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Prevalence of *Candida* Species with their Antifungal Susceptibility Pattern from Blood and Urine Cultures in Gauhati Medical College Hospital, Guwahati, India

Nabajit Deka* **and N.K. Hazarika**

Department of Microbiology, Gauhati Medical College Hospital, Guwahati-781032, Assam, India
**Corresponding author*

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A B S T R A C T

Although yeast cells are often present as benign commensal organisms of healthy individuals, specially Candida has become emerge pathogen in last few decades due to various factors like AIDS and increased number of patients receiving immunocompromised drugs during organ transplantation and cancer therapy. Along with rise of incidence of candida infection, the emergence of drug resistance further worsens the situation. So we have studied the prevalence of candida species from blood and urine sample. Out of total 167 samples, *C. albicans* were identified as 44 (26.3%) and remaining 123 (73.65%) were Non Albican Candida (NAC). Among Non Albican Candida (NAC), *C. krusei* was major isolate i.e.48 (28.7%) followed by *C. tropicalis* (14.9%) and other non-albicans Candida species. In our study about the susceptibility pattern of candida species to Amphotericine B, Fluconazole, Itraconazole, Voriconaole, Ketoconazole, Nystatin we have found that *C. albicans* was found resistant to Fluconazole, Ketoconazole in 22.7% and 13.6% cases respectively. For NAC, resistance to Fluconazole was found maximum in *C. krusei* 20 (41.6%) out of 48 isolates followed by *C. parapsilosis* 3 (13%) and *C. tropicalis* 3 (12%) out of 23 and 25 isolates respectively. No resistance was detected against Amphotericine B, Voriconazole, Nystatin and Itraconzole except *C. tropicalis* which is 2 (8%) out of 25 isolates against Itraconazole. On the other hand all *C. glabrata* isolates were sensitive to all antifungals.

Introduction

Human pathogenic yeasts are generally present in the environment and some species belong to human being as a normal flora. But now days, the rise of incidences of fungal infection had received serious attention and specially Infection of *candida species* has changed in last few decades due to various factors like AIDS, increased number of patients receiving immunocompromised drugs during organ transplantation or cancer therapy. In Recent studies, candida species is recognized as a major agent of nosocomial infections. Along with increased number of clinical cases, the emergence of drug resistance further worsens the situation. Such incidences are clearly on the rise. Data from the ongoing studies showed the NAC also become resistant against Azole drugs which is important factor for physicians and microbiologists. So, present study was done to identify distribution of various Candida spp. to species level from blood and urine

sample and to find out the antifungal susceptibility pattern of these isolated Candida isolates.

Materials and Methods

Place and duration of the study

The study was conducted at the Department of Microbiology, Gauhati Medical College Hospital, Assam.

Sample group

Clinically suspected patients of age group 5-60 years attending OPDs and IPDs in department of Medicine, Pediatrics and OBG of Guwahati Medical College, will be enrolled based upon the requisition made by the treating clinicians.

Sample

Blood and urine sample from the patients suspected having fungal infection were cultured to isolate the infecting fungi.

Processing of samples

After collecting the samples, they are cultured on Sabouraud Dextrose Agar (SDA) with chloramphenicol and incubated at 30°c for 48 hrs. After that they are phenotypically identified according the Colony morphology (acc to Milan and Zaror), Germ-tube test, Chlamycoconidia production test, Chromogenic agar culture method, Urease test, Carbohydrate fermentation test and Carbohydrate assimilation Test using yeast nitrogen base agar. The Blood samples were confirmed by using yeast card of Vitek 2 machine. Antifungal susceptibility testing of the isolated yeasts was done in according to the proposed guidelines for disk diffusion method and MIC strip test Method based on the CLSI standard. Antifungal susceptibility testing was performed using fluconazole, clotrimazole, itraconazole, ketoconazole, amphoteracin B and nystatin.

Results and Discussion

All 167 candida species were found positive with microscopy and culture. After that these isolates were further identified. Out of total 167 samples, *C. albicans* were identified as 44 (26.3%) and remaining 123 (73.65%) were Non Albican Candida (NAC). Among Non Albican Candida (NAC), *C. krusei* was major isolate i.e. 48 (28.7%) followed by *C. tropicalis* 25(14.9%) and other non-albicans Candida species which is summarized in Table 1 (Fig. 1).

Among 167 specimens, 37 were Blood specimens and 130 were urine specimens. Here out of 37 blood specimens, *C. albicans* were isolated only 4 nos (i.e.10.8%) where *C. krusei* was major NAC isolates i.e.19 (51.3%) followed by *C. tropicalis* (18.9%), *C. glabrata* (13.5%), *C. parapsilosis* (5.4%). On the other hand, Out of 130 urine specimens, *C. albicans* were isolated 40 nos (30.7%) where *C. krusei* was again major NAC isolate i.e.29 (22.3%) followed by *C. parapsilosis* (16.1%), *C. glabrata* (14.6%) *C. tropicalis* (13.8%) and *C. dubliniensis* (2.3%). All these data are summarized in Table 2 (Fig. 3).

In our study about the susceptibility pattern of candida species to Amphotericine B, Fluconazole, Itraconazole, Voriconaole, Ketoconazole, Nystatin we have found that *C. albicans* was found resistant to Fluconazole, Ketoconazole are 10(22.7%) and 6(13.6%) cases respectively out of 44 isolates. For NAC, resistance to Fluconazole was found maximum in *C. krusei* 20(41.6%) out of 48 isolates followed by *C. parapsilosis* 3(13%) and *C. tropicalis* 3 (12%) out of 23 and 25 isolates respectively. No resistance was detected against Amphotericine B,

Voriconazole, Nystatin and Itraconzole except *C. tropicalis* which is 2 (8%) out of 25 isolates against Itraconazole. On the other hand all *C. glabrata* isolates were sensitive to all antifungals. All data are showed in Table 3 (Fig. 2).

Vaghela Geeta *et al*, (2015), in a study on Susceptibilty of Candida species to antifungal drugs in western India mentioned that, Non albican candidas were major isolates 61.5% where *C. Albicans* were 38.5%. Among Non Albican Candid (NAC), *C. glabrata* was 36 (26.7%) followed by *C. tropicalis* 25(18.5%) *C. parapsilosis* 15(11.1) and *C. guilliermondi* 7(5.2). They have studied antifungal susceptibility testing for only Fluconazole, Itraconazole and Amphotericine B by disc diffusion method. In their study, *C. albicans* was found resistant to Fluconazole, Itraconazole and Amphotericine B in 3.8%, 3.8% and 1.9% cases respectively. For NAC, resistance of Fluconazole, Itraconazole and Amphotericine B was found in 4.8%, 3.6% and 2.4% cases respectively. Resistance to Fluconazole and Itriconazole were found maximum in *C. parapsilosis* (1). Here in our study, *C. albicans* were identified as 44 (26.3%) and remaining 123 (73.65%) were Non Albican Candida (NAC). Among Non Albican Candida (NAC), *C. krusei* was major isolate i.e.48 (28.7%) followed by *C. tropicalis* 25(14.9%) and other non-albicans Candida species. But in our study we have found *C. krusei* was mostly resistant against Fluconazole i.e. 41.6% followed by *C. albicans* i.e. 22.7%, *C. parapsilosis* i.e. 13%, *C. tropicalis* i.e. 12%. On the other hand *C. albican* isolates were resistant to Ketoconazole i.e.13.6 %.No any isolates were found resistance against Amphotericine B, Intraconazole and Nystatin.

Table.1 Distribution of *Candida* species isolates

Species	**Number of Isolates**
Candida albicans	44
Candida krusei	48
Candida tropicalis	25
Candida parapsilosis	23
Candida glabrata	24
C.dubliniensis	3
Total	167

Table.2 Specimen wise distribution *Candida* species isolates

Species	**Blood**	**Urine**
Candida albicans	4	40
Candida krusei	19	29
Candida tropicalis	7	18
Candida parapsilosis	2	21
Candida glabrata	5	19
C.dubliniensis	0	3
Total	37	130

Table.3 Antifungal resistant profile of isolated *Candida* species

Species	FLC	KT	IT	AP	NS	VRC	Total
Candida albicans	10	6	0	0	0	0	16
Candida krusei	20	0	0	0	0	0	20
Candida tropicalis	3	0	2	0	0	0	5
Candida parapsilosis	3	0	0	0	0	0	3
Candida glabrata	0	0	0	0	0	0	0
C.dubliniensis	0	0	0	0	0	0	0

** FLC=Fluconazole, KT=Ketoconazole, IT=Itraconazole, AP=Amphoteracin B NS=Nystatin and VRC=Voriconazole

Fig.1 Distribution of *Candida* species in clinical specimen

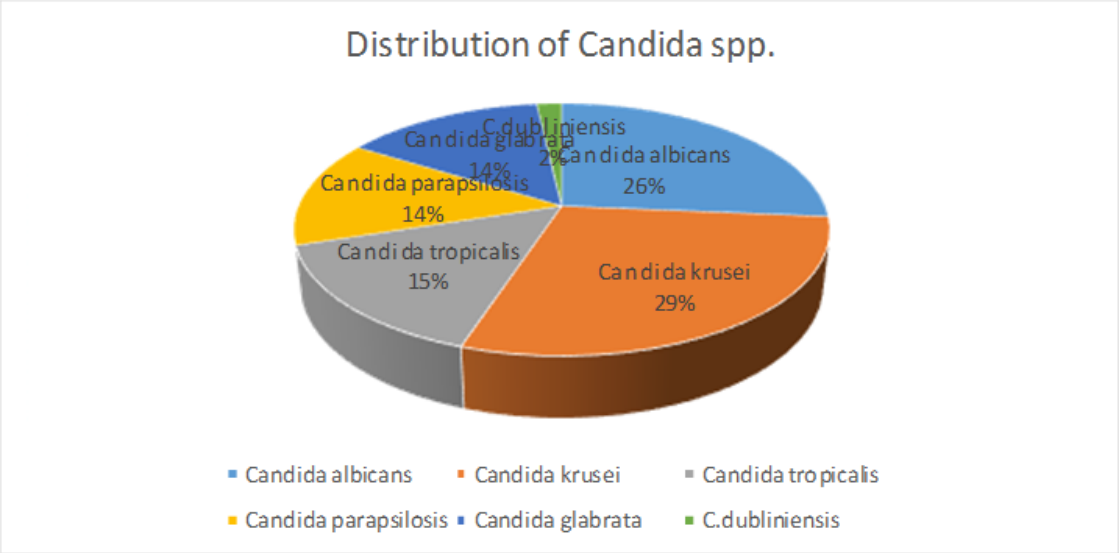


Fig.2 Resistant pattern of *Candida* species against fluconazole

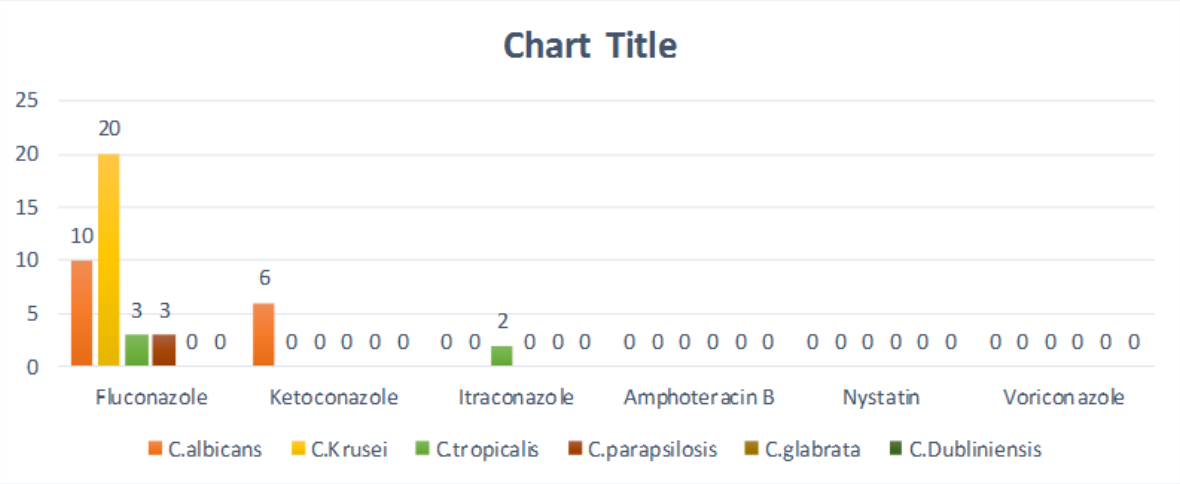
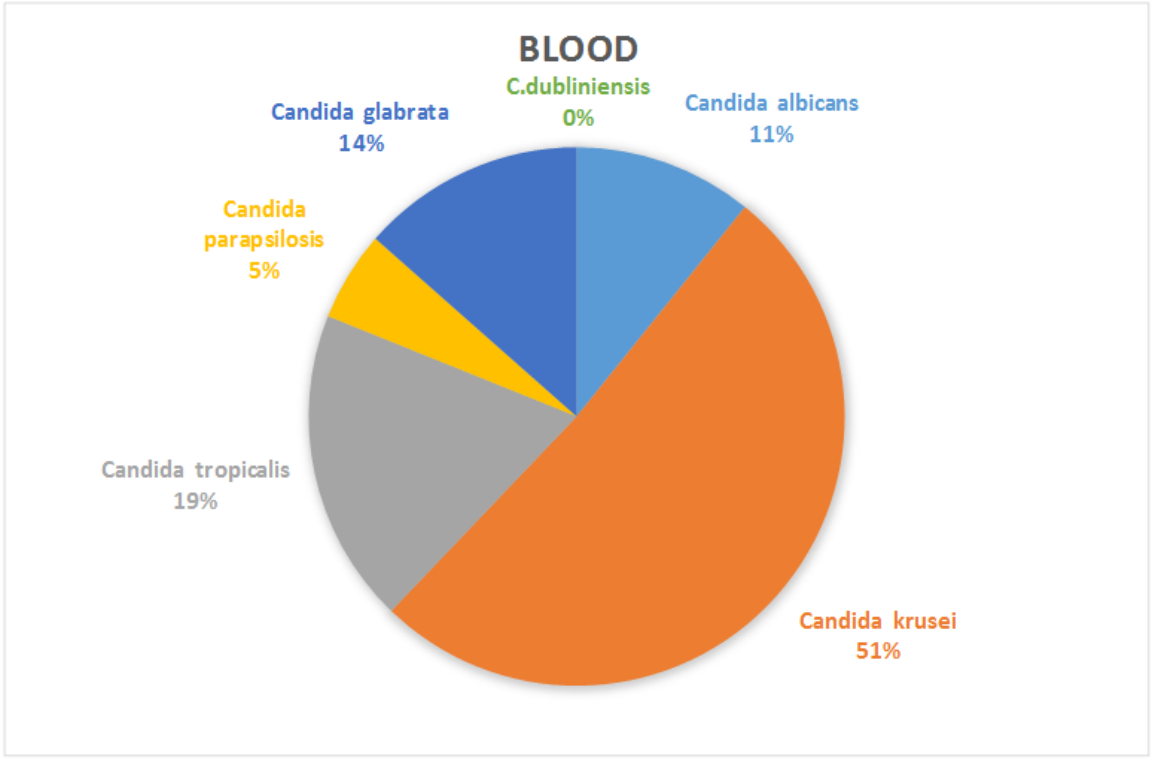
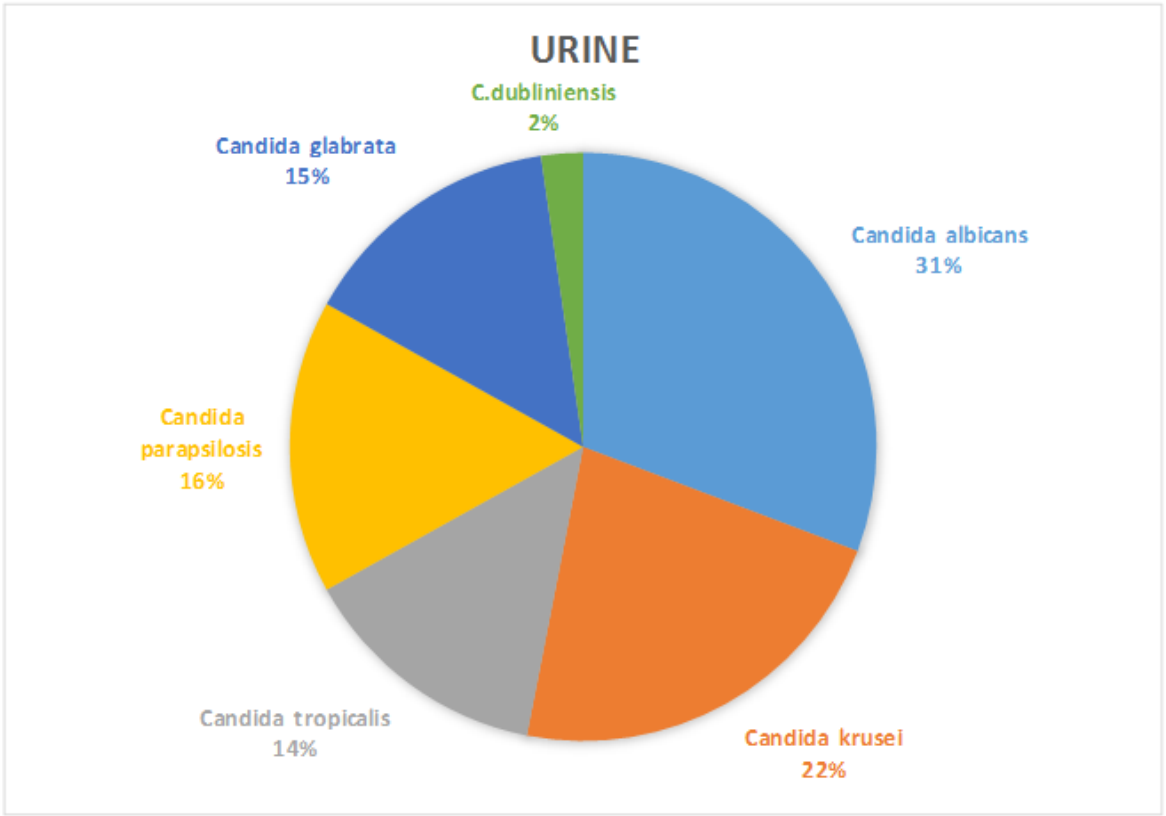


Fig.3 Distribution of *Candida* species according to its sample





Khan Anwar *et al.*, (2015) in a study Antifungal Susceptibility Pattern of Candida Isolates from a Tertiary Care Hospital of North India: A Five Year Study stated that *C. albicans* was most commonly isolated species followed by *C. parapsilosis*, *C. krusei* and other NAC. In their study, they have indicated that Fluconazole was most commonly resistant drug followed by Ketoconazole, Clotrimazole (Bassetti Matteo *et al.*, 2013). Here in our study, we also have found candida species was mostly resistance against Fluconazole followed by Ketoconazole. But in our study we have found *C. krusei* as a major isolate 28.7% where *C. albican* was found as 26.3%.

Bhattacharyya Kumkum *et al.*, (2015), in a study titled as Prevalence of *Candida* species with their antifungal susceptibility pattern from blood cultures of neonatal septicaemia cases in neonatal intensive care unit (NICU) from a tertiary care hospital in Kolkata (West Bengal) stated that out of 114 positive Candida species, *C. tropicalis* (58%) was species followed by *C. krusei* (25%), *C. parapsilosis* (12%) and *C. albicans* (5%) respectively. *C. tropicalis* showed (71.2%) sensitivity to the commonly used Azole group of drugs, but were highly sensitive to Caspofungin, Voriconazole and Amphotericin B.

In this study, they have mentioned one important point that all isolates of *C. krusei* were resistant to Fluconazole but highly sensitive to new drugs like Caspofungin, Voriconazole (Bhattacharyya Kumkum, *et al.*, 2015). In the present study found that *C. krusei* as a major isolate i.e.51.3% from the blood samples followed by *C. tropicalis* (18.9%), where 36.8% C. *krusei* is resistant against Fluconazole. Here also we have found *C. krusei* is sensitive to all new drugs like Amphotericin B and Voriconazole.

On the other hand, no other isolates found resistant to any other antifungal drugs.

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References

Aher Changdeo S *et al.*,March, 2014: Species distribution, virulence factors and antifungal susceptibility profile of Candida isolated from Oropharyngeal lesions of HIV infected patients. International Journal of Current Microbiology and Applied Sciences, Volume 3 Number 1 (2014) pp. 453-460,2014

Bassetti Matteo *et al.*,December 2013 Epidemiology, Species Distribution, Antifungal Susceptibility, and Outcome of Candidemia across Five Sites in Italy and Spain, Journal of Clinical Microbiology Volume 51 Number 12. Pp. 4167–4172

Bhattacharyya Kumkum *et al.*,May, 2015, Prevalence of *Candida* species with their antifungal susceptibility pattern from blood cultures of neonatal septicaemia cases in neonatal intensive care unit (NICU) from a tertiary care hospital in Kolkata (West Bengal), Current Research in Microbiology and Biotechnology, Volume-3, Issue-3 (2015), Pp. 628-631.

Deepa K *et al.*,December, 2014. Crom Agar Candida for species level identification of isolates of candida species from oral cavity., African Journal of

Microbiology Research, Vol. 8(50), pp. 3918-3922.

Deorukhkar Sachin C. *et al.*,, October, 2014: Non-albicans Candida Infection: An Emerging Threat. Interdisciplinary Perspectives on Infectious Diseases Volume 2014, Article ID 615958, 7 pages.

Hedayati Taghi Mohammad *et al.*,18th April, 2015, Isolation of Different Species of Candida in Patients With Vulvovaginal Candidiasis From Iran (sari) Jundishapur Journal of Microbiology. 2015 April; 8(4): e15992.

Khan Anwar Parvez etal, 2015,Antifungal Susceptibility Pattern of Candida Isolates from a Tertiary Care Hospital of North India: A Five Year Study, International Journal of Current Microbiology and applied Sciences, Volume-1, Special issue-1,2015,P.177-181

Sanguinetti Maurizio *et al.*,June, 2015, Antifungal drug resistance among Candida species: mechanisms and clinical impact, Mycoses © Blackwell Verlag GmbH, Volume 58, Issue S2, June 2015, P.2-13

Vaghela Geeta M *et al.*,June, 2015, Susceptibility of candida species to Antifungal drugs in western India, National journal of medical Research, Volume-5, Issue-2, April-June 2015, P.122-126.

Yang *et al.*,2014: Epidemiology, species distribution and outcome of nosocomial Candida spp. bloodstream infection in Shanghai. BMC Infectious Diseases 2014, 14:241. http://www.biomedcentral.com/1471-2334/14/241

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