Isolation and identification of Candida albicans from clinical specimens received at tertiary care centre

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Abstract---Background &Method: The aim of this study is to study Isolation and identification of Candida albicans and non candida albicans species in all clinical specimens received at Tertiary Care Centre.A detail history was taken with demographic details. Patient's hospital records were used to know the use of any antifungal agents and past medical conditions. Result: 23.3% of the patients of age group < 1 year, followed by (16.6%) 41-50 years of age group and 6.6% of patients are 61-70 years of age group. 56.6% were male patients and 43.3% were female.53.4 % were Candida albicans and 46.6% were non-albicans Candida spp. By using unpaired t test, P value- 0.041, which is less than 0.05, hence it is statistically significant. 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. Among 3000 of total samples processed during the study period, 30 isolates were positive for Candida infection. So prevalence rate was 0.81%. There was predominance of male patients (54.87%) with male to female ratio of 1.2:1.Majority of patients belonged to age group of < 1 year (23.17 %).

Keywords---isolation, Candida albicans, non Candida albicans.

Introduction

The history of candidiasis dates back to fourth century BC when Hippocrates described thrush/oral apathe in the mouth of debilitated babies[1]. The term

"thrush" which is considered as 'WHITE PLAGUE' of immunocompromised[2], is probably derived from the ancient Scandinavian word 'Torsk', the Swedish equivalent of this word. The French word for the condition is 'le Muguet' which means "lily of the valley".[3] There was confusion regarding relationship of fungus to the disease and the host and whether the infection was due exclusively to abnormalities of the host or whether it was caused by contagion or both. A clinician/ scientist, Rosen Von Rosenstein in 1771, indicated that the disease was of significant consequence and defined an invasive form of thrush, even though no etiology was described. Underwood in 1784, recognized thrush as a pediatric problem and described oral as well as gastrointestinal thrush in textbooks. Thereafter Veron in 1835, first described a case of esophageal candidiasis and postulated that newborn, acquire the disease during passage through vagina[4].

The rise in incidence of resistance to antifungal drugs is even more alarming. Although Amphotericin B and Flucytosine continue to be effective, the loss of susceptibility to azoles, especially Fluconazole, is a matter of great concern. This is because the non albicans Candida exhibiting varying degree of resistance, both innate and acquired to the current spectrum of Azole. It has become imperative, therefore to promptly report to the clinician, not only the infecting species of Candida but also the drug susceptibility of same. Candida spp identification is therefore important for successful management. Speciation helps to understand the epidemiology of Candida spp. particularly mode and source of transmission[5]. This facilitates the development of effective measures to prevent and control transmission of resistant pathogens.

Material & Method

This study was carried out at the Department of Microbiology at Tertiary Care Centre of Central India from January 2022 to June 2022. The study consisted of total 3000 samples during the study period at tertiary care hospital. Among 3000 total samples a total of 30 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.

Exclusion Criteria

- Second repeat isolate from same patient.

Results

Table 1: Age and gender wise distribution of cases

Age group (years)	No. of cases	Male	Female
< 1	07	04	03
1- 10	02	01	01
11- 20	03	02	01
21- 30	04	02	02
31-40	03	03	-
41-50	05	02	03
51-60	03	01	02
61-70	02	01	01
>71	01	01	-
Total	30	17	13

23.3% of the patients of age group < 1 year, followed by (16.6%) 41-50 years of age group and 6.6% of patients are 61-70 years of age group.56.6% were male patients and 43.3% were female.

Table 2: Sample wise distribution of culture positive isolates

S.N.	Sample	Culture positive samples	%
1.	Blood	13	43.3
2.	Urine	06	20
3.	HVS	02	6.6
4.	Respiratory samples (Sputum,BAL, Endotracheal tube)	04	13.3
5.	Pus	02	6.6
6.	Stool	01	3.3
7.	Body fluids (Ascitic fluid, Pleural fluid)	02	6.6
	Total	30	

A total of 3000 samples of were received in the Microbiology Laboratory, of which 30 samples yielded growth of *Candida* species.

Table 3: Distribution of C. albicans and non-albicans Candida spp.

Species	No. of isolates (%)	P- value
Candida albicans	16 (53.4%)	
Non – albicans Candida spp.	14 (46.6%)	0.041
Total	30	

53.4 % were Candida albicans and 46.6% were non-albicans Candida spp. By using unpaired t test, P value- 0.041, which is less than 0.05, hence it is statistically significant.

Discussion

The age range in the present study was the youngest study subject was a 2-day old while the oldest was a 97 years old man, which was in favour of the study by Kashid et al[6], the age range was from 1-day to 90 years. Candidemia is well-known for affecting the extremes of age, possibly due to the immaturity of the immune system in children, and the waning of the immune response in the elderly. In our study also majority of the patients are from age group <1 year (23.17%), followed by 41-50 years (18.29%) of age group, reason for this might be the overrepresentation of middle-aged people among patients admitted to our wards or ICU[7].

Males (54.85%) were predominant in our study, it could be due to higher number of sample which were collected from male patients. Singh K et al[8] observed that male sex is a risk factor for developing candidemia. The incidence of candidiasis was higher in male (76%) than in female (24%). In a similar study by Rajkumari N et al[9], the incidence of candidiasis was found to be higher in male (71%). In contrast, Latiff et al[7]showed female preponderance constituting 74.7% of the study group.

Out of 82 Candida spp. isolates obtained in the present study, species identification revealed that 48 (58.53%) were Candida albicans which was the most frequently isolated species and the remaining 34(41.46%) were non-albicans Candida spp., this distribution was significant statistically (P value=0.0001). This was in concordance with the study done by Leroy et al[10]reported similar findings with 53% of C. albicansand 47 % of non-albicans species in their study.

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. Among 3000 of total samples processed during the study period, 30 isolates were positive for Candida infection. So prevalence rate was 0.81%. There was predominance of male patients (54.87%) with male to female ratio of 1.2:1.Majority of patients belonged to age group of < 1 year (23.17 %).

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