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Research Article

Clinicopathological correlation of infective vaginal discharges in non pregnant sexually active women of reproductive age group in a tertiary care centre of Western UP

Aruna Verma[1]*, Abhilasha Gupta[1], Swati Goel[1], Amit Garg[2]

[1]Department of Obstetrics & Gynaecology and [2]Department of Microbiology, LLRM Medical College, Meerut, India

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***Correspondence:**
Dr. Aruna Verma
E-mail: arunatonk@yahoo.co.in

ABSTRACT

Background: The aim was to study the etiology of infective vaginal discharges prevalent in our area and to study its association with PID.
Methods: A total of 500 patients were recruited for study attending Gynae OPD and presenting with vaginal discharge. After detailed history taking and physical examination three sterile vaginal swabs were taken from the posterior fornix and sent for culture of Candida and Trichomonas on Saborauds Dextrose Agar and Kufperberg media respectively and one was used for smear for gram's staining to diagnose Bacterial vaginosis by Nugent's scoring.
Results: In this study, prevalence of BV, Candida and Trichomonas vaginalis was found to be 146 (29.2%), 106 (21.2%) and 15(3%) respectively out of 24 cases had mixed infections while no organism was found in 257 cases (51.4%). Candida infection was found to be significantly associated with presence of other complaints such as itching, burning micturition, dyspareunia etc ($p<0.001$), curdy white discharge ($p<0.001$), thick consistency ($p<0.001$), presence of vulvitis ($p<0.001$) and pH 3.5-4.0 ($p<0.0.001$). Bacterial vaginosis was found to be significantly associated with underweights ($p<0.004$), cases with >1 abortions($p=0.015$), presence of urogenital complaints ($p<0.001$), yellow/green ($p<0.001$) and purulent discharge ($p=0.013$), presence of malodour ($p<0.001$), thick consistency ($p<0.001$), moderate ($p<0.001$) and profuse ($p=0.004$) amount of discharge, vulvitis ($p=0.001$), cervical congestion ($p=0.004$), features of PID ($p<0.001$) and pH (4.6-5.0 & >5) ($p<0.001$). Trichomonas infection was found to be significantly associated with age group 31-35 ($p=0.019$), yellow/green vaginal discharge ($p<0.001$), presence of malodour ($p=0.016$), thick consistency of discharge ($p=0.040$), vulvitis ($p<0.001$) and pH>5 ($p=0.004$).
Conclusions: Bacterial vaginosis and candidiasis are the most common causes of infective vaginal discharges in our community than trichomoniasis.

Keywords: Vaginal discharge, Trichomonas vaginalis, Vaginosis, Candidiasis

INTRODUCTION

Abnormal vaginal discharge is the most common complaint of the women of reproductive age group attending Gynae OPD. About 50% women of reproductive age group present with this complaint.[1] Causes of infective vaginal discharges are mainly Bacterial vaginosis, candidal moniliasis, trichomoniasis, cervicitis due to gonorrhoea, Chlamydia. Bacterial vaginosis (BV) is the most common cause of vaginal infection.[2] About 1/3 of the women with abnormal vaginal discharges are positive for bacterial vaginosis. The causative organism was previously thought to be *Gardenella vaginalis (Haemophilus vaginalis).* The present concept is that along with G. vaginalis, anaerobic organisms such as *Bacteroides* species, *Peptococcus* species, mobiluncus and *Mycoplasma hominis* act synergistically to cause vaginal infection. Clinically

characterized by creamy vaginal discharge with fishy smell without extensive evidence of inflammation.

Trichomoniasis is caused by *Trichomonas vaginalis*, a flagellated motile protozoan. Approximately 174 million people world wide are infected with this parasite each making it the most common curable sexually transmitted infection worldwide. The organism is predominantly transmitted by sexual contact, the male harbours the infection in the urethra and prostate. Clinical features include sudden profuse and offensive vaginal discharge often dating from the last menstruation. There is irritation and itching of varying degrees within and around the introitus. There is presence of urinary symptoms such as dysuria and frequency of micturition. On examination there is thin greenish yellow and frothy offensive discharge per vaginum. The vulva is inflamed with evidences of pruritis. Vaginal examination may be painful. The vaginal walls become red and inflamed with multiple punctate haemorrhagic spots. Similar spots are also found over the mucosa of the portio vaginalis part of the cervix on speculum examination giving the appearance of "strawberry".

Another important cause of abnormal vaginal discharge is Vaginal Candidiasis. It is caused by *Candida albicans*, a gram positive yeast like fungus. It is therefore common in pregnancy & diabetes. Contraceptive pills also predispose to Candida vaginitis. It is also associated with prolonged use of antibiotics. A women complains of profuse thick curdy white discharge with flakes and intense pruritis. There is often soreness & edema of vulva. Dysuria, burning sensation & dyspareunia are other occasional symptoms. Signs include white patches or plaques of cheesy curdy material adherent to the vagina.

In order to ensure a rational choice for both empirical & definitive antibiotic therapy of vaginal discharge, it is very important to know the most frequently occurring infectious agent causing vaginal discharges in our community. There are considerable gaps in our knowledge of prevalence, etiology, clinical manifestations & management of vaginal discharge.

In the present study clinicopathological evaluation of vaginal discharge will be done to have an insight into the etiology of vaginal discharge in women presenting with this complaint.

Aims & Objectives

- To find out the Prevalence of various pathological agents in sexually active non- pregnant patients attending Gynae OPD in our hospital.
- To find out the correlation of vaginal discharge with PID.

METHODS

This is an observational analytical study & was conducted in the Department of Gynaecology & Obstetrics, SVBP Hospital, Meerut from May 2011- May 2012. A total of 500 non- pregnant married otherwise healthy women coming to Gynae OPD presenting with symptoms/signs of vaginal discharge were included in the study.

Inclusion Criteria

- Non – pregnant sexually active women
- Otherwise apparently healthy females presenting with symptoms/signs of vaginal discharge

Exclusion Criteria

- Pregnant females
- Postmenopausal women.
- Vaginal discharge due to malignancies or due to fibroid polyp.
- Women who had taken antibiotic treatment within last 2 wks.
- Women selected underwent the following after explaining the procedure.
- A thorough history taking including name, age, presenting complaints, obstetric history & menstrual history.
- Weight & height done and BMI calculated.
- General examination done & local examination including inspection of vulva, vagina and cervix done and findings recorded.

After inspection of vulva anterior and posterior (Sim's) vaginal speculum introduced, vagina & cervix visualized & the physical characteristics of discharge were noted for color, odour, pH, consistency & amount.

Two separate swabs were taken for Trichomonas & Candida culture & one for smear for Gram's staining.

- Swab taken for Trichomonas was inoculated immediately in Kupferberg's broth base media & sent to laboratory within an hour of collection.
- Candida was cultured on Sabaraud's Dextrose Agar in the laboratory.
- Smear was stained with Gram's stain for Bacterial vaginosis by Nugent's Criteria.
- Bimanual examination was done to note fornicial tenderness or cervical motion tenderness to find out any evidence of PID.

The laboratory reports were collected and analysed.

Statistical Analysis

Prevalence of the three pathogens were calculated as percentage. Chi Square test was applied to see the correlation of various pathogens with age, BMI, parity, no. of abortions, presenting complaints, characteristics of discharge, pH, PID and local examinations findings. P value and odd's ratio was calculated.

RESULTS

A total of 500 women fulfilling the inclusion criteria were enrolled in the study.

Maximum number of subject were in age group 26-30 years (32.6%) followed by those aged 20-25 years (24%), 31-35 years (22%), 36-40 years (16%) and 41-45 years (5.4%) respectively. Mean age of subjects was 30.25±5.82 years.

Majority of subjects (n=307; 61.4%) were in normal weight category. A total of 49 (9.8%) were in underweight and 113 (22.6%) were in overweight category. A total of 31 (6.2%) subjects were obese

Majority of subjects (n=463; 92.6%) were multipara (p1 and above). A total of 8 (1.6%) were nullipara (P0) and 29 (5.8%) were primipara (P1).

Majority of subjects had at least one abortion (64.2%). There were 203 (40.6%) subjects with history of only 1 abortion. A total of 118 (23.6%) had history of >1 abortions. There were 179 (39.8%) subjects with no history of abortion.

Vaginal discharge was the most common presenting complaint (n=446; 89.2%) followed by abdominal pain (n=365; 73%) and backache (n=243; 48.6%). A total of 174 (34.8%) had urogenital complaints too that included itching/burning micturition (n=111; 22.2%), dyspareunia (n=37; 7.4%), polymenorrhoea (n=17; 3.4%), menorrhagia (n=3; 0.6%), dysmenorrhoea and infertility (n=2; 0.4% each), post-coital bleeding and irregular menses (n=1; 0.2% each) (Table 1).

Table 1: Distribution according to presenting complaints*.

SN	Presenting Complaints	No. of cases	Percentage
1.	Vaginal discharge	446	89.2
2.	Backache	243	48.6
3.	Abdominal pain	365	73.0
4.	Urogenital symptoms	174	34.8

*A single subject can present with multiple complaints.

Maximum number of subjects had white discharge (48.4%) followed by those having curdy white discharge (17.8%), yellowish green (16.8%), mucoid (15.2%) and purulent (1.8%). Malodour was present in 85 (17%) specimen. Majority had thin consistency (59%) followed by those having thick consistency (41%). Majority of cases had moderate discharge (53.6%) followed by those having slight discharge (40.8%). A total of 28 (5.6%) had copious discharge (Table 2).

A total of 95 (19%) patients were diagnosed as vulvitis (19%). Hypertrophied cervix was observed in 40 (8%), 28 (5.6%) had ectopy, 26 (5.2%) had congested cervix. Mucopurulent cervicitis was diagnosed in 2 (0.4%). Features of PID were observed in 57 cases (11.4%). VIA was positive in 46 (9.2%) subjects (Table 3).

Table 2: Physical characteristics of vaginal discharge.

SN	Characteristic	No. of cases	Percentage
1.	Appearance		
	Curdy white	89	17.8
	Yellowish Green	84	16.8
	Mucoid	76	15.2
	Purulent	9	1.8
	White	242	48.4
2.	Malodour	85	17.0
3.	Consistency		
	Thick	205	41
	Thin	295	59.0
4.	Amount of discharge		
	Slight	204	40.8
	Moderate	268	53.6
	Profuse	28	5.6

More than half (59.4%) patients had vaginal pH 4.1-4.5, followed by those having vaginal pH between 4.5 to 5.0 (32.2%). There were 3.6% subjects with vaginal pH between 3.5 to 4.0 and 4.8% with vaginal pH (Table 4).

Majority of subjects (51.4%) had negative findings for presence of any pathogen. A total of 243 (48.6%) were positive for presence of pathogen – 24 (4.8%) were positive for multiple organisms whereas in 219 (43.8%) only one pathogen was isolated (Table 5).

Table 3: Per vaginum / per speculum findings.

SN	Finding	No. of cases	Percentage
1.	Vulvitis	95	19.0
2.	Cervical condition		
	Normal	406	81.2
	Hypertrophied	40	8.0
	Ectopy	28	5.6
	Congested	26	5.2
	Mucopurulent Cervicitis	2	0.4
3.	Features of PID	57	11.4
4.	VIA positive	46	9.2

Table 4: Distribution according to vaginal pH.

SN	Vaginal pH	No. of cases	Percentage
1.	3.5-4.0	18	3.6
2.	4.1-4.5	297	59.4
3.	4.5-5.0	161	32.2
4.	>5.0	24	4.8

Table 5: Distribution of subjects according to pathogen identified.

SN	Finding	No. of cases	Percentage
1.	Negative	257	51.4
2.	Bacterial vaginosis	146	29.2
3.	*Candida*	106	21.2
4.	*T. vaginalis*	15	3.0
5.	> 1 organism	24	4.8

Associations of Candidiasis

Urogenital complaints were significantly associated with presence of Candidiasis.

Curdy white discharge was significantly associated with candidal positivity (OR=17.71; 95% CI 10.28-30.53, p<0.001). Mucoid and white discharge were significantly negatively associated with Candidal positivity (OR=0.23 and 0.28 respectively) (p≤0.001). Mucoid and white discharge were significantly negatively associated with Candidal positivity (OR=0.23 and 0.28 respectively) (p≤0.001).

Odds for Candidal positivity were significantly higher in vaginal discharge with thick consistency (OR=7.055; 95% CI 4.29-11.59) (p<0.001).

Presence of vulvitis (OR=4.42) was found to be significantly associated with Candidal positivity (p<0.05). Odds of Candidal positivity were significantly higher among cases with pH 3.5-4.0 (OR=10.87).

Associations of BV

Cases with more than one abortions had significantly higher odds for BV positivity (OR=1.715; 95% CI 1.11-2.65). Presence of urogenital complaints was significantly associated with bacterial vaginosis. Yellow/Green discharge and purulent discharge had significantly higher odds of BV positivity (OR=3.39 and 5.01 respectively).

Presence of malodour had significantly higher odds for BV positivity (OR=5.38; 95% CI 3.29-8.81) (p<0.001).

Odds for BV positivity were significantly higher in vaginal discharge with thick consistency (OR=2.133; 95% CI 1.44-3.16) (p<0.001). Profuse and moderate amount of vaginal discharge had significantly higher odds for BV positivity (OR=3.0 and 2.87 respectively).

Presence of vulvitis (OR=4.07), congestion (OR=3.023), features of PID (OR=3.40) were found to be significantly associated with BV positivity (p<0.05). Higher vaginal pH (4.6-5.0 and >5.0) was significantly associated with higher risk of BV positivity (OR=8.53 and 6.13 respectively).

Associations of Trichomonas

None of the other associations except presence of urogenital complaints was significantly associated with trichomoniasis. All the cases of TV had yellow/green discharge showing a significant positive association (p<0.001). Thick consistency of vaginal discharge was significantly associated with higher odds of TV positivity (OR=2.97; 95% CI 1.001-9.90). Except for presence of vulvitis (OR=6.96) and pH>5.0 (OR=12.36) none of the other variables were found to be significantly associated with TV positivity.

DISCUSSION

In the present study incidence of bacterial vaginosis, Candidiasis and Trichomoniasis is found to be 29.2%, 21.2% and 3.0% respectively.

In a study conducted by Fang, Zou, Yang (2007) in the rural area of Shandong province in China, the prevalence of BV, trichomoniasis and candidiasis were 6.6, 2.9 and 3.9% respectively. In another study performed in Hamedan province, Iran, conducted by Shobeiri et al (2006) the prevalence of candidiasis, trichomoniasis, and BV was 17.2, 18.1, and 28.5%, respectively.

In another study conducted by Sihavang et al (2007) among women referred to hospital in Vientiane, the capital of Laos, the prevalence of BV, trichomoniasis and candidiasis were 24.5, 3.7 and 39.5% respectively. In another study conducted by Oleveira et al (2007) in the rural area of Northeast Brazil, 20% of women had BV, 4.1% trichomoniasis and 12.5% respectively.

Table 6: Different studies.

Study	Year	BV (%)	CANDIDA (%)	TV (%)
Present study	2012	29.2	21.2	3
Fang, Zou, Yang[10]	2007	6.6	3.9	2.9
Sihavang et al[11]	2007	24.5	39.5	3.7
Bhalla et al[5]	2007	32.8	-	-
Oleveira et al[12]	2007	20	12.5	4.1
Jindal et al[7]	2007	-	23.4	-
Shobeiri et al	2006	28.5	17.2	18.1
Demba et al	2005	47.6	-	-
Braham et al	2006	16.2	4.8	6.6
Haytham et al	1999	-	21.5	15.5
Jumbo et al	2004	-	29.1	-

Bhalla et al conducted a study on prevalence of bacterial vaginosis among women in Delhi in 2007 and found Bacterial vaginosis was diagnosed in (32.8%) subjects. A high percentage though asymptomatic (31.2%) were found to have bacterial vaginosis. Highest prevalence was seen in urban slum (38.6%) followed by rural (28.8%) and urban middle class community (25.4%). All women with vaginal trichomoniasis were found to have bacterial vaginosis while 50 per cent of subjects having syphilis also had bacterial vaginosis.

Jindal et al conducted an epidemiological study on vaginal candidiasis in women of child bearing age in Amritsar, Punjab in 2007 and found among 350 women of 16-45 years of age, with the complaints of vaginal discharge and/or vaginal itching positive culture for *Candida* species was obtained in 82 (23.4%) women. Of these, 61 (74.4%) were *Candida albicans* and 21 (25.6%) were non *C . albicans. C. glabrata* was the most common nonalbicans species (9, 11%) followed by *C. tropicalis* (5, 6%), *C. krusei* (3, 3.6%) and *C. parapsilosis* and *C. guilliermondii* (2, 2.43%) each.

Demba et al conducted a study aimed at determining the prevalence of BV and patterns of BV-associated vaginal micro-flora among women with vaginal discharge syndrome (VDS) in The Gambia, West Africa (2005) and found BV prevalence was 47.6% by Nugent's score and 30.8% by Amsel's clinical criteria.

Allsworth et al combined data from the 2001-2002 and 2003-2004 National Health and Nutrition Examination Surveys in US and found almost one third of women (29%) were positive for bacterial vaginosis.

Braham et al conducted a study on 500 non-pregnant married women randomly selected for this study. This is a descriptive-analytic study conducted among non-pregnant referred to primary healthcare centres in Zanjan between May to August 2006. The prevalence of RTI was 27.6%. Out of which 16.2% was devoted to bacterial vaginosis (BV), 6.6% to trichomoniasis and 4.8% to vulvovaginal candidiasis (VVC) (Table 6).

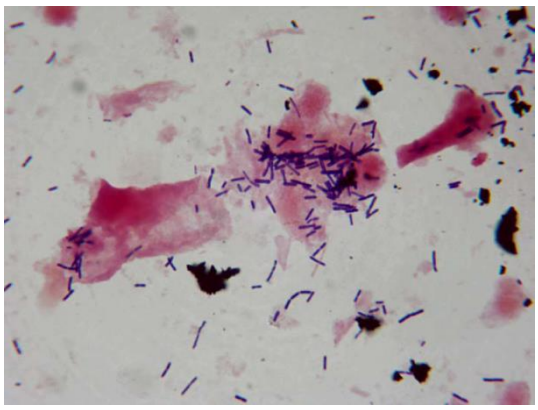

Figure 1: Microscopy of normal vaginal discharge showing Lactobacilli.

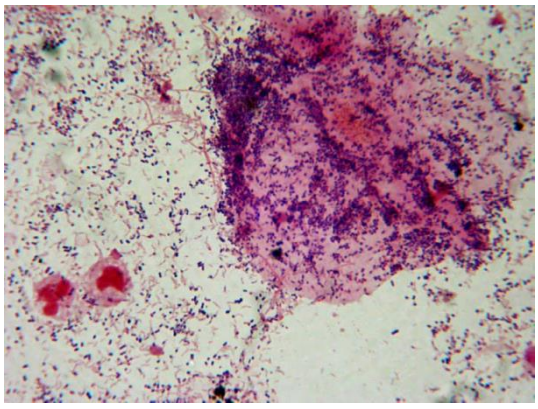

Figure 2: Microscopy of bacterial vaginosis.

CONCLUSION

Thus to conclude BV and candidiasis are the most common causes of infective vaginal discharges in our community than trichomoniasis. PID is significantly associated with pathogen positivity as well as BV. About 50% of patients presenting with vaginal discharge are not positive for any pathogen. So antibiotic therapy should be given cautiously based on colour, consistency, odour and amount of discharge and presence of other urogenital

symptoms as well as microbiological diagnosis when possible. Empirical therapy should cover bacterial as well as candidal infections. Routine microbiological diagnosis is recommended where ever facilities are available to prevent inadvertent use of antibiotics but and then treatment should be given according to the pathogen detected.

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