



Study of Changing Trend in the Clinical Distribution of Candida Species in Various Clinical Samples at Tertiary Care Hospital, Ahmedabad, Gujarat

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ABSTRACT

Introduction: The incidence of fungal infections has increased significantly, contributing to morbidity and mortality. *Candida albicans* remains the most common species causing human infections but recent epidemiological data reveal shift from *C. albicans* to non *albicans* *Candida* species. The aim of our study is to detect the clinical distribution of *Candida* species in a tertiary hospital.

Materials and Methods: Study of identification of *Candida* species was carried out at tertiary care hospital of Ahmedabad from 1st January 2016 to 30th June 2016. Total 102 *Candida* isolates were identified from various clinical samples. Identification of *Candida* species was done by standard techniques which include growth on Sabouraud dextrose agar and Chrom agar, Sabouraud dextrose broth, Germ tube test, slide culture on Cornmeal agar, urease test and Carbohydrate utilization pattern by sugar assimilation test.

Results: Out of 102 *Candida* isolates collected 58% were from males and 42% from females. The distribution of the clinical samples was urine 51.96%, exudates 14.70%, respiratory 13.72% and blood 19.60%. In this study most frequently isolated *Candida* species was *C. tropicalis* 43 (42.15%) followed by *C. albicans* 37 (36.27%), *C. guilliermondii* 14 (13.72%), and *C. parapsilosis* 4 (3.92%). *C. krusei* 4 (3.92%). *C. tropicalis* was mainly isolated from urine samples.

Conclusions: The present study shows increased incidence of non *albicans* *Candida* as compared to *Candida albicans*.

Keywords: *Candida* infection, *Candida* species, chrom agar

INTRODUCTION

Fungal infections are a major cause of morbidity and mortality in immune compromised individuals and *Candida* are among the most common pathogens in these Patients¹. These yeasts are commensal in healthy humans and may cause systemic infection in immune compromised situations due to their great adaptability to different host niches. The rise of systemic *Candida* infections are related with several factors like immunocompromised status-HIV/excessive use of

broad spectrum antibiotics and metabolic disorders.² Candidiasis is an infectious disease with high morbidity and mortality, of which prevalence has dramatically increased in the past 20 years^{3,4}. In the past, the most causative pathogen was *Candida albicans*, but recently various types of *Candida* spp. such as *Candida parapsilosis*, *Candida glabrata*, and *Candida krusei* have emerged as important opportunistically infectious fungi^{5,6}.

Recent epidemiological data reveal shift from *C. albicans* to non *C. albicans* species. Besides epi-

miological pattern change ,there is an increase of Candida species resistant to conventional therapy.⁷ The potential clinical importance of species-level identification has been recognized as Candida species differ in the expression of putative virulence factors and antifungal susceptibility^{8,9} .Rapid identification of yeast species also guides early appropriate antifungal therapy.

This study was carried out to detect clinical distribution of Candida Species in various clinical samples.

MATERIALS AND METHODS

A total of 102 candida isolates from different clinical samples including blood(20), urine(53), respiratory samples (14), exudates(15) etc. of patients who attended outpatient and inpatient departments of a tertiary care hospital V.S.G.H. and NHL Medical college during the period from 1st January to 30th June, 2016were studied. Direct Gram staining was carried out with the sample. They were inoculated on Sabouraud’s Dextrose Media and incubated at 25°C and 37°C. Identification of Candida species was done by standard techniques. Laboratory investigations which were carried out include Germ tube test (figure-1), Carbohydrate utilization pattern by sugar assimilation test on YNB media, Type of growth in Sabouraud's broth (figure-2), Morphology on corn-meal agar(Dalmau method), Morphology on Chromogenic agar.



Fig 1: Germ tube test

RESULTS

Out of 102 Candida isolates studied 58% were from males and 42% were from females. The distribution of the clinical samples were urine 53 (51.96%), exudates 15 (14.70%), respiratory 14 (13.72%) and blood 20 (19.60%). Among all candida isolates C. albicans 37 (36.27%) was isolated. The distribution of non C. albicans were C. tropicalis 43 (42.15%), C. krusei 4 (3.92%), C. guilliermondii 14 (13.72%), C. parapsilosis 4 (3.92%).

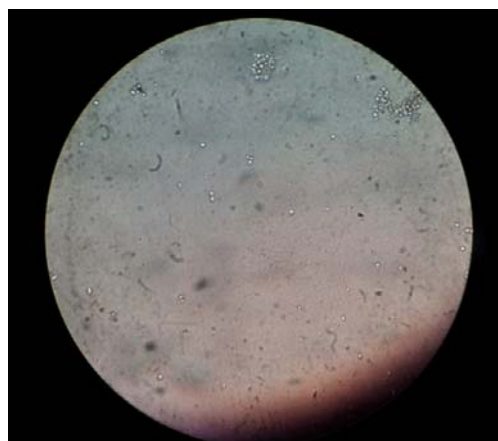


Fig 2a&b: Growth in Sabouraud's broth

Table-1 Species distribution among various clinical samples (n=102)

Sample	C.albicans (36%)	C.tropicalis (42%)	C.guilliermondii (14%)	C.parapsilosis (4%)	C.krusei (4%)
Urine(n=53)	15 (14.70%)	32(31.37%)	2(1.96%)	1(0.98%)	3(2.94%)
Blood(n=20)	2(1.96%)	6(5.88%)	10(9.80%)	2(1.96%)	0
Respiratory (n=14)	11(10.78%)	1(0.98%)	0	1(0.98%)	1(0.98%)
Exudates(n=15)	9(9.80%)	4(3.92%)	2(1.96%)	0	0

DISCUSSION

Candida invade various biomaterials and host surface when the host defenses are jeopardized .Over the past decade, there has been a significant increase in the number of reports of systemic and

mucosal yeast infections with Candida species other than C. albicans.¹⁰ This study aims at characterizing Candida isolates obtained in our lab and to determine the percentage of isolation of C. albicans and non albicans candida(NAC) species from various clinical specimens.

The higher rate of isolation of NAC species 63.72% over *C. albicans* 36.27% in the present study is consistent with various studies by Chakraborti et al.¹¹, Mokadda et al.¹² and Saldhana et al.¹³ who found NAC 75%, *C. albicans* 25%, NAC 69.5%, *C. albicans* 30.5% and NAC 53%, *C. albicans* 47% respectively. Similarly Jaya et al.¹⁴ found non-*albicans* *Candida* was the predominant pathogens (47.8%) followed by *C. albicans* (32.86%). These findings suggested that non-*albicans* *Candida* species are emerging as important as well as predominant pathogen.

Kidney is often the earliest target organ involved in hematogenous *Candida* infections. Candidal colonization of the urinary tract is common in patients with diabetes, patients receiving broad-spectrum antibiotics or immunosuppressants, or those with long term urinary catheters. Our study correlated with the previous studies^{15,16} in that among the clinical samples more number of *Candida* isolates were found in urine sample (51.93%).

The most frequent NAC isolate in other studies^{17,18} was *C. tropicalis*: the same as in our study. The variation in the predominance of *Candida* species observed in different studies may be due to change in the environmental conditions, diversity of the study population or the institutional based protocol for the usage of antifungal agents.

CONCLUSION

The present study shows increased number of non-*albicans* *Candida* as compared to *Candida albicans* in various clinical samples in our hospital. Isolation and prompt identification of the infecting organism to the species level is essential to optimize the early antifungal therapy.

Limitations of the study:

Due to cost constraints the antifungal susceptibility testing was not done, which is very important for starting the specific antifungal therapy.

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