



Prevalence of *Candida albicans* /Non albicans species in clinically suspected cases of vulvo vaginitis in antenatal women and their susceptibility to commonly used antifungals

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Abstract

Introduction: Vulvovaginal candidiasis is a common problem affecting reproductive aged women. *Candida Albicans* species were the most common pathogen implicated in these cases. But recently there has been reports of Non Albicans *Candida* species emerging as new pathogens from different parts of the world and they are reported to be less sensitive to the commonly used antifungal drugs. We tried to find out the most prevalent species of *Candida* among our antenatal population and their drug sensitivity patterns

Objectives of the study: 1) to isolate different *Candida* species in culture from clinically diagnosed case of vulvovaginal candidiasis in reproductive aged women

2) To speciate the isolates using phenotypic characters and anti-fungal susceptibility of the isolates in vitro

Study Design: Cross sectional prospective study

Study Setting: Department of Obstetrics and Gynaecology, and Department of Microbiology, Government medical college, Thiruvananthapuram

Study Period: 2017 1st January to 31st December

Study Population: Antenatal women with clinical diagnosis of vulvo vaginal candidiasis attending the hospital for antenatal and intrapartum care.

Results: vaginal swabs from 400 clinically suspected cases of vulvo vaginal candidiasis were collected and examined in culture for identification of *Candida* species. 70.5% of women belonged to 20-29 age group and 15.8% in 30-39 year age group. 65 cultures (16.3%) were positive for *Candida*. Rest of the cultures were negative for fungal growth. Out of 65 cases 30(46.2%) were *Candida Albicans* species. And 35 cases (53.8%) were Non albicans *Candida* species. (NAC) Among the NAC, *Candida tropicalis* was the most predominant strain in our study population (24.6%), followed by *C. Glabrata* (16.9%) and *C. Parasilosis* (12.3%) as the other isolates. Antifungal susceptibility was tested against 3 major antifungals namely fluconazole, clotrimazole and Amphotericin-B. Studies showed that drug resistance to all the 3 antifungals were present among 10% of *Candida Albicans* strains only. Among the NAC, all the strains were sensitive to the standard antifungals and drug resistance could not be demonstrated.

Conclusion: Among the antenatal women with vulvovaginal candidiasis, Non albicans *Candida* was a predominant strain and the strains were sensitive to standard antifungals used.

Keywords: Vulvovaginal candidiasis, *Candida Albicans*, Non Albicans *Candida*, Drug sensitivity.

Introduction

Approximately 75% of women experience at least one episode of vulvovaginal candidiasis and during their lifetime and nearly half of them suffer multiple episodes.⁽¹⁾ About 5% of women suffer recurrent episodes of vulvovaginal candidiasis defined by more than or equal to 4 episodes in a year.⁽²⁾ The majority of them are caused by *Candida Albicans*, however resorts of vulvovaginal candidiasis due to non-*Albicans* species are increasing.^(1,3)

Clinical manifestations caused by Non-*Albicans* species is indistinguishable from *Candida* species but they differ in their susceptibility to commonly used antifungal agents and demonstrate a drug resistance to commonly used antifungals.⁽⁴⁾

Virulence and antifungal susceptibility of *Candida* isolates differ according to the species⁽⁵⁾ The available therapeutic options for vulvovaginal candidiasis include imidazole and triazole agents in topical and oral forms⁽⁶⁾. Azoles are the treatment of choice for vulvo vaginitis in many countries, however development of resistance to these drugs have been reported from yeast isolates from vulvo vaginal candidiasis⁽⁷⁾.

The present study was done aiming to assess the prevalence and anti-fungal susceptibility patterns of various types of *Candida* species in pregnant women attending hospitals for antenatal or intranatal care in our hospital.

Materials and Methods

The study was conducted jointly in the department of Obstetrics and Gynaecology and Dept of microbiology of a tertiary care teaching Institute. The protocol of the study was discussed in the Institutional Review Board. Primary objective of the study was to isolate the different *Candida* species in culture from clinically diagnosed cases of vulvo vaginal candidiasis in reproductive age group women. Secondary objectives of the study was to speciate the isolates using phenotypic characters and to analyse the antifungal susceptibility in vitro. This was done as a cross sectional prospective study. Antenatal patients

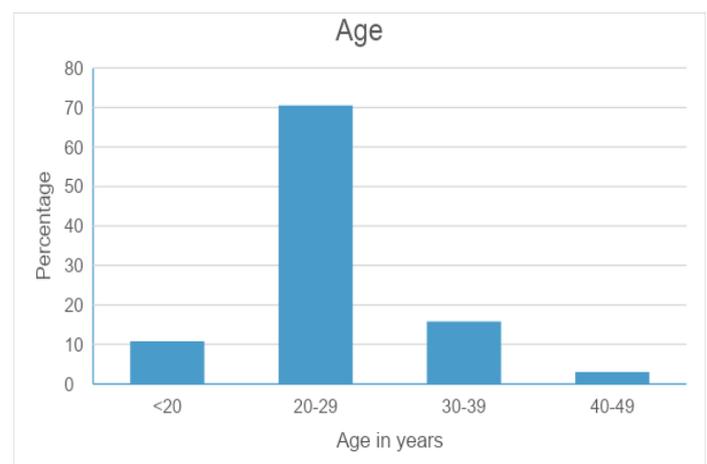
attending the antenatal OPD and in patients with clinical features of vulvo vaginal candidiasis were the subjects of the study. Consent was taken from participants after explaining about the study and procedure of sample collection.

Two vaginal were collected from posterior vaginal fornix using Sim's speculum under aseptic precautions and transported to lab in separately labelled containers. Swabs were gram stained and cultured on Sabaraud's dextrose Agar. Colonies suggestive of *Candida* were identified and further speciated using germ tube test, chlamyospore formation, sugar fermentation and sugar assimilation test. Antifungal susceptibility in vitro was done by Kirby Bauer method using Muller Hinton agar with 2% glucose and Crystal violet for commonly used antifungals like fluconazole, Clotrimazole and Amphotericin Data was analysed using SPSS software.

Results

This study was done during 2017 January to December. 400 Samples from cases with clinical symptoms of vulvovaginitis were examined for identification of *Candida* species. 70.5% of women belong to 20-29 year age group followed by 30-39 year age group (15.8%).

The age group of the cohort (table 1)

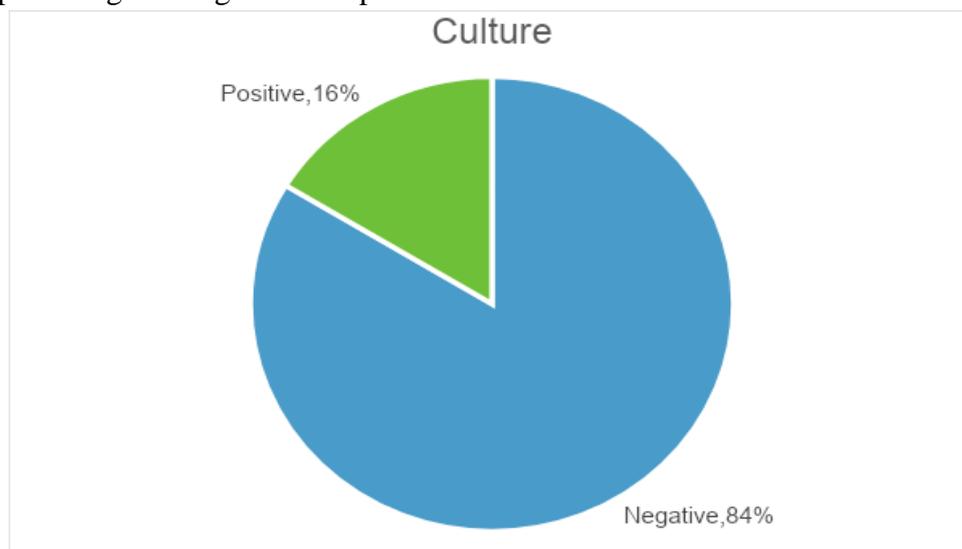


65 cultures (16.3%) were positive for *Candida* species. Rest were negative for fungal growth. Out of the 65 cases of *Candida* isolated from the clinical specimens, 30 (46.2%) were *Candida albicans*, and 35 (53.8%) were Non *Albicans*

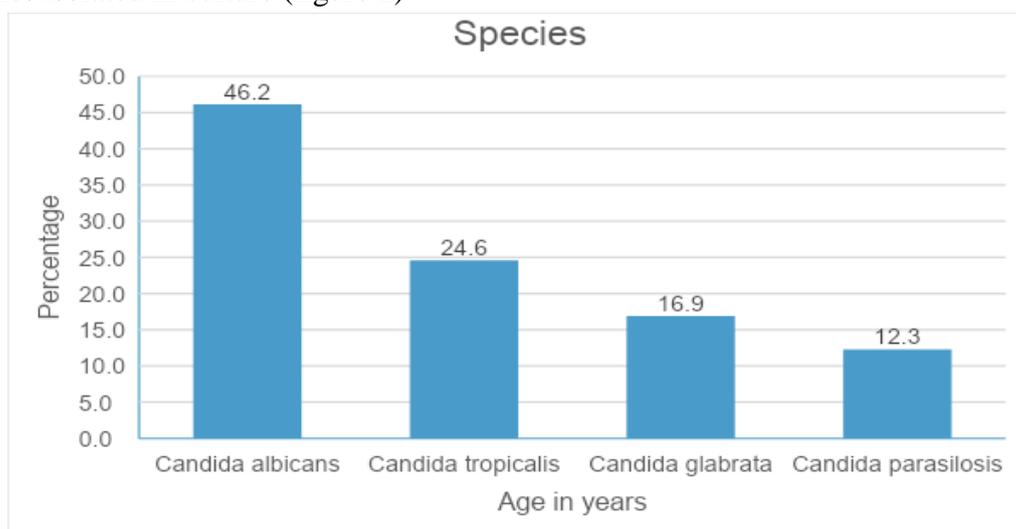
Candida (NAC). Among the NAC, Candida tropicalis (24.6%), followed by Candida Glabrata

(16.9%) and Candida Parasilosis (12.3%) were the major isolates

Figure showing percentage of fugal culture positive isolates



Different species isolated in culture (figure 2)



Antifungal susceptibility profile of the isolated strains were examined which shows that drug resistance was present in 10% of candida albicans species to all the three antifungals tested namely

Fluconazole, Clotrimazole and Amphotericin B. Among NAC species, drug resistance studies showed that All the NAC species were sensitive to the commonly used antifungals.

Drug		Species							
		Candida albicans		Candida Tropicalis		Candida Glabrata		Candida Parasilosis	
		N	%	n	%	N	%	N	%
Fluconazole	Resistant	3	10	0	0	0	0	0	0
	Sensitive	27	90	16	100	11	100	8	100
Clotrimazole	Resistant	3	10	0	0	0	0	0	0
	Sensitive	27	90	16	100	11	100	8	100
Amphotericin B	Resistant	3	10	0	0	0	0	0	0
	Sensitive	27	90	16	100	11	100	8	100

Discussion

Vulvo vaginal candidiasis is a very common condition affecting up to 70-75% of reproductive age group women at least once in their life time. And up to 10% of these women develop recurrent VVC defined as at least 4 episodes of VVC during a 12 month period. Risk factors for VVC include extremes of age, prolonged recent broad spectrum antibiotic use, pregnancy, uncontrolled diabetes and Oral contraceptive use. Uncontrolled diabetes, with increased glycogen content, lowers the vaginal pH results in candida colonisation and alter the vaginal microbiotome (Vaginal dysbiosis) and predispose to infections⁽⁸⁾. And NAC species is found to be a significant pathogen in diabetic women with *C.Glabrata* and *C.Tropicalis* as frequent isolates.⁽⁹⁾

Albicans is the most common pathogenic agent of VVC, but recent studies suggest that the prevalence of NAC is increasing globally. NAC is more commonly associated with complicated VVC⁽¹⁰⁾. Among NAC, *C.Glabrata*, *C.Krusei*, *C.Tropicalis* and *C.dubliniensis* were the most frequently isolated strains.⁽¹¹⁾ Majority of studies from different parts of the world report *Candida Albicans* still most frequent pathogen isolated and the prevalence ranges from 40-77%⁽¹²⁻¹⁴⁾. But epidemiological studies show that there is a gradual shift in the prevalence of NAC species is about 10% from 1970s and up to 20% in 1980s. And recent study in 2018 from Nepal shows the prevalence of NAC of 33%.⁽¹⁵⁾

There are reports of increased resistance to commonly used anti-fungal agents like fluconazole with recurrence of VVC frequently. Most literatures are reporting resistance of NAC species to commonly used antifungals. In recent years many clinicians and microbiologists from different parts of the world have looked into and tried to study in detail regarding different species of candida as the causative of vulvo vaginal candidiasis in women. Sachin C Deodukar in their study from Maharashtra, India have reported that 36.7% of the isolates were *Candida albicans* and the rest 63.3% were NAC strains⁽¹⁶⁾ In their study

of NAC, *Candida tropicalis* (35.1%) was the most frequent followed by *C.Glabrata* (28.1%) and *C.Krusei* (16.3%) And the strains of *Candida albicans* showed resistance to ketoconazole in 41.7%, and 33-40% cases showed resistance to other Azoles (*Fluconazole* and *Itraconazole*). But examining cases of NAC drug resistance to standard antifungals were higher among them with 64.5% of *Candida glabrata* and 42% of *C.tropicalis* being resistant to the most commonly used Azole-ketoconazole. Similar reports are also found by works of Richter, Nyirjesy, and Ray D^(7,17,18)

Maitrayee Sen et al reported from Chennai reported a higher prevalence of NAC species compared to *Candida Albicans* strain (63% vs 37%)(19). Drug sensitivity to standard anti fungals showed resistance to Clotrimazole in 1%, miconazole 4%, and 10% showing resistance to ketoconazole. This data showed that though there is a shift in the species of candida to Non-*Albicans Candida* species, drug resistance is not a major problem in *Candida Albicans* as well as NAC species isolated from Chennai.

In the present study done among 400 cases of vulvovaginitis, 65 cases (16%) were positive for *Candida* species. Among the positive cultures, 46.2% were *C Albicans* followed NAC species in 53.8% cases (*C.Tropicalis* (24.6%), *C .Glabrata* (16.9%) and *C.Parasilosis* (12.3%)). And our data showed that drug resistance to antifungals was present in 10% of *Candida Albicans* species only. Significant drug resistance was not present among strains isolated from Thiruvananthapuram which is an information relieving to the treating physician.

Conclusion

Among the antenatal women with vulvovaginal candidiasis, Non *albicans Candida* was a predominant strain and the strains were sensitive to standard antifungals used. Drug resistance was not a major problem among the species isolated in our institute.

Conflicts of Interest: None

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