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Original Research Article

FUNGAL PROFILE & ANTIFUNGAL SUSCEPTIBILITY PATTERN OF DIFFERENT CANDIDA SPECIES IN TERTIARY CARE HOSPITAL OF CENTRAL INDIA.

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Abstract:

Background & Method: The aim of this study is to study the antifungal susceptibility testing pattern of different Candida species isolated. Among 5000 total samples a total of 40 *Candida* species were isolated from different clinical specimens. Different samples taken were urine, blood, sputum, stool, body fluid, vaginal swabs, pus etc.

Smear showing pus cells, budding yeast cells and pseudohyphae denoted infection by Candida species. But in case of C. glabrata, presence of pus cells and yeast cells were indicative of infection.

Result: 60% isolates were C. albicans followed by C. krusei (17.5%). By disk diffusion method, 16 (41.46%) isolates were resistant to Fluconazole, 14 (36.58%) isolates were resistant to clotrimozole. All the isolates were sensitive to Amphotericin –B. P-Value = 0.011, which is significant statistically.

Conclusion: C. albicans remains the main species but increasing incidence of non albicans Candida spp. has also been reported, and their antifungal drug susceptibility among patients visiting our tertiary care hospital. An increase in the predisposing conditions in recent years has resulted in an increasing incidence of Candida infections. Therefore species level identification of Candida isolates along with their antifungal susceptibility patterns can greatly influence the treatment options for the Clinician and may have an impact on the patient care.

Keywords: antifungal, susceptibility, & Candida.

Study Designed: Prospective Observational Study.

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1. INTRODUCTION

Today Candida species are considered to be the third to fourth most common agent causing nosocomial blood stream infections, and also the most common pathogens causing opportunistic fungus isolated from clinical samples[1]. Candida species is the fifth most common nosocomial urinary pathogen in India[2] . Candida is listed by Center for disease control as a cause of sexually transmitted diseases. Cross-contamination by hospital personnel may also account for increase in yeast infections in certain environments[3].

The most common cause of invasive fungal disease, is infection with Candida. Neonates and infants have been populations with some highest risk of candidemia[4]. Importance of Candida species in nursery and intensive care units (ICUs) is increasingly being recognized. Candida species accounts for 9-13% of all blood isolates in neonatal intensive care units (NICU)[5]. The incidence of Candidemia of 6.9 per 1,000 intensive care unit (ICU) patients was reported in recent study. The reasons for this is manifold, namely the widespread use of broad spectrum antibiotics, increasing incidence of HIV infection and the availability and use of advanced therapeutic modalities for advanced life support system.

Candida species have isolated from animals, hospital environment, inaminate objects and food. Most of the human infections are endogenous in origin[6]. They are normal commensals of humans and are commonly found on skin, gastrointestinal tract, in expectorated sputum and in female genital tract[7].

The normal residence of C. albicans in vagina, bowel, mouth and skin is significant in at least two respects. First, cultural isolation of this yeast from material passing through mouth or vagina does not constitute proof of infection. This must be kept in mind especially in case of sputum, because pulmonary infection due to C. albicans is rare. The second significance of normal carriage sites of C. albicans is that they represent foci for transmission [8].

2. MATERIAL & METHOD

This study was carried out in the microbiology department of a teaching hospital of central India. The study consisted of total 5000 samples during the study period of 1 year at tertiary care hospital. Among 5000 total samples a total of 40 *Candida* species were isolated from different clinical specimens. Different samples taken were urine, blood, sputum, stool, body fluid, vaginal swabs, pus etc.

Details of the patients were recorded. A detail history was taken with demographic details (name, age, sex, IPD no, presenting complaints, sign and symptoms, presence of predisposing factors and treatment). Patient's hospital records were used to know the use of any antifungal agents and past medical conditions.

INCLUSION CRITERIA:-

- All types of samples were included in this study.
- Strains criteria- only Candida species was included.
- Both male and female were included in this study.

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EXCLUSION CRITERIA:-

- Second repeat isolate from same patient.
- Strain criteria- fungus other than Candida and all bacteria.

Smear showing pus cells, budding yeast cells and pseudohyphae denoted infection by Candida species. But in case of C. glabrata , presence of pus cells and yeast cells were indicative of infection.

3. RESULTS

Table 1: Species wise distribution of the isolates

***Candida* species**	**No. of isolates**	**Percentage (%)**	**P-value**
C. albicans	24	60	0.0001
C. glabrata	06	15	
C. krusei	07	17.5	
C.parapsilosis	02	05	
C. tropicalis	01	2.5	
Total	40		

60% isolates were *C. albicans* followed by *C. krusei* (17.5%).

Unpaired t test, P value- 0.0001 which is less than 0.05 hence it is extremely significant statistically.

Table 2: Antifungal susceptibility pattern of isolates

	Susceptible		**SDD/I**		**Resistant**	
	n	**%**	**n**	**%**	**n**	**%**
Fluconazole	19	47.56	04	10.97	16	41.46
Amphotericin –B	40	100	00	-	00	-
Clotrimozole	23	58.53	02	4.87	14	36.58
Nystatin	37	92.68	03	7.31	00	-

By disk diffusion method, 16 (41.46%) isolates were resistant to Fluconazole, 14 (36.58%) isolates were resistant to clotrimozole. All the isolates were sensitive to Amphotericin –B. P-Value = 0.011, which is significant statistically.

Table 3: Distribution of the susceptibility pattern among the *Candida* isolates

Species	**Total n**	**Fluconazole**			**Amphotericin-B**			**Clotrimozole**			**Nystatin**		
		S	**SDD**	**R**	**S**	**SDD**	**R**	**S**	**SDD**	**R**	**S**	**SDD**	**R**
C.*albicans*	24	17	02	04	18	00	00	19	01	4	22	02	00
C.glabrata	06	01	02	04	06	00	00	01	01	04	05	01	00
C.krusei	08	00	00	08	08	00	00	03	00	05	08	00	00

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C.tropicalis	01	01	00	01	07	00	00	01	00	01	02	00	00
C.parapsilosis	01	00	01	00	01	00	00	00	00	01	01	00	00
Total	40	19	05	17	40	00	00	24	02	15	38	03	00

17 isolates were resistant to fluconazole and 15 isoltes were resistant to clotrimozole, and no resistance pattern seen in amphotericin B and nystatin.

Pearson Chi- square test = 0.888 , DF- 1, Hence P value- 0.360 ,which is not <0,05 hence it is not statistically significant.

4. DISCUSSION

In present study, the highest number of isolates were from Blood sample (46.34%) followed by urine sample (24.37%). These finding are consistent with other studies. In a study by Rajkumari N[9] , it was observed that maximum isolates were from blood (70%), followed by urine (21%). A study by Jaggi T et al[10] has reported that 33.6% of total samples were of blood. Another study conducted by Pahwa N et al[11] also reported the highest number of isolates were from blood (24.5%) followed by urine sample(19%).

Patients on urinary catheter (19.59%) was fifth most common predisposing factor in the present study. Patients were on urinary catheter, this is of concern as candiduria has become a potential source of morbidity and mortality, if left untreated. Candiduria has been found to be a risk factor for candidemia. A study by Nucci M[12] suggested that as many as 10% of all candiduria cases may be associated with candidemia.

The other risk factor present study were, pregnancy (23.17%). Study by Kashid et al[13] also showed pregnancy (14.26%) as important risk factor. The increased prevalence of genital candidiasis in pregnancy is due to the increase in the glycogen content of the vagina and thus increasing the colonization of *Candida*[13]. In present study pre- term and low birth weight baby(14.63%), the study results correlate well with the studies by Kashid et al[13] (14.96%).

The in vitro susceptibility testing of antifungal agents is becoming increasingly important because of the introduction of new antifungal agents and the recovery of clinical isolates that exhibit inherent or developed resistance to Amphotericin B and azole group of drugs during chemotherapy. Antifungal susceptibility testing was done for 40 *Candida* isolates by disc diffusion method.

5. CONCLUSION

C. albicans remains the main species but increasing incidence of non albicans Candida spp. has also been reported, and their antifungal drug susceptibility among patients visiting our tertiary care hospital. An increase in the predisposing conditions in recent years has resulted in an increasing incidence of Candida infections. Therefore species level identification of Candida isolates along with their antifungal susceptibility patterns can greatly influence the treatment options for the Clinician and may have an impact on the patient care.

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