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Prevalence of vulvovaginal candidiasis in the women of the reproductive age, in rural India

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Abstract
Background: One of the normal commensal the vagina is Candida species, which under certain privileged condition become pathological. Majority of the women present to the gynecology OPD with complains of white discharge, on failure of recognizing the yeast at the appropriate time, leads to frequent hospital visit and lower genital discomfort.
Objective: A cross section study was performed to study the prevalence of vaginal candidiasis in the reproductive age group and the associated risk factors.
Subjects and methods: Women between the age group 18 to 45 visiting the mega health camp was included in the study, 2 swabs one of the high vaginal swab and the other being endocervical swab were. One swab was used to perform the smear with KOH wet mount and gram stain, and the other for inoculation on Sabouraud's dextrose agar and incubated aerobically at 33 °C for 48 hours.
Results: Of the 321 women screened the prevalence was found to be 37.3%, 60% was that of *Candida albicans* and 40% that of non-albicans candidiasis. Vaginal swab with positive Candidiasis was dominant between 21 to 25 age group. 26.6% gives history of hospital visit for the white discharge per vagina and chronic itching a minimum of 2 times. The risk factors and its association with candidiasis was 35 (29.1%) in pregnant women and 7 (5.5%) in diabetics. Bacterial vaginosis was the most common associated infection with candidiasis.
Conclusion: A routine high vaginal swab for smear and culture must be performed for every women presenting with complains of chronic white discharge and itching to rule out fungal infection and prevent use of antifungals. The importance of association of the age with candidiasis strongly indicated the need of sex education for the vulnerable population.

Keywords: Candidiasis, vulva, vaginal, antifungal therapy, culture

Introduction

Vaginal candidiasis (VC) is the most common type of vaginal infection, the patient presents to the gynecologist with complains of chronic odorless curdy white discharge, itching, dysuria, dyspareunia of the lower genital tract [1, 2]. 70-75% of the female population experience vaginal candidiasis at least once in their lifetime and up to 50% of them suffer from recurrent candidacies [3, 4]. Vulvovaginal candidiasis is caused by uncontrolled overgrowth of candida yeast species, *Candida albicans* is seen in approximately 85% of the cases, and the other species are *Candida glabrata*, *Candida krusei*, *Candida tropicalis* and *Candida stellatoidea* [5, 6], women with vaginal candidiasis are more susceptibility to HIV [7]. Multiple studies explains a strong association of candida and diabetes [8, 9, 10] and preterm [11]. Risk factors for VC are pregnancy, uncontrolled diabetes, use of antibiotics, oral contraceptive, immune suppression status, over use of perfume, use of contraceptive [12].

Treatment for VC is very mild, short course. When it is left untreated, it is a potent risk factor for other sexually transmitted disease [13]. Treatment for proven case of VC with a short course of azole based antifungal is effective, safe and affordable [14].

There is no epidemiological data on diagnosed cases of vulvovaginal candidiasis, and hence leads to transition of the condition from a "clinically relevant infection" to a "nuisance infection" [15, 16]. In our country study conducted by Bang *et al*. and Prasad *et al*. are the two popular papers, which studied the prevalence of diagnosed vulvovaginal candidiasis [17, 18], but there was no assessment of the risk factors for the acquiring the infection.

There is a definitive need of study in our population regarding the prevalence of the diagnosed cases of vulvovaginal candidiasis, the associated risk factors and conditions, to prevent the complications and transmission of other STDs.

Material and Methods

We conducted a community based cross sectional study, on all the women residing in kadur taluk. The study was conducted in May 2017, over a period of 7 days. Following a verbal consent of all the women in their reproductive age group who presented with complains of chronic white discharge. We collected basic information like name, age, parity, marital history, potential risk factors in a questionaire. A total of 321 women were examined, who were all sexually active, between the age group 16 to 40 years of whom 120 (37.3%) of them had a positive result.

Following a complete general examination, per abdomen examination and pelvic examination, pervaginal examination was done, the pH was measured and a smear was taken from the posterior fornix. For the diagnosis, the Control and Prevention (CDC) 2006 diagnostic criteria were followed [19]. Laboratory investigations were completed in the Kadar diagnostic. Vaginal swab, KOH mount and gram smear and culture in Isolates Saboraud dextrose agar was performed, based on the color of the inoculate the species was identified i.e *C. albicans* (wet green colonies) . *C. glabrata* (wet dark pink colonies), *C. tropicalis* and *C. dublinensis* (wet blue colonies). Data was analyzed using the SPSS version 20.0.

Results

A total of 321 women were examined 120 women had a diagnosis of vaginal candidiasis. 37.5% of the women were found to be between the ages 21-25 years of age, followed by 19.1% of women between 16-20 years. 51.6% of the women were sexually active for less than 5 years. 10% of the women had an education till degree and 68.3% of the women were employed and most of them were famers by profession.

Table1: Prevalence of vulvovaginal candidiasis by sociodemographic parameters

Age (years)	Patients (number)	Percentage
16-20	23	19.1
21-25	45	37.5
26-30	21	17.6
31-35	12	10
35-40	19	15.8
Sexually active duration (years)		
0-5	62	51.6
6-10	32	26.6
>10	26	21.6
Educational level		
Illiterate	53	44.1
Primary	32	26.6
Secondary	23	19.1
Degree	12	10
Occupation		
Unemployed	32	26.6
Employed	82	68.3
Student	6	5

The commonest symptoms women had been a combination of curdy white discharge, genital itching and redness in 28.3% of the women. 7 (5.8%) of the women had no symptoms at all.

Table 2: Symptoms patient presented with

Symptoms	Number of patients	Percentage
Itching	23	19.1
White Discharge	32	26.6
Erythema	10	14.1
Discharge + itching	14	11.6
Discharge+ itching+ erythema	34	28.3

35 (29.1%) of the women were pregnant and there predominant symptom was white discharge per vagina. 16 (13.3%) of the women had previous candidiasis and 16 (13.3%) had a prolonged use of antibiotic, which were over the counter. 11(9.1%) of the women used oral contraceptive as a method of contraception and 61 (50.8%) had copper t insertion following a child birth. 21 (17.5%) of the women had associated other vaginal infections and the comments was bacterial vaginitis.

Table 3: Risk factors associated

Risk factors	Number of patients	Percentage
Diabetes	7	5.8
Pregnancy	35	29.1
Previous Candidiasis	16	13.3
Over usage of antibiotics	16	13.3
Oral contraceptive	11	9.1
Intrauterine device	61	50.8
Other STD's	21	17.5

Discussion

Vaginal candidiasis is the commonest lower genital infection in women in the reproductive age group, most of the women will have the infection at least once in there life [20]. In our study the prevalence of the infection was 37.3% which was much lower than those found in Akortha *et al*, Srujana *et al* and Samal *et al* [21-23]. Like other major studies the prevalence of the infection was predominant between the age group 16-25 years. 62 (51.9%) of the women in our study were sexually active for duration of fewer 5 years. 82(68.3%) of the patients were employed and they were predominantly farmers by profession, with 7-9 hours of work per day.

In our study, on analysing the risk factors the most common was found to be intrauterine device and pregnancy. The association with intrauterine device was 61(50.8), these were the women with higher prevalence of bacterial vaginitis i.e in 21(17.5%) of the women. The association of diabetes was in 7(5.8%) of the women, use of oral contraceptive was in 11(9.1%) and antibiotics, which was predominantly over the counter was 16(13.3%). In comparison to a study done by Samal *et al* where in 25% of pregnancy was associated with vaginal candidiasis, followed by 23% with Intrauterine devices users, 17% were diabetics and 15% repeated antibiotic users [23]. In the study conducted by Sobel and Okungbova *et al*. pregnancy was the common associated condition, the reason being attributed to elevated steroid hormones in pregnancy which makes the vaginal mucosa acidic, predisposing it to vaginal infection [24-25]. Recurrent white discharge and previous vaginal candidiasis was reported to be 16(13.3%) in our study in concurrence with the study conducted by Robert *et al* [26].

Repeated use of antibiotic predominantly for upper respiratory tract infection, which is bought over the counter, was reported in 16(13.3%) of the women. The reason being the antibiotics eliminates the normal vaginal flora, which favors candida colonization. The reported association of use of intrauterine devise and vaginal candidiasis was in 50.8% of the population which was much higher than that reported in Mirela *et al* and Lunderstrom *et al* [27-28].

In our study cases of albicans was 60% of the women and non albicans was 40%, the commonest non albicans was *C. glabrata*. The women who had a non albicans infection has a history of topical treatment by anti-mycotic drugs including self medication and topical usage. The samples collected to detect vaginal candidiasis was first mounted on KOH then, a gram stain was performed and the microbial culture on Saboraud

dextrose agar, based on the color of the inoculate the species was identified i.e *C. albicans* (wet green colonies). *C. glabrata* (wet dark pink colonies), *C. tropicalis* and *C. dublinensis* (wet blue colonies).

Conclusion

A routine high vaginal swab for smear and culture must be performed for all women presenting with complaints of chronic white discharge and itching to rule out lower genital tract infection. Over the counter usage of antibiotic must be prevented to avoid opportunistic fungal infection and so should be over usage of antifungals without definitive diagnosis. The importance of association of pregnancy, preterm labor and intra uterine device with candidiasis strongly indicates the need of sex education for the vulnerable population.

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