ORIGINAL RESEARCH PAPER

Clinical Microbiology

A STUDY ON THE PHENOTYPIC IDENTIFICATION OF CANDIDA ALBICANS OR NON ALBICANS FROM VARIOUS CLINICAL SAMPLES

KEY WORDS: Candida albicans, non albicans, CHROM agar, Candidiasis

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ABSTRACT

Introduction Candida is ubiquitous fungus which is a common commensal flora and cause opportunistic infection mostly in immunocompromised hosts. The most common form of candida infection is vulvovaginitis, this is mostly due to the overgrowth of vaginal candida present in the lower genital tract. The present study was conducted to identify the distribution and frequency of isolation of candida species from various clinical samples. **Materials and methods:** This study was conducted in Doctor Moopens medical college during July 2021 to February 2022 in the department of Microbiology. A total of 41 candida albicans and non albicans isolates were identified from various clinical samples (n=1744) like urine, vaginal swab, pus, blood, skin scrapings and sputum. Growth was identified from SDA and speciation was done using CHROM agar. **Result:** A total of 41 yeasts were isolated from 1744 different clinical samples. Most of the isolated candida were Candida albicans (73%) non albicans was less (27%) Non albicans candida species included C.tropicalis (n=9), C glabreta (n= 1) and C.krusei (n=1) **Conclusion:** The pathogenic potential of candida is increasing and it is very much essential to routinely identify candida at its species level for providing the best treatment. The present study identified that vulvovaginal candidiasis is the most common infection caused by candida. . Elaborated studies on detailed phenotypic and genotypic studies are required for more understanding.

INTRODUCTION:

Candida is ubiquitous fungus which is a common commensal flora and cause opportunistic infection mostly in immunocompromised hosts[1]. This is a Gram positive, oval shaped, budding yeast like fungus which forms pseudo hyphae. There are around 200 different species of candida among which *candida albicans* is the most frequently reported species causing human infections[2, 3]. Other species are *C.glabrata, C.parapsilosis, C. tropicalis. C.krusei* etc. Nosocomial candidiasis is the most severe form of candidiasis and the source of infection can be both endogenous and exogenous[4]. The most common form of candida infection is vulvovaginitis, this is mostly due to the overgrowth of vaginal candida present in the lower genital tract[5,6]. Laboratory diagnosis of candida infection can be done using gram staining and culturing in SDA. Speciation can be done using germ tube test and growing in CHROM agar[7]. For further identification chlamydospore formation test, sugar assimilation and fermentation test can be done[8]. But these tests are labor intensive. Molecular methods are more expensive so are not usually used in routine diagnosis. The present study was conducted to identify the distribution and frequency of isolation of candida species from various clinical samples.

MATERIALS AND METHODS:

This study was conducted in Doctor Moopens medical college during July 2021 to February 2022 in the department of Microbiology. A total of 41 candida albicans and non albicans isolates were identified from various clinical samples (n=1744) like urine, vaginal swab, pus, blood, skin scrapings and sputum (Table 1).

Inclusion criteria:

The study included all the freshly isolated candida species from various clinical samples.

Exclusion criteria:

samples from patients on antifungal treatment.

Table:1

Type of sample	Number of samples
Urine	488
Sputum	371
Exudate	403
Swab	225
Blood	180
CT	77
Total	1744

Processing:

The specimens collected were processed in the microbiology lab using standard mycological methods. The different samples included were urine, sputum, exudates, swabs, blood and catheter tips. The specimens were properly labelled and transported to the microbiology lab for culture and sensitivity.

Microscopy of the specimen was done for identifying Gram positive budding yeast cells. The specimens were inoculated to Blood agar and chocolate agar. Direct smear positive samples were inoculated into sabourauds dextrose agar slants and were incubated at 37^{0}C for 24 hrs. The colony formed on the culture plates were further observed for colony characteristics, Gram's reaction, and germ tube test and then inoculated to CHROM agar for species identification (Table 2)

Table: 2 Identification of various *Candia* spp.on CHROM agar

	Species	Colour on CHROM agar
	Candida albicans	Light green
	Candida tropicalis	Blue with pink halo
	Candida krusei	Pink
	Candida glabrata	Pink to purple
	Candida parapsilosis	Cream to pale pink

RESULT:

A total of 41 yeasts were isolated from 1744 different clinical samples. Most of the isolated candida were Candida albicans (73%) non albicans was less (27%) Non albicans candida species included C.tropicalis (n=9), C glabreta (n= 1) and C.krusei (n=1)

Most of the candida were isolated from Vaginal swabs (n= 14), sputum (n=9), urine (n=7), pus (n=7), Catheter tip (n=3) and

ear swab (n=1). Most of the candida isolates were from female patients and the male female ratio was 1:2 and most of the strains were isolated from patients with an age group of 20 to 31 yrs and 60 – 71 yrs . .

DISCUSSION

The incidence of fungal infection by candida spp are increasing significantly. This is ranging from superficial infection to sepsis which may terminate fatally. Rapid identification of candida in species level is important in choosing appropriate medication and management. In this study we tried to identify the frequency of candida isolation from all types of clinical samples collected from different infectious conditions.

In the present study Candida albicans was the predominant fungal isolate (73%), A study conducted by Vigesh *et al.* [8] and Manjunath *et al.* [9] Also have same finding when they

We have noted a significant increase in the number of candida non albicans. This will be due to the improved identification system and this was supported in a study conducted by Ghazi *et al*.[10] The major Non albicans identified in this study was *C.tropicalis*, but this was contradictory with many other studies.[11,12]

The present study identified that vulvovaginal candidiasis is the most common infection caused by candida. This was supported by many studies and it is also pointing that most of the yeast infection by candida spp are in female when compared to male. There are many studies which is supporting this statement.[11,12].

We also found that CHROM agar is an effective method to speciate candida from clinical samples, this was supported by many studies.

There were data pertaining to other details of the patients such as the clinical history, details of underline diseases, immunosuppression etc. but the study failed to collect everything consistently.

CONCLUSION

The pathogenic potential of candida is increasing and it is very much essential to routinely identify candida at its species level for providing the best treatment. The detection level of non albicans strain is also increasing each year. The present study identified that vulvovaginal candidiasis is the most common infection caused by candida and most of the strains were isolated from patients with an age group of 20 to 31 yrs and 60 – 71 yrs . Elaborated studies on detailed phenotypic and genotypic studies are required for more understanding.

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