RESEARCH PAPER

Prevalence of vulvovaginal candidiasis in the 18- to 55-year age group in a semi-urban area in North India

Dr. Sumita Bhatia[1*], Snr. Assoc. Prof. Dr. G. Prabhakaran[2], Snr. Assoc. Prof. Dr. S. Parasuraman[3], Dr. Neeraj Kumar[4], Dr. Madhumita Sen[5], Prof. Dr. Thiyagar Nadarajaw[6]

Faculty of Medicine, AIMST University, Malaysia, Email: bhatiadrsumita@gmail.com
Faculty of Applied Sciences, AIMST University, Malaysia, Email: parabhakaran@aimst.edu.my
Faculty of Pharmacy, AIMST University, Malaysia, Email: parasuraman@aimst.edu.my
General Manager, Clinical Operations, Datt Medi Products, Delhi, Email: dr.neekumar@gmail.com
Faculty of Medicine, AIMST University, Malaysia, Email: Madhumitasen@aimst.edu.my
Faculty of Medicine, AIMST University, Malaysia, Email: thiyagar@aimst.edu.my

Corresponding Author
Dr. Sumita Bhatia
Faculty of Medicine, AIMST University, Malaysia, bhatiadrsumita@gmail.com

ABSTRACT

Background: Females in the reproductive age group are frequently infected with vulvovaginal candidiasis (VVC). The current study's goal is to ascertain the prevalence, distribution, and risk factor associations of vulvovaginal candidiasis in females in the reproductive age range from 18 years to 55 years who visited in medical camps organized by a Private Hospital located in a semi-urban population in Lucknow, Uttar Pradesh, India

Objective: The study aimed to determine the prevalence of vaginal candidiasis in the reproductive age group and its associated risk factors.

Methods: This was a cross-sectional descriptive study conducted over one month. Patients who came to medical camps with complaints of vaginal discharge and itching in the 18 – 55 years age group were included in this study.

Patient characteristics, i.e., age, parity, risk factors like diabetes, pregnancy, use of oral contraceptive pills, and intrauterine contraceptive device (IUCD) were noted. High vaginal swabs (HVS) were collected and sent for Microscopic examination and culture. Candida-positive cases were noted, and results were analyzed.

Results: A total of 384 high vaginal swabs were collected. Prevalence of vulvovaginal candidiasis was found to be 30.98 %. It was higher in the 36-55-year age group and among multiparous women. Previous history of candidiasis (RVVC), diabetes, and IUCD were the most common risk factors. C. albicans was more frequent (76.47%) than non-albicans *Candida* (23.52%).

Conclusions: This study concluded that vulvovaginal candidiasis is more prevalent in reproductive-age females; therefore, a routine high vaginal swab culture must be performed in every woman presenting with vaginal discharge and itching for early diagnosis. Every woman should be educated on clinical symptoms.

Keywords: : High vaginal swab (HVS), Intrauterine contraceptive device (IUCD), Oral contraceptive pills (OC pills),

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INTRODUCTION

Vaginal discharge is the most common reproductive tract infection in gynecological patients. In symptoms there is abnormal discharge with an altered
color, amount, associated with itching/mal odor, which is caused by an imbalance in the normal vaginal flora (Rautemaa-Richardson et al., 2026).

Vulvovaginal candidiasis refers to a disorder characterized by signs and symptoms of vulvovaginal inflammation in the presence of Candida species. It is the second most common cause of vaginitis symptoms (after bacterial vaginosis) and accounts for approximately one third of vaginitis cases (Bashir et al., 2023).

Candida spp. are part of the lower genital tract flora in 20%-50% of healthy
asymptomatic women. It occurs in 1-14% of all women of reproductive age throughout the world. An estimated 75% of women will experience at least one episode of vulvovaginal candidiasis during their lifetime. Vulvovaginal candidiasis is an important cause of
morbidity in pregnancy, which can cause abortion, *Candida* chorioamnionitis, and subsequent preterm delivery. It has been associated with considerable direct and indirect
economic, social and psychological costs to the women. Vulvovaginal candidiasis is caused by overgrowth of Candida yeast species in the vagina and is characterized by curd-like vaginal discharge, itching and other symptoms (Rawat et al., 2023).

Candida albicans has been documented to be the major cause of VVC, but the proportion of non-albicans Candida species appears to be increasing in last few decades (Akinosoglou et al., 2024). Pinpointing vulvovaginal candidiasis (VVC) solely on what the patient reports and sometimes physical exam is unreliable. This is because the symptoms and physical signs aren't specific enough to VVC, as other conditions

can cause similar issues, such as abnormal vaginal discharge (leukorrhea) and itching (pruritus vulvae) (Mitchell et al., 2024). Therefore, definitive diagnosis of VVC requires culture isolation and identification of Candida spp.

OBJECTIVES

The objective of the present study is to determine the prevalence of vulvovaginal candidiasis among pregnant and non-pregnant women aged 18 to 55 attending our medical camps, and to identify its distribution across age groups and associated risk factors. It helps us to understand the magnitude of the problem in our region and to implement the necessary treatment modalities.

METHODS

This cross-sectional descriptive study was conducted over one month, from 1st March 2026 to 31st March 2026. The study population was selected from the patients who were attending the medical camp organized by the private hospital in a semi-urban area of Lucknow, Uttar Pradesh, India

The study was conducted on a total number of patients aged between 18 to 55 years after informed verbal consent, who came to our medical camp with complaints of vaginal discharge and itching. The purpose of the present study was to determine the prevalence of vulvovaginal candidiasis, its distribution, and association with risk factors in our region. After verbally giving their informed consent, 384 patients in the reproductive age range of 18 to 55 years who complained of vaginal discharge and itching were included in the study. This study aimed to determine the distribution, prevalence, and association between risk factors and vulvovaginal candidiasis in our area.

INCLUSION CRITERIA

- All women in the age group 18 to 55 years.
- Willing to participate in the study.

EXCLUSION CRITERIA

- Unmarried women
- Subjects having pelvic surgery

A detailed clinical history was taken from the patients, including age, parity, symptoms of vaginal discharge, itching, and risk factors like diabetes, pregnancy, use of oral contraceptive pill
(OC pill), Intrauterine copper device (IUCD), and previous history of candidiasis.

Following a complete general examination, a per-abdomen and pelvic examination was performed. For the diagnosis of vulvovaginal candidiasis, a high vaginal swab (HVS) was taken under sterile precautions, labeled, and sent to the laboratory for microscopy and culture. In *Candida*-positive cultures, *Candida albicans* or non-albicans species (*C. glabrata, C. tropicalis, C. krusei and C. parapsilosis*) were differentiated and recorded. The results were statistically analyzed to determine prevalence and other factors.

RESULTS

A total of 384 high vaginal swabs were collected and reported in the present study. HVS were analyzed for both *Candida albicans* and non-albicans *Candida*. Among them, 30.98% (119/384) swabs were positive for *Candida* growth on culture and 69.02 % (265/384) were negative for Candida growth. So, the prevalence of vulvovaginal candidiasis was found to be 30.98 %

Table 1: Prevalence of Vulvovaginal candidiasis in females

Culture	No. of Patients	Percentage
Positive	119	30.98
Negative	265	69.02
Total	384	100

Table 2: Distribution of vulvovaginal candidiasis among different age groups.

CANDIDA					
Age Group (in Years)		Positive	Negative	Total	Percentage %
	18 - 25	15 (12.60 %)	31 (67.39 %)	46	11.97
	26 - 35	34 (28.57 %)	72 (27.16 %)	106	27.60
	36 - 45	52 (43.69 %)	114 (43.01 %)	166	42.22
	46 - 55	18 (15.12 %)	48 (18.11 %)	66	17.18

We analyzed clinical details of culture-positive patients, and the results are shown below (by age group, parity, and risk factors). The highest number of positive cases was found in the 36 to 45 years age group (42.22%), followed by the 26 to 35 years age group (27.60%). In the present study, VVC incidence was higher in the reproductive age group and lower in the 18 to 25 and 44 to 55 years age groups.

Table 3: Distribution of vulvovaginal candidiasis is based on parity

PARITY	No. with candida positive n 119	Total HVS SDA Culture N 384
Nulliparous	14 (11.76 %)	35 (9.11 %)
Para 1	48 (40.33 %)	140 (6.45 %)
Para 2	29 (24.36 %)	120 (31.25 %)
More than 2	28 (23.52 %)	89 (23.17 %)

Prevalence of vulvovaginal candidiasis was found to be high in women who had a parity of 1 (40%) and lower in nulliparous (25.4%).

Table 4 Distribution of Clinical Symptoms

Symptoms	Prevalence (n 119)
Itching	79 (66.38 %)
Burning	64 (53.78 %)
Discharge	59 (49.57 %)
Vulvar Redness & Swelling	35 (29.41 %)
Dysuria	18 (15.12 %)
Dyspareunia	27 (22.68 %)
Soreness	41 (34.45 %)

The most common symptom was found to be vaginal itching. Burning and discharge were other common symptoms.

Table 5 Association between VVC and risk factors.

Risk Factors	Candida positive (n 119)	Total no. cultures (n 384)
OC Pill	35 (29.41 %)	6 (1.56 %)
IUCD	42 (35.29 %)	4 (1.04 %)
Pregnancy	24 (20.16 %)	32 (8.33 %)
Diabetes	58 (48.73 %)	15 (3.90 %)
H/O RVVC	72 (60.50 %)	7 (1.82 %)
None	19 (15.96 %)	76 (19.76 %)

Previous candidiasis was the most common risk factor associated with RVVC prevalence (60.50 %) in this study, followed by diabetes (48.73 %), IUCD (35.29 %), OC Pill (29.41 %) and pregnancy (20.16 %)

Table 6 Association of observed clinical signs and diagnosis (positive predictive value) of vulvovaginal candidiasis

Clinical Examination	Lab Diagnosis	% diagnosed with VVC
62	54	87 %

The positive predictive values of these signs for predicting vulvovaginal candidiasis were high.

Table 7 Prevalence of C. albicans and non albicans candida

Species	Non Pregnant	Pregnant	Total
Candida albicans	84	7	91 (76.47%)
Non albicans Candida	26	2	28 (23.53%)
Total	110	9	119 (100 %)

Among the *Candida*-positive cultures, C. albicans was the predominant species in both pregnant and non-pregnant patients (76.47 %) followed by non-albicans *Candida* (23.53 %

Table 8 Frequency distribution of *Candida* species in *Candida*-positive culture patients

Candida species	Number of patients (n 119)	Percentage
C. albicans	74	62.18 %
C. glabrata	16	13.44 %
C. tropicalis	18	15.12 %
C. krusei	2	1.68 %
C. parapsilosis	9	7.50 %

Candida tropicalis was found to be the most prevalent species among non-albicans *Candida* (NAC)

DISCUSSION

It's difficult to determine the true prevalence of vulvovaginal candidiasis (VVC) because diagnoses are often based on symptoms alone, not lab tests. This means that many women may be misdiagnosed with VVC when they actually have a different condition.

The current study found that 30.98 % of participants had VVC, which aligns with another study by Kalia N et al.

Other studies have reported VVC prevalence rates ranging from 18.5% to 25%. However, the current study's rate is lower than a study in North-West Nigeria, where 84.5% of participants had VVC. This high rate in Nigeria is likely due to factors like poverty, poor hygiene, lack of education, and the region's ethnic makeup.

Vulvovaginal candidiasis (VVC) is a common yeast infection affecting the vagina and vulva. It's hard to pinpoint the exact number of cases because diagnoses often rely on symptoms alone, without lab tests. This means some women might be misdiagnosed with VVC when they have a different condition.

The current study found that 30.98 % of participants had VVC, similar to another study. Previous research has shown VVC rates ranging from 18.5% to 25%. However, these numbers are much lower than the 84.5% found in a study conducted in North-West Nigeria. This high rate is likely linked to factors like poverty, poor hygiene, lack of education, and the region's specific ethnic makeup.

The study found that 40.33 % of women who were Para 1, as compared to nulliparous (11.76%), tested positive for *Candida*. This difference could be due to multiparous women using contraceptives more often, having more sexual partners, and potentially having poorer hygiene.

The study identified several risk factors for vulvovaginal candidiasis (VVC):

- Prior VVC: The most frequent risk factor, affecting 60.50 % of cases.
- Diabetes: Present in 48.73 % of cases.
- Pregnancy: Linked to 20.16 % of cases.
- Intrauterine device (IUD) use: Associated with 35.29 % of cases.
- Oral contraceptive pill (OCP) use: Linked to 29.41% of cases.

The study further noted a relative increase in non-*Candida albicans* (NAC) (23.53%) as compared to previous studies

FINAL RESULTS

The current study found that women in the reproductive age group are more likely to have vulvovaginal candidiasis. Given the strong correlation found between risk factors such as diabetes, prior candidiasis, use of contraceptives, and pregnancy, routine HVS is necessary for accurate diagnosis and treatment of all patients, including those who are pregnant. All women should receive the proper care in order to avoid VVC-related complications.

In order to address the issue of vulvovaginal candidiasis, all women should receive education regarding its symptoms and personal hygiene.

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The study received ethical approval from the Independent Ethics Committee, Lucknow

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