sample (sputum, throat swab, urine ,vaginal swab and pus) were collected from immunocompromised patients for six months. Species identification is done by KOH direct mount , microscopic appearance by gramstain, germ tube test , culturing on SDA and chlamydospore formation. Antifungal susceptibility is performed by disc diffusion method (Table 1 and 2).

## 3. RESULTS

Out of 200 various clinical samples, 51 isolates were *Candida spp*. The most common isolates were *Candidaalbicans* (70.59%),*Candida tropicalis* (21.57%), *Candida guillerimondi* (3.92%),*Candida parapsilosis* (1.96%),*Candida dubliniasis* (1.96%).

**Table 1. *Candida* isolates from immunocompromised patients**

| Candida species | No. of isolates | Percentage (%) |
|---|---|---|
| Candida albicans | 36 | 70.59% |
| Candida tropicalis | 11 | 21.57% |
| Candida guilliermondii | 2 | 3.92% |
| Candida parapsilosis | 1 | 1.96% |
| Candida dubliniensis | 1 | 1.96% |

In antifungal susceptibility, Nystatin (86%) is more sensitive than amphotericin B (51%) and 100% strains are resistance to itraconazole.

**Table 2.Antifungal susceptibility pattern of *Candida* strains**

| ANTIFUNGAL AGENT | SENSITIVE | INTER-MEDIATE | RESISTANT |
|---|---|---|---|
| Amphotericin-B (10µg) | 51% | 31% | 18% |
| Fluconazole(10µg) | 16% | 6% | 78% |
| Ketoconazole(10µg) | 0% | 8% | 92% |
| Itraconazole(10µg) | 0% | 0% | 100% |

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| | | | |
|---|---|---|---|
| Nystatin(10µg) | 86% | 14% | 0% |

## 4. DISCUSSION

Yeasts are common fungal agents affecting humans. They cause diseases with severity, ranging from benign to potential life threatening infections, with the most common yeasts being *Candida* . *Candida albicans* remains the predominant species causing over half of all the yeast infection cases, in the world. Increase in the prevalence of yeast infections caused by non-albican*Candida* such as *Candida glabrata* ,*Candida krusei*, *Candida tropicalis* and *Candida parapsilosis* have been reported in many parts of the world.[4] Results obtained in this study, establish several points pertinent to the prevalence of candidiasis in immunocompromised patients. Five candida species (*Candida albicans, Candida parapsilosis, Candida guilliermondii*and *Candida dubliniensis*) were isolated from various clinical samples of immunocompromised patients.

The prevalence rate of *Candidaalbicans* in india were found to be 37.5% and non-candida albicans 62.6% (3). In other study *Candida albicans* 49.3% and non-candida albicans 46.3% [5].

In the present work, germ tube production seen in 36/51 strains, identified as *Candida albicans*whereas the remaining Strains are failed to produce germ tubes, being identified as non-albicans [6]. This ratio is markedly lower than that was reported earlier. The germ tube production test, has the advantage to be simple and efficient in the economical and fast identification of *Candida albicans* . Some authors evaluated sensitivity and specificity of the germ tube test, finding results between 93 and 98.8% and between 73.3 and 100% respectively [7]. In corn meal agar *Candida albicans* and *Candida dubliniensis* were able to produce chlamydospores.

In conclusion, for the past two decades we haveseen a significant rise in the infections caused by *Candida* species in and around the world. These are report of resistanceby candida species to antifungal therapy.Diabetes mellitus patients are immunocompromised and are more prone to such common infection. *Candida albicans* as the most candida species causing candidiasis.This surveillance study has established nystatin and amphotericin-B as very effective antifungal agents for the treatment of candidiasis.

## REFERENCES

1.MaruthupandianPriyadarshini, ChettipalayamSamiappan sumathi, Velramarbalasubramanian, Janarthanamhemapriya, Rajesh Kannan. (2011). virulence factors and anti fungal sensitivity pattern of *Candida Sp*. Isolates from HIV and TB patients nachimuthuramesh .

2.Chian-Yong Low and Coleman Rotstein. (2011).·Emerging fungal infections in immunocompromised patients chian-yong low1,2 and coleman rotstein1, F 1000 Med Reports, 3(14): 280-287

3.Bedini A, Venturelli C, Mussini C, Guaraldi G, Codeluppi M, Borghi V, Rumpianesi F, Barchiesi F and Esposito R.(2006). Epidemiology of candidaemia and antifungal susceptibility patterns in an Italian tertiary care hospital.ClinMicrobiol Infect, 12(1):75-80.
4.Enwuru CA, ogunledun A, Enwuru NV, Ogbonna F, Aniedobe M and Adeiga A. (2008). Fluconazole resistant opportunistic oropharyngeal candida and non candida yeast like isolates from HIV infected patients attending ARV Clinics in lagos , Nigeria, Afr Health Sci, 8:142-148.
5.Fego PK and Narkwa P. (2012). Prevalence and antifungal susceptibility patterns of yeast at the komfoanokye teaching hospital(KATH), Kumasi, Ghana Brit Microb Rese Jor, 2(1):10-22.
6.Silva S, Negri M, Henriques M, Oliveira R, Williams D, AzeredoJ. (2010). Silicone colonization by non candidaalbicans candida species in the presence of urine. J Med Microbiol, 59: 747-54.
7.Mohammed Salhussaini, Noha F El-Tahatwi, Ahmad M Moharram. (2013). Phenotypic and molecular characterization of candida species in urine samples from renal failure patients Sci J Cin Med 2(1);14-25.
8.Differential expression of Helios, Neuropilin-1 and FoxP3 in head and neck squamous cell carcinoma (HNSCC) patients A.A.Mohamed Adil, Anil Kumar Bommanabonia, AnandrajVaithy, Sateesh Kumar 3biotech 9 (178)
9. Protagonist of Immuno-Profiling, Immuno-Scoring, and Immunotherapy Towards Colitis-Associated Cancer: Systematic Review, Mohamed Adil a.a, AK Pandurangan, M Waseem, N Ahmed Diagnostic and Treatment Methods for Ulcerative Colitis and Colitis 2020
10. Emerging Role of Mitophagy in Inflammatory Diseases: Cellular and Molecular Episodes, Mohamed Adil AA, S Ameenudeen, A Kumar, S Hemalatha, N Ahmed, N Ali 2020 Curr Pharm Des. 2020;26(4):485-491. doi: 10.2174/1381612826666200107144810
11. Increased Expression of TGF-β and IFN-γ in Peripheral Blood Mononuclear Cells (PBMCs) Cultured in Conditioned Medium (CM) of K562 Cell Culture AAM Adil, L Vallinayagam, K Chitra, S Jamal, AK Pandurangan, N Ahmed Journal of Environmental Pathology, Toxicology and Oncology 38 (2)
12. Cancer immunotherapy: Targeting immunosuppressive tumor microenvironment NA A.A Mohamed Adil Oncobiology and Targets 2014