ORIGINAL RESEARCH

Study to find out the proportion of *Candida* species from various clinical specimens in tertiary care centre a cross sectional study

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Abstract
Background: Yeast is the most common cause of fungal infection. Historically, *C. Albicans*has been known to us since 400 BC, when the renowned Greek physician Hippocrates identified a microbial infection and named it "thrush," which is caused by this pathogen. The present study was carried out in the Department of Microbiology at the Mahatma Gandhi Memorial Medical College in Indore for a period of one year. August 2016 to August 2017 Sample size: All the clinical samples (15569) that are received in the Department of Microbiology laboratory. All the clinically suspected patients during the study period.
Result:*Candida* non-*Albicans* was the major species, accounting for 98 of the total isolates. *Candida Albicans*constituted 37. Other non-*Albicans* were *C. Tropicalis* (46), followed by *C. Glabrata* (22), *C. Krusei* (21), *C. Parapsilosis* (8), and *C. lusitaniae*.
Conclusion: The foundation for early fungal aetiology detection is provided by this work. Earlier A correct diagnosis and knowledge of the drug and host characteristics involved are crucial for improving these patients' outcomes.
Keywords: Blood culture, antibiotic resistance, BHI

Introduction

Yeast is the most common cause of fungal infection. Historically, *C. albicans* has been known to us since 400 BC, when the renowned Greek physician Hippocrates identified a microbial infection and named it "thrush," which is caused by this pathogen [1].*Candida* species are known to be the primary cause of hospital-acquired infections, or 8-10% of all nosocomialinfections.Currently,it is thought that *Candida* species constitute the fourth most common cause of systemic infections acquired in hospitals [2]. Fungal infections are becoming more common, which has raised death and morbidity rates. The use of strong chemotherapy drugs that change the host's immune response, the emergence of HIV/AIDS, intravenous drug misuse, and the intensive care unit's ability to extend the survival of critically ill patients are some of the reasons for the rising incidence [3].

Diabetes, cancer, extended antibiotic treatment, artificial heart valves, intravenous catheters, etc. are risk factors for contracting candidiasis.*Candida albicans*, as well as other *Candida* species on occasion, is the primary cause of candidiasis, an infection of the skin, mucous membranes, and internal organs.

The most frequent cause of candidiasis is *Candida albicans*, which affects practically every system in the body, from the skin to the central nervous system.In healthy people, as commensal flora of *Candida* can also be found in the vagina, gastrointestinal tract, and mucosal oral cavity.

This commensal can function as an endogenous opportunistic pathogen in response to modifications in the host and environmental circumstances [4].

Materialsand Methods

This study was carried out in theDepartment of Microbiology at the Mahatma Gandhi Memorial Medical College in Indore for a period of one year. August 2016 to August 2017.

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Sample size: All the clinical samples (15569) that are received in the Department of Microbiology laboratory. (All the clinically suspected patients during the study period).

(468)specimens for laboratory investigation were collected from the clinically suspected cases of candidiasis under strict aseptic precaution appropriate clinical materials. The various clinical specimens collected were throat swabs, auralswabs, vaginal swabs,corneal scrap,sputum, blood, pus,endotracheal secretion, intravenous jugular tip, oral thrush,urineetc. The specimen was subjected to preliminary tests like wet mount, Gram's stain, LPCB, culture on SDA,&Hichrom agar, germ tube test, sugar assimilation test, and Dalmau technique for *Candida* species.

Result

Table 1: Gram staining% of *Candida* species in allclinical specimens

Name ofClinical specimen	Total noof clinical Sample screened	Isolates candida fromclinical sample	Percentage (%)
Blood	3474	26	0.93
Urine	3126	23	0.71
Pus	2713	19	0.51
sputum	1287	15	0.19
Vaginal Swab	1254	15	0.18
Aural Swab	1646	13	0.21
Entotracheal Secretion	555	9	0.4
Oral thrush	45	5	9
Throat swab	1350	6	0.81
Juglar tip	54	1	0.54
Corneal scrappings	55	3	0.54
Total	15559	135	-

$\chi 2 = 77.43$, $p<0.0001$, Significant

Table 2: Different species of *Candida* isolated

Different Species	Total isolates	Percentage (%)
C. Tropicalis	46	34.07
C. Albicans	37	27.40
C. Glabrata	22	16.29
C. Krusei	21	15.55
C. Parapsilosis	8	5.92
C. lusitaniae	1	0.74

Candida non *albicans* was the major species accounting for (98) of the total isolates.*Candida albicans*constituted (37). Other non a*lbicans* were *C. Tropicalis* (46) followed by *C. Glabrata* (22), *C. Krusei* (21), *C. Parapsilosis* (8) and *C. lusitaniae* (1).
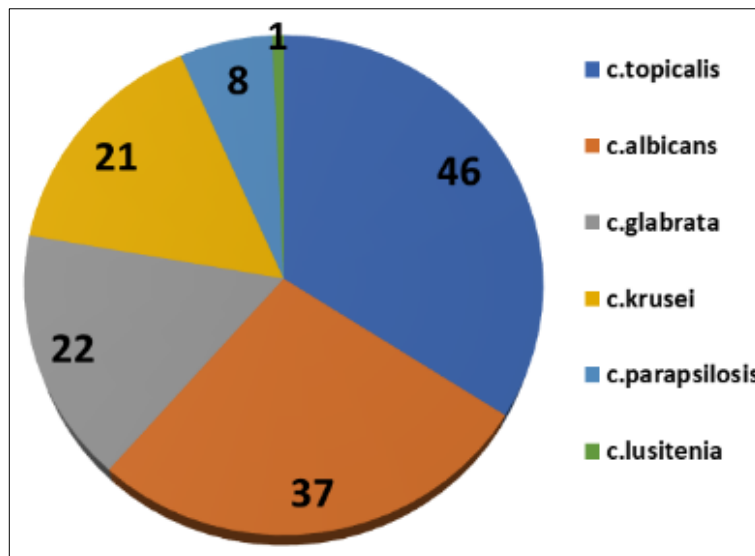

Fig 1: No of *Candida* specie

Discussion

The study identified the specific species of *Candida* that causes infections among patients who attended a tertiary care hospital in Mahatma Gandhi memorial medical, college, India.

Candida tropicalis is by far the most common species causing infection in humans in India. *Candida albicans*and non-a*lbicans* species are closely related but differ from each other with respect to epidemiology, virulence characteristic and antifungal susceptibility.

Distinction between species facilitates the understanding of epidemiology of *Candida* species particularly regarding the reservoir and mode of transmission which is requirement for the development of effective measures to prevent and control transmission of resistant pathogens.

In the present study it was found that candidiasis can occur at all ages and in both sexes. The youngest in our study was one month old baby while the oldest was 79 years and mean age was 37.3 years.

According to study conducted by Dalal *et al*.[5], Akorth *et al*.[6] maximum cases were in the age group of 21-40 years.

In the present study, females are more commonly affected than males with an incidence of 62 (60.2%) and 41(39.8%) respectively in a ratio of 0.66:1(M:F).

In a similar study by Kandhari KC *et al*. 20 at AIIMS, New Delhi [7].

In the present study, *Candida* species isolated from various clinical samples and the highest was from high vaginal swab (40.8%), followed by sputum (20.4%), oral thrush (11.7%), urine (5.8%), pus (5.8%), nail scrapings (4.9%), ear swabs (4.9%), stool (3.9%), blood (1%) and conjunctival swab (1%).

In this study *Candida* isolated from 20.4% sputum sample which correlates with the study done by yang *et al*.[8], who isolated *Candida* from 16% of sputum sample)

Yang *et al*.23l in Taiwan reported [8]*C. albicans*(69.1%) as the most common species, followed by *C.tropicalis* (12.9%) and *C. krusei* was isolated from 0.6% cases. In a study by Basu *et al*. 21 in Delhi [9] the *C. albicans*(45.8%) was the predominant isolate followed by *C. tropicalis* (24.7%), *C. krusei* (7%). This study is similar to above studies.

Conclusion

The foundation for early fungal aetiology detection is provided by this work. Earlier A correct diagnosis and knowledge of the drug and host characteristics involved are crucial for improving these patients' outcomes.

Source of funding

None.

Conflicts of interest

None declared.

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