

PHENOTYPIC DETECTION OF MYCOTIC INFECTION AND THEIR CLINICAL OUTCOME IN PATIENT ATTENDING A TERTIARY CARE CENTRE IN EASTERN BIHAR

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Abstract

Background: In the recent years, there has been an upsurge in the fungal infections in humans owing to the increase in opportunistic fungal infections as a result of rise in the no. of immunocompromised individuals. *Candida* spp. is the most common fungus isolated from sputum. Conventional methods such as direct microscopy and culture remains to be the gold standard. Vitek2 can identify rare species of *Candida* which is not possible by conventional methods. Azole group of drugs shows maximum sensitivity to *Candida* spp. **Materials and Methods:** This prospective hospital-based study was conducted in Katihar Medical College from September 2022 to July 2023. Clinically suspected samples namely skin scrapings, nail clippings, epilated hair and sputum were taken. All the clinical sample were processed according to standard protocol. **Result:** 184 (55.25%) were positive in direct microscopy and were processed. Out of these 184 samples, 56.52% were *Candida albicans*, *Aspergillus fumigatus* (18.47%), *Candida tropicalis* (9.23%), *Candida guilliermondii* (4.34%), *Aspergillus niger* (4.89%), *Candida glabrata* (5.97%), single isolate of *Candida cerifera* (0.54%). Female predominance (74%) was seen. Sugar assimilation test was done using various sugars namely Glucose, Maltose, Sucrose, Lactose, Galactose, Trehalose, Raffinose, xylose. Out of 184 samples, 36 (19.56%) were sputum, 22 (11.95%) skin scrapings, 2 (1.01%) were nail clippings, 7(3.80%) were hair pluckings, maximum number of samples were of urine 117 (63.58%). **Conclusion:** Fungal infection is on rise in our region due to favourable condition promoting the growth of fungus. In this study we have concluded that incidence non albicans *Candida* is also increasing gradually.

INTRODUCTION

In the recent years, there has been an upsurge in the fungal infections in humans owing to the increase in opportunistic fungal infections as a result of rise in the no. of immunocompromised individuals. *Candida* spp. is the most common fungus isolated from sputum. Conventional methods such as direct microscopy and culture remains to be the gold standard. Vitek 2 can identify rare species of *Candida* which is not possible by conventional methods. Azole group of drugs shows maximum sensitivity to *Candida* spp.^[1-3]

Aims and Objective

1. Isolation of yeast and mould from various clinical samples received in the Microbiology department.
2. Identification of fungal isolates.
3. To perform Antifungal sensitivity testing in case of yeast.

4. To study risk factors, clinical features and clinical outcome in case of fungal infection.

MATERIALS AND METHODS

This prospective hospital-based study was conducted in Katihar Medical college from September 2022 to July 2023. Clinical samples from patients suspected of having fungal infection were included in the study. Clinical samples included were skin scrapings, nail clippings, epilated hair and sputum.

Inclusion Criteria

All samples which were found to be KOH mount or direct gram stain positive were included in the study.

Exclusion Criteria

All patient with a history of intake of antifungal agents.

All the clinical sample were processed according to standard protocol.1 KOH mount of epilated hair, nail clippings and skin scraping were done. Gram stain of

sputum was observed under the microscope for presence of fungal elements. A Culture of the sample was done on SDA. Further identification was done by Gram staining of the isolated colony. Germ tube had been put up for Gram positive budding yeast cell. Yeast cells were inoculated into 0.5 ml of fetal bovine serum and incubated at 37°C for 2.5 h. After this period, aliquots were removed for microscopic examination. Germ tube was considered as a slender tube with straight walls without septum and without constriction at the junction between the cells.² A CHRO Magar was put up for budding yeast cell for further identification of *Candida* spp.

Sugar assimilation test was done using various sugars namely Glucose, Maltose, Sucrose, Lactose, Galactose, Trehalose, Raffinose, xylose. Sugar assimilation test media was prepared by using basal media with 6.75% Yeast Nitrogen Base and 2% agar. Assimilation was interpreted positively if there was growth around the disc containing the carbohydrate and negative if there is no growth. All the samples were put up in Vitek2 and their results was compared with those of conventional technique.

RESULTS

333 samples were received in the department of Microbiology during the study period. Among the total number of samples, 184 (55.25%) were positive in direct microscopy and were processed. Out of these 184 samples, 56.52% were *Candida albicans*, *Aspergillus fumigatus* (18.47%), *Candida tropicalis* (9.23%), *Candida guilliermondii* (4.34%), *Aspergillus niger* (4.89%), *Candida glabrata* (5.97%), single isolate of *Candida cerifera* (0.54%). Female predominance (74%) was seen.

Maximum number of cases (56%) were in 40 to 60 years age group. Out of 184 samples, 36 (19.56%) were sputum, 22 (11.95%) skin scrapings, 2 (1.01%) were nail clippings, 7 (3.80%) were hair pluckings, maximum number of samples were of urine 117 (63.58%).

Candida spp. shows maximum sensitivity to Azole group of drugs (Fluconazole and Voriconazole). *Candida albicans* shows maximum resistance to Caspofungin.

Fungal infection in urinary tract was seen more in catheterized patients admitted in ICU (26%)

Patients who were immunocompromised and with oral thrush were seen to have high risk of *Candida albicans* infection.

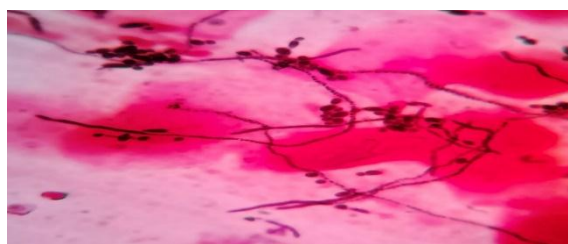


Figure 1 Gram positive budding yeast cell with pseudohyphae seen in sputum.

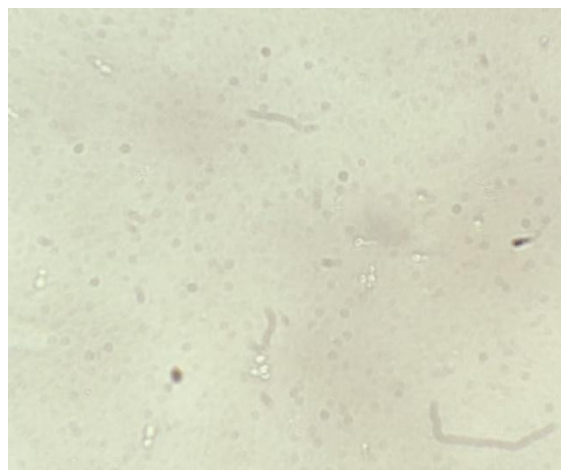


Figure 2: Positive Germ tube test in *Candida albicans*.

DISCUSSION

Candida spp. are the most common pathogen implicated in healthcare infections. Due to this, quick and early isolation and antifungal susceptibility is necessary for the clinicians to choose the best drug for the patient. Most number of yeasts isolated in this study were from urine (63.58%) followed by sputum sample (11.95%). Urvashi Chongtham et al. observed maximum isolates were obtained from sputum (43%) followed by urine (34%).^[4]

In this study we have seen female (74%) predominance over male. A study done by Sarika G et al. shows similar result, where 82.05% were females.^[5]

In our study, maximum number of cases were seen in the age group 40 to 60 years (56%). Another study done by Oluranti J obisean et al. shows maximum number of cases (53.9%) in the age group of 31-45 years.^[6]

Yeasts isolated in our study show maximum sensitivity to azole group of drugs such as fluconazole. Similar sensitivity pattern (88.95%) was shown in a study done by Ravinder kaur et al.^[7]

Among the non *albicans* *Candida*, *Candida tropicalis* (9.23%) was the most common isolate. In a study conducted by Hitesh R Ahir and Bhavesh P. Gohil where 49 out of 188 *Candida* species was *Candida tropicalis* that is 26.06%.

CONCLUSION

Fungal infection occurrence is fairly high in our region. More incidence of fungal infection is seen in immunocompromised patient who came with a history of longstanding fever and cough not responding to antibiotics. Urinary involvement is seen more in patients with history of catheter insertion of more than 1 week duration. In this study we have concluded that incidence non *albicans* *Candida* is also increasing gradually.

Antifungal sensitivity pattern in case of Yeast shows sensitivity to most of the antifungal agents such as Voriconazole, Fluconazole, Micafungin and

Amphotericin B which is favourable in treating fungal infection. Amphotericin B was never a first choice of treatment as it is a very expensive drug. We must use antifungal drug judiciously in order to prevent resistance.

REFERENCES

1. Standard Operating Procedures for fungal Identification and detection of Antifungal Resistance, ICMR 2nd Edition, 2019 1-33.
2. Saigal S, Bhargava A, Mehra S K, Dakwala F, Identification of candida albicans by using different culture medias and its association in potentially malignant and malignant lesions; contemp clin Dent. 2011 Jul;2(3):188-93
3. Chongtham U, Athokpam D C, Kumar Singh RM; Isolation, Identification and Antifungal susceptibility testing of Candida species Journal of Clinical and diagnostic Research: A cross-sectional study from Manipur, India 2022 April, Vol-16 (4): DC09-DC14.
4. Ahir H R, Gohail BP; Prevalence of fungal infections in patients attending care teaching hospital, middle Gujarat, Indian journal of Microbiology Research, July- September, 2018;5(3):344-367
5. Muzaheed et al; A 20-year retrospective clinical analysis of Candida infections in tertiary center: Single center experience; Journal of Infection and Public Health 15 (2022) 69-74
6. Gupta S, Agarwal P, Rajawat R, Gupta S; Prevalance of dermatophytic infection and determining sensitivity of diagnostic procedure; Int J Pharm Sci, Vol 6, Issue 3, 35-38.
7. Kaur R, Dhakad MS, Goyal R, Haque A, Mukhopadhyay G, Identification and antifungal testing of candida species: A comparison of Vitek-2 system with conventional and molecular methods; J Glob Infect Dis. 2016 Oct-Dec;8(4):139-146.