PREVALENCE OF VULVOVAGINAL CANDIDIASIS IN SEXUALLY ACTIVE FEMALES WITH ANTIFUNGAL SUSCEPTIBILITY PATTERNS OF THE ISOLATES

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ABSTRACT

Introduction: Vulvovaginal candidiasis (VVC) is the most common fungal infection of lower genital tract of females. It is an important cause of morbidity in young women due to its increasing incidence and is considered as an important public health problem worldwide. In recent years there has been a change in the trend of infections caused by non-albicans Candida species and anti-fungal susceptibility patterns. This study was carried out to assess the prevalence, potential risk factors and detect the antifungal susceptibilities of the isolates. **Methods:** A prospective study was conducted in a tertiary health centre of southern Odisha from January 2016 to December 2017and included 240 clinically diagnosed cases of VVC in the reproductive age group presenting with curdy white discharge with or without pruritus, burning, or dysuria. After getting an informed consent and brief history, vaginal swabs were collected and microscopic examination, culture and antifungal susceptibility were done. **Results:** Most common age group affected by VVC belonged to 26-35 years and majority of the cases were from rural areas. A total of 87 Candida species (36.3%) and, 4 *Trichosporon asahii* were isolated. *Candida albicans* was the most common isolate (52), followed by *Candida glabrata.* Most of the isolates were sensitive to clotrimazole (90.1%) followed by fluconazole (83.5%). **Conclusion:** The prevalence of VVC in our study was found to be 36.3%. Low socioeconomic status, low education, oral contraceptive pill users and Diabetes were the common predisposing factors. The most common agent causing VVC was *Candidia albicans* followed by *Candida glabrata*. Most of the yeasts isolated were sensitive to Clotrimazole followed by fluconazole.

KEYWORDS: Candida; Vulvovaginal candidiasis; Antifungal susceptibility.

INTRODUCTION

Vulvovaginal candidiasis is the most common fungal infection affecting 75% of sexually active women and causing significant morbidity, healthcare cost, sexual dysfunction, discomfort and pain [1,2]. VVC is caused by *Candida*, a saprophytic yeast causing opportunistic infection in conditions when there is decrease in vaginal pH or conditions predisposing to alteration of local defence mechanisms like pregnancy, diabetes mellitus, malnutrition, contraceptives, tight fitting and synthetic inner wears, poor menstrual hygiene and patients on immunosuppressive drugs [3]. VVC if not treated may lead to infertility due to pelvic inflammatory disease in young women and chorioamnionitis followed by abortion andprematurity in pregnant women [4]. Candidial vulvovaginitis is mainly due to *C. albicans* but more recently non-albicans *Candida* species are increasingly being reported as well as yeasts belonging to other genera. There have been reports of variable resistance to antifungal agents by non-albicans *Candida* making treatment a serious clinical challenge [5]. To avoid spread of resistance of Candida species by injudicious use of topical and systemic antifungals, identification of the Candida isolates and antifungal susceptibility testing of the routine samples is essential. The present study was aimed to determine the prevalence, potential risk factors, predisposing conditions and antifungal susceptibility pattern of the Candida isolates in sexually active female in this region.

DOI: 10.5455/ijcbr.2018.42.09

eISSN: 2395-0471
pISSN: 2521-0394

MATERIALS AND METHODS

Study design: An observational study

Ethics approval: Study was approved by Institutional Ethics Committee and **w**ritten informed consent were taken from all the patients prior to sample collection.

Study location: The present study was carried out in the department of Microbiology

Study period: January 2016 to December 2017

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Sample size: The study group included 240

Inclusion criteria: Sexually active women between 18 to 45 years who presented with vaginal discharge and / or itching/burning, dysuria or low abdominal pain.

Exclusion criteria: Patient with pregnancy, on antimicrobial therapy, menstruating, undergone hysterectomy, carcinoma cervix, uterine fibroids and prolapsed uterus were excluded from the study.

Methodology: A detailed history of each patient with respect to age, occupation, socioeconomic status, marital status, personal hygiene, contraceptive practices, sexual behaviour, past and present history of sexually transmitted infections and high risk behaviour of their partners were recorded in form of semi-structured questionnaires.

Two sterile cotton swabs were used to collect samples from the lateral wall of the vagina. Wet mount microscopy and gram staining was done from one of the swabs and the other swab was used for culture on Sabouraud's Dextrose Agar (Hi-Media, Mumbai, India) supplemented with 0.06mg/ml gentamicin. The isolates were identified based on morphology, germ tube production, chlamydospore formation on cornmeal agar (Hi-Media, Mumbai, India), sugar assimilation and fermentation tests and growth on CHROM agar Candida (Hi-Media, Mumbai, India).

Antifungal susceptibility testing was performed by Kirby Bauer disc diffusion method using commercially available antifungal discs of clotrimazole, fluconazole, itraconazole, ketoconazole and amphotericin B on Antimycotic sensitivity test agar M1336-500G(HI-Media,Mumbai,India). The zones were compared with the zone charts of Hi-Media Laboratories to know the antimicrobial sensitivity pattern.

RESULTS

Most of the patients belonged to the age group of 26 to 35 years (39.1%) followed by 36 to 45 years (34.6%). Majority of the patients were from rural areas (61.7%). [Table 1]. VVC was more prevalent among women with low education (illiterate-5.4% and up to primary school 47.1%), daily labourers (38.7%) and oral contraceptive pill users (38.3%).[Table 2, 3 and4]. Out of the 240 clinically diagnosed cases of VVC, 87 cases of *Candida* species were isolated. *Candida albicans* (57.1%) was the most common isolate followed by *Candida glabrata* (25.3%), *Candida tropicalis* (7.7%), and *Candida parasilosis* (5.5%). From four patients *Trichosporon asahii* (4.4%) were isolated. [Table.5] Most of the isolates were sensitive to clotrimazole (90.1%) followed by fluconazole (83.5%). Most of the yeast isolates were resistant to ketoconazole (31.8%). [Table.6]

Table 1. Demographic details

Age (years)	Cases (%)	Residence	
		Urban	Rural
15-25	63 (26.3)	18	43
26-35	**94 (39.2)**	41	59
36-45	83 (34.6)	33	46
Total	240 (100)	92 (38.3%)	**148 (61.7%)**

Table 2. Educational status (n=240)

Education	Cases (%)
Illiterate	13 (5.4)
Primary school	**113 (47.1)**
High school	65 (27.1)
Higher secondary school	31 (12.9)
Degree	18 (7.5)

Table 3. Occupation (n=240)

Occupation	Cases (%)
Service Holders	21 (8.8)
Business	13 (5.4)
Daily wage worker	**93 (38.7)**
Housewife	72 (30)
Student	41 (17.1)

Table 4. Predisposing factor (n=240)

Predisposing factors	Cases (%)
Diabetes	79 (32.9)
OCP	**92 (38.3)**
HIV	32 (13.3)
Steroid therapy	21 (8.8)
Malignancy	16 (6.7)

Table 5. Distribution of Yeasts isolated from vaginal discharge (n=91)

Yeasts isolated	Number	%
Candida spp. :		
Candida albicans	52	57.1%
Candida glabrata	23	25.3%
Candida tropicalis	7	7.7%
Candida parasilopsis	5	5.5%
Trichosoporon asahii	4	4.4%
Total	91	100%

Table 6. Antifungal susceptibility test (n=91)

Yeast isolated	Number	Clotrimazole (10mcg)		Itraconazole (30mcg)		Fluconazole (10mcg)		Ketoconazole (10mcg)		Amphotericin B (100units)	
		S	R	S	R	S	R	S	R	S	R
C. albicans	52	49	3	42	10	48	4	40	12	41	11
C. glabrata	23	18	5	15	8	16	7	12	11	15	8
C. tropicalis	7	6	1	5	2	5	2	4	3	4	3
C. parasilopsis	5	5	0	3	2	4	1	3	2	5	0
T. asahii	4	4	0	3	1	3	1	3	1	4	0
Total	91	82	9	68	23	76	15	62	29	69	22

S-sensitive, R-resistance

DISCUSSION

VVC is a common infection with 50-72% of all women having at least one episode of vaginal candidiasis in their life time and 40-50% of them having recurrent episodes. In our study the highest frequency of VVC was seen in the age group of 26-35 years (39.2%) followed by 36-45 years (34.6%).This may be due to maximum sexual and reproductive activity in these age groups.The prevalence of clinically diagnosed cases of VVC was more in rural areas (61.7%) compared to urban areas (38.3%). Similar observation was reported by *Rati et al* with a highest frequency of vaginal candidiasis in the age group of 26-35yrs [6]. Vulvovaginal candidiasis was more prevalent among women with low education (47.1%), low socioeconomic status (38.7%) and those using OCP(38.3%). Non-usage of sanitary toilet, use of homemade napkins during menstruation, poor personal hygiene, low level of literacy, and poor knowledge of reproductive health, limited exposure to mass media and inaccessibility to health care services were the contributory factors leading to VVC. High estrogen Oral contraceptive pills alters the normal bacterial flora, predisposing to vaginal cololonisation by *Candida*, a similar mechanism seen in pregnancy [7]. In this study *Candida albicans* (57.1%) were isolated followed by *Candida glabrata* (25.3%),*Candida tropicalis* (7.7%),*Candida parasilopsis* (5.5%).This study is in accordance to *Mahmoudabadi AZ et al*, in which *Candida albicans* was the most common species isolated followed by *Candida glabrata* [2]. Study conducted by *Jackson et al* in West Indies also had similar findings [8]. This study was contrary to a study conducted by *Mohanty et al* in which *Candida glabrata* was the most common species among the isolates followed by *Candida albicans* [9]. *Varsha et al* in their study showed an increasing prevalence of non albicans *Candida* species among vulvovaginitis cases in child bearing age group women [10]. In antifungal susceptibility testing, most fungal isolates were sensitive to clotrimazole (90.1%) followed by fluconazole (83.5%). A study conducted by *Jithendra et al* found that all fungal isolates were 100% sensitive to voriconazole and some degree of resistance to fluconazole [11]. *Mahmoudabadi et al* in his study revealed that none of the Candida isolates tested were resistant to clotrimazole, miconazole and nystatin whereas, in our study we found *Candida albicans* was resistant to ketoconazole in 12 isolates, amphotericin B in 11 isolates and itraconazole in 10 isolates[2].

CONCLUSION

The prevalence of VVC in our study was 36.3%.Though in our study *C. albicans* was the predominate isolate, non albicans *Candida* and *Trichosporon asahii* were also isolated. Resistance to azoles is emerging among yeasts which necessitates the isolation, identification and antifungal susceptibility testing in cases of VVC routinely to prevent spread of resistance.

Suggestions: VVC in sexually active females in the reproductive age group may lead to infertility and other complications. Education about sexual health and hygiene in young females is necessary as this was the most common age group affected.

Conflict of interest: None declared by author

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How to Cite this article: Subhalaxmi Sahoo, Indrani Mohanty, Banojini Parida, Satyadarsi Patnaik. Prevalence of vulvovaginal candidiasis in sexually active females with antifungal susceptibility patterns of the isolates. *Int. j. clin. biomed. res.* 2018;4(2):38-41.