Original Research Article

Prevalence of vulvovaginal candidiasis in symptomatic women of reproductive age group (15-45 years) attending tertiary care institute

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Abstract

Background: Vulvovaginal candidiasis is a commonly reported gynecological condition. It is a major cause of mental distress and economic costs in women of reproductive age group. **Aim:** To determine the prevalence of vulvovaginal candidiasis in symptomatic women of reproductive age group. **Material and Methods:** A total number of 184 women aged 15-45 years, attending obstetrics and gynecology out-patient department were included in the present study. A detailed clinical history was taken from the patients regarding age, use of contraception, associated comorbid conditions. Two high vaginal swabs were collected from posterior vaginal wall with aseptic precautions and sent to Microbiology department for further processing. **Results:** The prevalence of VVC in the present study was 22.8%. Amongst various age groups, 26-30yr (40%) followed by 31-35yr (22.6%) and 21-25yr (16.7%) showed higher percent of Candida positive cases. PID 12 (28.6%) was most commonly associated followed by cases having previous episode of vaginitis 4 (9.5%).OC Pill 9 (21.4%) was most commonly used contraceptive followed by Condom 8 (19.1%). **Conclusion:** A prevalence of 22.8% of vaginal candidiasis was found in women of reproductive age group of 15-45 years in the present study. Candida species can cause infection at any point in the reproductive life leading to genital discomfort and is a major reason for frequent hospital visits.

Key Word: Vulvovaginal candidiasis, reproductive age group, Candida species, prevalence, risk factors

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INTRODUCTION

Vulvovaginal candidiasis (VVC), fungal or yeast infection by Candida species, is a commonly reported gynecological condition and is diagnosed in a large proportion of women presenting to medical facilities with a complaint of abnormal vaginal discharge.[1] Candida species are part of the lower genital tract flora in 20%–50% of healthy asymptomatic women.[2]They are normal flora of the vagina that eventually become pathogenic under some prevailing conditions, and thus presents as a common etiology of vulvovaginitis. While not a cause of mortality, the morbidity associated with vulvovaginal candidiasis makes it a major cause of mental distress and economic costs. The literature describing the epidemiologic and clinical features of vulvovaginal candidiasis commonly reports that approximately 75% of women will experience an episode of vulvovaginal candidiasis in their lifetimes, 50% of initially infected women will experience at least a second episode, and 5-10% of all women experience recurrent vulvovaginal candidiasis (RVVC).[3,4] The present study was conducted to determine the prevalence of vulvovaginal candidiasis in symptomatic women of reproductive age group (15-45 years) to find out its distribution in different age group and risk factors associated with it.

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MATERIAL AND METHODS

The present prospective cross sectional study was carried out at a tertiary care hospital for a period of one and a half year and included 184 subjects. The study commenced after Institutional Ethics Committee approval.

Sample size: Sample size was calculated by the Absolute Precision Formula: Sample size (n) = $Z^2\alpha$ X PQ/d^2Where, a) P=prevalence, b) Q=100-P, c) Confidence level=95%, therefore Z = 2, d) Absolute precision required on either side of the proportion (in percentage points) d=10 percentage points i.e. 10% confidence interval.

Inclusion criteria

- Women in 15 to 45 years age group with symptoms of vaginal discharge with or without itching around the vaginal region or erythema or pain.
- Women who were sexually active.

Exclusion criteria

- Women with history of local or systemic antifungal treatment in the past one month.
- Pregnant women with medical disorders.
- Women who have never been sexually active.
- Women currently menstruating.
- History of hysterectomy.

A total number of 184 women aged 15-45 years, attending obstetrics and gynecology out-patient department (OPD) at a tertiary care hospital were included in the present study. The details of the study was explained to the patients enrolled, in their own language. The written consent was taken from each patient. A detailed clinical history was taken from the patients regarding age, use of contraception, associated comorbid conditions like diabetes, infertility, pelvic inflammatory disease and previous history. Following clinical examination, two high vaginal swabs were collected from posterior vaginal wall with aseptic precautions and sent to Microbiology department for further processing.

RESULTS

Out of the total 184 high vaginal swab specimens, Candida species was isolated in 42 cases (22.8%) while in the rest 142 (77.2%) specimens no fungal growth was seen. Thus the prevalence of VVC in the present study was 22.8%.

Table 1: Prevalence of vulvovaginal candidiasis

Findings on SDA	No. of cases	Percentage (%)
Growth	42	22.8
No growth	142	77.2
Total	184	100

All the cases studied were divided into various age groups. Majority of the cases were in age group of 31-35yr (45.2%), followed by 26-30yr (38.1%). This was found to be statistically significant. Mean age of the VVC cases was 31.71±3.73yr and median age was 31yr. The age range was 23-41yr. The youngest patient in the study was aged 23 years and the oldest was 41 years

Table 2: Correlation of different age group with growth of Candida species

Age group		Diagnosis		Total	Test	P value
		Growth of Candida	No growth of Candida			
21-25yr	Count	2	10	12	Fischer's Exact test value: 13.257	0.006*
	%	16.7%	83.3%	100%		
26-30yr	Count	16	24	40		
	%	40%	60%	100%		
31-35yr	Count	19	65	84		
	%	22.6%	77.4%	100%		
36-40yr	Count	4	42	46		
	%	8.7%	91.3%	100%		
41-45yr	Count	1	1	2		
	%	50%	50%	100%		
Total	Count	42	142	184		
	%	22.8%	77.2%	100%		
Mean age in years		31.71±3.73	33.13 ±4.26	32.81 ±4.18	T= 3.797	0.053

Cases were divided based on age. Candida positive and negative cases were compared in various age-groups. Amongst various age groups, 26-30yr (40%) followed by 31-35yr (22.6%) and 21-25yr (16.7%) showed higher percent of Candida

positive cases as compared to other age groups. This variation seen in culture positive cases over different age groups was found to be statistically significant. Mean ages of Candida positive and negative cases were compared. This was not found to be statistically significant.

Table 3: Distribution of cases based on presenting complaints

Presenting complaints	No. of cases	Percentage (%)
Only Discharge	18	42.9
Discharge and Itching	9	21.4
Discharge andRedness	8	19
Discharge andRednessandItching	7	16.7
Total	42	100

Chi square value: 7.333; P value: 0.062

All the cases studied were divided into various groups based on presenting complaints. Cases having complaint of only vaginal discharge was present in 18 cases (42.9%), followed by those complaining of discharge and itching 9 (21.4%), discharge with redness 8 (19%) and redness, itching and discharge 7 (16.7%). This distribution of presenting complaints was not found to be statistically significant.

Table 4: Distribution of cases based on co-morbid risk factors

Co-morbid risk factors		No. of cases	Percentage (%)
Yes (40, 21.7%)	Diabetes	1	2.4
	Infertility	1	2.4
	Previous vaginitis	4	9.5
	PID	12	28.6
No		24	57.1
Total		42	100

Chi square value: 28.476; P value: <0.001*

All the cases studied were divided into various groups based on presence of other associated conditions. PID 12 (28.6%) was most commonly associated followed by cases having previous episode of vaginitis 4 (9.5%). Significantly higher percent of cases did not have any associated co-morbid conditions.

Table 5: Distribution of cases based on use of contraception

Use of contraception		No. of cases	Percentage (%)
Yes (20, 47.6%)	Condom	8	19.1
	OC Pill	9	21.4
	IUD	3	7.1
No		22	52.4
Total		42	100

Chi square value: 18.762; P value: <0.001*

All the culture positive cases studied were divided into various groups based on use of contraception. OC Pill 9 (21.4%) was most commonly used contraceptive followed by Condom 8 (19.1%). Significantly lower percent of VVC cases used contraception.

DISCUSSION

Vulvovaginal candidiasis (VVC) is a common gynecological finding in women worldwide.[5] 75% of the sexually active women have been found to have symptomatic vaginal candidiasis at least once in their life and 40-50% will have recurrent episodes during their lifetime.[6-9] In spite of several treatment modalities and application of new effective drugs, VVC is a complex and considerable problem in gynecology and obstetrics.[10] In present study, Candida species was isolated in 42 cases (22.8%), out of the total 184 women. In the rest 142 (77.2%) specimens no fungal growth was seen. Thus the prevalence of VVC in the present study was 22.8. Kalaiarasan *et al* study,[11] Jindal *et al* study[12] and Raghunathan *et al*[13] study reported a prevalence of 23.7%, 23% and 22.2% respectively which is comparable to the present study. Vijaya *et al*[14] reported a prevalence of 17.7% in a study conducted in Karnataka on 300 women which is lower than the present study whereas Oviasogie *et al* study[15] reported a prevalence of 44.8% in a study done at Nigeria. The prevalence of 22.8% in the present study is comparable to most of other studies[11-13] except in the study done by Oviasogie *et al* in Nigeria[15] where a higher prevalence of 44.8% is seen. The high

prevalence might be due to the study group which consisted of only pregnant women. Increased incidence of vaginal candidiasis seen in pregnant women might be due to increased levels of progesterone and estrogen. Progesterone reduces the anti-Candida activity of neutrophils while estrogen has been found to suppress the ability of vaginal epithelial cells to inhibit the growth of Candida.[4] All the patients were women in reproductive age group, in the present study. Their age ranged from 22 to 45 years. The youngest case was 22 years old and the oldest was 45 years old. Majority of the cases 84/184 (45.7%) were in the age group of 31 to 35 years. Least number of cases 2/184 (1.1%) were seen in age group of 41 to 45 years. The mean age of the study patients was 32.81±4.18 years whereas the mean age of the culture positive cases was 31.71±3.73 years. Majority of culture positive cases 19/42 (45.2%) were in age group of 31-35 years. This was found to be statistically significant. In the study conducted by Kalaiarasan *et al*,[11]in Puducherry, on fungal profile of vulvovaginal candidiasis, the mean age of the 211 women enrolled was 33.4±8.7 year whereas, the mean age of 50 culture confirmed cases of VVC was 33.1±7.9 years which was in concordance with the present study. In the same study, among the 50 culture confirmed cases, 22 (44%) patients were in age group of 21-30 years followed by 19 (38%) patients in age group of 31-40 years and least number of patients 9 (18%) were in age group of 41-50 years. In this study maximum cases 48.5% were found in age group of 20-29 years. In a study by Raghunathan *et al*[13] conducted at Puducherry on 180 patients, 40 (22.2%) were culture confirmed cases. Maximum number of patients 82/180 (45.5%) were seen in age group of 26 to 35 years which was similar to the present study. In Oviasogie *et al*[15] study conducted in Nigeria on 87 patients, out of 39 (44.8%) confirmed cases, maximum number of cases 20 (51.2%) were in age group of 24 to 30 years while in present study majority of VVC cases 45.2% were seen in age group of 31-35 years. Studies done by various authors including the present study conclude that the incidence of reproductive tract infections in women is highest in the age group of 20-35 years followed by a decline. The reason for high incidence in this age group includes low levels of protective cervical antibodies, increased sexual activity, and influence of reproductive hormones that may lead to increased susceptibility to reproductive tract infections.[16] Postmenopausal women seems to be more resistant to Candida colonization, although it has been observed that the incidence of VVC rises among women on hormone replacement therapy. The prevalence of asymptomatic Candida infection declines with increasing age. This reduction in prevalence of Candida infection in postmenopausal women could be due to decreased levels of reproductive hormones. High levels of reproductive hormones are generally thought to provide a better medium for growth of Candida by inducing higher glycogen contents in the vaginal epithelial cells and some studies also say that estrogens have a direct effect on the growth of Candida and its attachment to the vaginal epithelium.[16] On studying the distribution of co-morbid risk factors in cases of VVC, the present study revealed that 12/42 (28.6%) of the culture positive cases were associated with pelvic inflammatory disease (PID) while 1/42 (2.4%) each were associated with infertility and diabetes. Findings similar to the present study was reported in the Kalaiarasan *et al* study,[11] where PID was associated with 32% of 50 culture positives, whereas infertility and diabetes, each were associated in 2% of culture positive cases. The study conducted by Raghunathan *et al*[13]in Puducherry reported that 15% of the 40 culture positives were related to diabetes mellitus. The positivity of diabetes as co morbid condition in respect with VVC was seen to be higher in this study as compared to the present study. In the present study, when various co -morbid risk factors were correlated with growth of Candida species, it was observed that highest positivity was seen in diabetes (50%) followed by PID (48%), previous vaginitis (40%) and infertility (33.3%). Many investigators have suggested that vulvovaginal candidiasis (VVC) occur more frequently in diabetics and that diabetes may be a marker of chronic recurring VVC.[17,18] It has been proposed that elevated levels of glucose predispose to VVC by impairing basic mechanisms of host defense and by promoting Candida adhesion to vaginal cells. Studies in vitro have shown that vaginal epithelial cells from diabetic women have an enhanced capacity to bind to *C. albicans* than vaginal cells from non-diabetic patients.[17,18] In the present study, various contraceptive methods were used by 20/42 (47.6%), of the culture positive women. Among those, who used various contraceptive methods, the most common was Oral Contraceptive (OC) pills 9/42 (21.4%) followed by condom 8/42 (19.1%) and intra uterine devices 3/42 (7.1%). No contraceptives were used by the remaining 22/42 (52.4%) of the culture positive women. Study by Jindal *et al*[12] in Amritsar on 400 patients, reported that 36.8% of 92 culture positives women used oral contraceptive pills which is higher than that of present study. Whereas study done by Raghunathan *et al*[13]on 180 women showed positivity of only 7.5% in OCP users which is lower than that of present study. Use of contraceptive pills has been reported to increase the occurrence of vaginal candidial infection.[19] This might be due to similarity between the mechanism operating in pregnancy and high estrogen OC Pills which increases vaginal colonization of Candida.[12] Estrogen has been

found to reduce the ability of vaginal epithelial cells to inhibit the growth of Candida and hence increase in vaginal colonization of Candida species.[19] The cases were divided based on use of contraceptives and each group was compared with Candida positive and negative cases. Candida positivity was found to be highest for the group using IUD (42.9%) followed by those using OC pills (27.3%) and condom (20.5%). It has been suggested that the association of IUD use with VVC episodes is due to the Candida adhesion and biofilm formation on the surface of the device.[17]

CONCLUSION

A prevalence of 22.8% of vaginal candidiasis was found in women of reproductive age group of 15-45 years in the present study. Candida species can cause infection at any point in the reproductive life leading to genital discomfort and is a major reason for frequent hospital visits.

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