Original Research Article

A study on isolation of Candida species in various clinical samples in a tertiary health care unit

B S G Sailaja[1], P D Prasad[2],*

[1]*Dept. of Microbiology, GSL Medical College & General Hospital, Rajahmundry, Andhra Pradesh, India*
[2]*Dept. of Pathology, Primary Health Center, Chittoor, Andhra Pradesh, India*

ARTICLE INFO

ABSTRACT

Introduction: Candida, the causative agents of candidiasis, reported as the seventh most common nosocomial pathogens. With this, current study is planned with an aim to identify Candida species in various clinical samples.

Materials and Methods: Study was conducted in the department of Microbiology, GSL Medical College, Andhra Pradesh from Jan 2019 to March 2019. Various clinical samples were collected from the patients, inoculated on SDA and Brain heart Infusion broth. After incubation, growth was identified using colony morphology, Gram staining, and urea hydrolysis test. Germ tube test and Chlamydopsore formation were used for species identification.

Results: During the study period, total 53 Candida species were isolated; 64% were identified as *Candida albicans* and 35% were non albicans Candida. The male female ratio was 1:2 and more strains were isolated among the individuals aged 20 – 40 years age; statistically there was no significant difference (P <0.005).

Conclusion: *Candida albican*s is common pathogenic. Gender wise, the rate of isolation was more among males and more stains were isolated in 30 – 40 years age group.

© 2019 Published by Innovative Publication.

1. Introduction

Candidiasis is the most common fungal disease in human caused by Candida species. Morphologically it is yeast fungus, one of the floral members. Various Candida species are reported to cause human infection, *Candida albicans* is the commonest pathogen.[1] Candidiasis is an opportunistic fungal infection, which may be mild mucosal infection and may cause life threatening invasive condition such as meningitis. Various factors of the Candida such as adhesions, enzymes released by the fungus and glycoprotein toxin favors the virulence of the pathogen.

Extreme age, immune suppressed condition, prolonged usage of antibiotics can damage the normal flora. In addition to these, Diabetes mellitus, Zinc, iron deficiency are the predisposing factors of Candidiasis. In the 1980s, Candida species were reported as the seventh most common nosocomial pathogens, ranking fourth in intensive care units.[2,3] With this, current study is planned with an aim to identify Candida species in various clinical samples.

2. Materials and Methods

Study was conducted in the department of Microbiology, GSL Medical College, Andhra Pradesh from Jan 2019 to March 2019. Various clinical samples such as Sputum, Stool, CSF, Urine, high Vaginal swab, Pus were collected from the patients.

Immediately after collection of sample, smears were prepared and inoculated on SDA incubated aerobically at 37^0 C for 24–48h. For blood culture, 8–10 ml venous blood was collected under sterile precautions, cultured in 45 ml Brain heart infusion (BHI) broth, incubated at $37°C$ for 96h before reported as no growth.[4]

Growth on SDA slope was processed for identification by colony morphology, Gram staining and urea hydrolysis test. Gram positive budding yeast cells with pseudohyphae on microscopic examination, yeast colony on SDA, and

* Corresponding author.
E-mail address: bsgsailaja@gmail.com (P. D. Prasad).

negative urea hydrolysis test were considered as Candida. Species identification was done by germ tube test and Chlamydopsore formation on corn meal agar.[5]

3. Results

During the study period, total 53 Candida species were isolated. The male female ratio was 1:2 and more strains were isolated among the individuals aged 20–40 years age; statistically there was no significant difference (P < 0.005). Of the 53 Candida isolates, 64%(34) were identified as *Candida albicans* and 35%(19) were non albicans Candida (NAC).
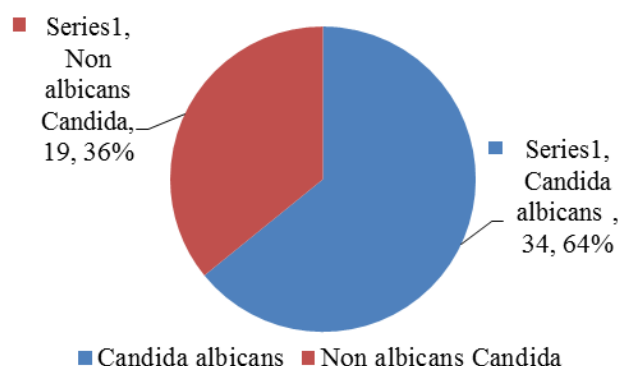

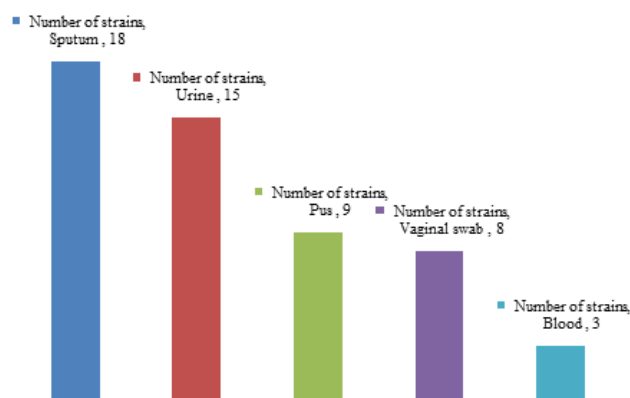**Fig. 1:** The graph showing numbers of Candida strains isolated

Fig. 2: Sample wise isolation of Candida

4. Discussion

Due to the rise in diabetes cases, increase use of antibiotics as well as immune suppressive agents and HIV, the incidence of yeast infections also increased significantly for the last two decades.[6] In this study, the rate of C.albinas isolation was 64%. Vigesh et al.[1] Manjunath et al.[7] also reported that C.albicans as predominant (51%) isolate.

However, higher incidence of NAC was reported in the literature .[8–10] Among the NAC, C.tropicalis was reported to be the predominant species. Arasi[6] also reported that C.tropicalis as the predominant NAC member. In the current study, the incidence of NAC is 35% and further species identification was not done in this study.

In this study, sample wise, maximum Candida species were isolated from Sputum (34%), followed by Urine (28 %), Pus (17%), Vaginal swab (15%) and blood (6%). In Arasi[6] report, majority of candida spp. were isolated from urine (41.6%), followed by sputum (20.4%), high vaginal swab (14%) and pus (6%). Of these >50 % of urinary candida isolates belongs to NAC. These finding were similar to that of Alvarez-Lerma et al.[11] and CA Kauffmann et al.[12] Sankarankutty Jay and Vipparti Harita[2] reported that more strains were isolated from Urine.

In this report, age wise, more number of Candida were isolated in 30–40 years group (32 %), followed by 20–30 (27%), 50–60 (15%), 40–50 (12%) and below 20(8%). Arasi[6] reported that more Candida strains in age group >60 years.

Gender wise, more Candida were isolated from women, the male female ratio was 1:2. As per Arasi et al. report,[6] most of the Candida were isolated from men (51.2%), male to female ratio was 1:0.95. R A Kashid et al.[13] also reported the isolation of Candida species was higher in males (5 5.10%) with male to female ratio of 1:0.81. In another study by Amar CS et al. more Candida isolates from male and the male female ratio was reported as 0.66:1.[14]

5. Conclusion

Candida albicans is a pathogenic species. Gender wise, the rate of isolation was more among males and more stains were isolated in 30–40 years age group.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Easow, Kanna BV, Kumar GA, Swapna M, Joshy M. Isolation and identification of candida species from various clinical samples in a tertiary care hospital. *Int J Res Med Sci*. 2017;5(8):3520–2.
2. Jay S, Harita V. Candida Species Isolated from Various Clinical Samples and their Susceptibility Patterns to Antifungals. *J Med Microbiol Infec Dis*. 2013;1(1):22–6.
3. Mokaddas EM, Al-Sweih NA, Khan ZU. Species distribution and antifungal susceptibility of Candida bloodstream isolates in Kuwait: a 10-year study. *J Med Microbiol*. 2007;56(2):255–259.
4. Khadka, Sherchand, Pokhrel, Parajuli, Mishra, et al. Isolation, speciation and antifungal susceptibility testing of Candida isolates from various clinical specimens at a tertiary care hospital. *BMC Res Notes*. 2017;10:218–23.

5. Sastry AS. Essentials of Medical Microbiology. Jaypee Brothers Medical Publishers ; 2018,. Second edition.

6. Saikumar C, Samyuktha AA. Isolation, Identification and Speciation of Candida Species from Various Clinical Specimens in a Tertiary Care Hospital in Chennai. *Sch J App Med Sci*. 2017;5(8F):3460–8.

7. Manjunath V, Vidya GS, Sharma A, Prakash MR, Murugesh N. Speciation of Candida by Hi-Chrom agar and sugar assimilation test in both HIV infected and non-infected patients. *Int J Biol Med Res*. 2012;3(2):1778–82.

8. Vijaya D, Harsha TR, Nagaratanamma T. Candida speciation using CHROM agar. *J Clin Diagn Res*. 2011;5(4):755–7.

9. Murray MP, Zinchuk R, Larone DH. CHROM agar Candida as the sole primary medium for isolation of yeast and as a source medium for the rapid-assimilation of trehalose test. *J Clin Microbiol*. 2005;43:1210–2.

10. Golia S, Reddy KM, Karjigi KS, Hittinahalli V. Speciation of Candida using chromogenic and cornmeal agar with determination of fluconazole sensitivity. *Al Ameen J Med Sci*. 2013;6(2):163–169.

11. lvarez Lerma F, Nolla-Salas J, Len C, Palomar M, Jord R, Carrasco N. Candiduria in critically ill patients admitted to intensive care medical units. *Intensive Care Med*. 2003;29(7):1069–76.

12. and CAK. Candiduria ; 2005,. Supplement 6.

13. Kashid RA, Belawadi S, Devi G, Dadich D. Characterization and antifungal susceptibility testing for Candida species in a tertiary care hospital. *J Health Sci Res*. 2011;2(2):1–7.

14. Amar CS, J A, Hajare V, Belagali Y. Study of prevalence and antifungal susceptibility of candida. *Int J Pharm Bio Sci*. 2013;4(2):361–81.

Author biography

B S G Sailaja Assistant Professor

P D Prasad Pathologist