

## Causes and Management of Pathological Vaginal Discharge

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### Abstract

**PURPOSE:** Vaginal discharge is a very common symptom in primary health care. It accounts for 1% of all consultations in the Pakistan, and is the second most common gynecological problem after menstrual disorders.

**METHOD:** The study was conducted at the services Hospital, Lahore, Pakistan and lady wallingdon hospital, Lahore, Pakistan, between June and July 2010, inclusive. There was an accurate census of the total number of female patients attending the hospital during the period of the study. All were screened for vaginal discharge. Data collection sheet included patients' demographic information, clinical features and prescribed medications.

**RESULTS:** The causes of vaginal discharge were evaluated and their cross comparison with effecting factors was done. **CONCLUSION:** All the findings raise the need for health educational programs through different media to educate women about the difference between normal and abnormal vaginal discharge, and when to consult their family physician. Further research with larger sample sizes is needed to study the known risk factors and other local factors in this Muslim community, such as male circumcision and personal hygiene rituals.

### INTRODUCTION

Vaginal discharge is a common presenting symptom seen by doctors in many services (primary care, gynecology, family planning, and departments of genitourinary medicine) (1). Vaginal discharge may be physiological or pathological. Although abnormal vaginal discharge often prompts women to seek screening for sexually transmitted infections (STIs). Vaginal discharge is poorly predictive of the presence of an STI. This article focuses on the causes and diagnosis of vaginal discharge and treatment of the most common infective causes (2)

Normal vaginal floras (lactobacilli) colonize the vaginal epithelium and may have a role in defense against infection. They maintain the normal vaginal pH between 3.8 and 4.4. The quality and quantity of vaginal discharge may alter in the same woman in cycles and over time; each woman has her own sense of normality and what is acceptable or excessive for her. Vulvovaginal candidiasis is a common infective cause of vaginal discharge that affects about 75% of women at some time during their reproductive life, with 40-50% having two or more episodes. Bacterial vaginosis is one of the most common diagnoses in women attending genitourinary medicine clinics.

As 50% of cases of bacterial vaginosis are asymptomatic, the true prevalence of this condition in the community is uncertain. Bacterial vaginosis is associated with a new sexual partner and frequent change of sexual partners. A reduced rate of bacterial vaginosis is seen among women in monogamous sexual relationships, but it can occur in virginal women. Increased rates of bacterial vaginosis occur in certain groups of women, such as black African women, lesbians, and smokers. Recurrence of bacterial vaginosis after treatment is common and can be increased by personal

Hygiene practices, such as vaginal douching, that disrupt the normal vaginal flora. Bacterial vaginosis may also be associated with concurrent STIs, commonly *Trichomonas vaginalis*(3). Bacterial vaginosis is associated with pelvic infection after induced abortion and in pregnancy with pre-term delivery and low birthweight babies. Trichomoniasis is less common in affluent countries but reaches high levels (often 10-20%) among poor women in developing countries as well as among disadvantaged women in affluent countries. Although vulvovaginal candidiasis and bacterial vaginosis often develop independently of sexual activity, trichomoniasis is mainly sexually transmitted and has been ranked by the

World Health Organization as the most prevalent non-viral STI in the world, with an estimated 172 million new cases a year.

As mentioned above, self reported symptoms and the clinical appearance of vaginal discharge are both very variable and do not permit accurate determination of the presence or absence of a specific STI. A full screen to exclude STIs is essential to avoid delayed diagnosis and possible long term complications (4).

A woman's STI risk can be assessed by taking a sexual history. Primary care practitioners can then decide whether it is appropriate to refer a woman with identified risk factors directly to a genitourinary medicine clinic for further management.

The advantage of managing vaginal discharge in a genitourinary medicine clinic is that full microbiological tests are done to establish an accurate diagnosis. Microscopy is also carried out routinely for symptomatic cases, so an immediate diagnosis will be available for many women.

The presence of lower abdominal pain, cervical excitation pain, and adnexal tenderness in association with abnormal vaginal discharge implies pelvic inflammatory disease.

Syndromic management is based on the patient's symptoms and can be undertaken without laboratory support. A flow chart is used to guide the healthcare provider to the most appropriate treatment for a given set of symptoms and signs in a woman with a specifically defined risk history. Ideally, these flow charts are based on the local prevalence of STIs, their associated risk factors, and antibiotic sensitivities. (5)

Women with vulvitis caused by vulvovaginal candidiasis may respond best to a combination of intravaginal and topical vulval therapy. It should be noted that miconazole and econazole have an adverse effect on latex condoms, which could cause condom failure. Oral metronidazole, which is used for treating both bacterial vaginosis and *T vaginalis*, is associated with a metallic bad taste in the mouth, gastrointestinal disturbance, and a disulfiram reaction with alcohol. Patients

should be advised to avoid alcohol during and for 48 hours after treatment. In the past, questions have been raised about the safety of metronidazole in pregnancy, especially during the first trimester. The current British treatment guidelines advise that no toxicity in pregnant humans has been established. Treatment of symptomatic patients during pregnancy may produce more benefit than harm, and low dose treatment can be used in the first trimester, where clinical indications are present.

Many women self diagnose and self treat episodes of vaginal infection with over the counter treatments and may subsequently present with a history of "recurrent thrush," never having had this diagnosis confirmed by microbiological tests.

It is important to confirm the diagnosis and to ensure a full sexual health screen has been done to exclude concurrent infection (6). Management of vaginal discharge requires an empathic approach with reassurance and psychological support as necessary.

Vaginal discharge is a very common symptom in primary health care. It accounts for 1% of all consultations in the Pakistan and is the second most common gynecological problem after menstrual disorders (7, 8). One woman in 10 will present with vaginal discharge in the course of a year. Some women regard almost any secretion from the vagina as abnormal discharge, and the first task for a primary care physician is to ascertain whether it is physiological or pathological. Although vaginitis is not a serious condition in strictly medical terms, it may have repercussions on a woman's life (9). The microbiology of vaginitis has been studied frequently and the most common types reported are *Gardnerella*, *Candida*, and *Trichomonas vaginitis* (10).

Novelty of the study: this study will fill the considerable gaps in our knowledge of the prevalence, etiology, clinical manifestations and management of vaginal discharge.

## MATERIALS AND METHOD

The study was conducted at the services Hospital, Lahore, Pakistan and lady wallingdon hospital, Lahore, Pakistan, between June and

July 2010, inclusive. The hospital caters for citizens from all over the Lahore and also provides treatment for near by cities. Only patients aged 12 years and over were included. There was an accurate census of the total number of female patients attending the hospital during the period of the study. All were screened for vaginal discharge. Those who were identified as complaining of vaginal discharge symptoms had a detailed medical history, clinical examination and appropriate investigations done. Data collection sheet included patients' demographic information, clinical features and prescribed medications.

## RESULTS

Of the 30 females attending the SHL and LWH over a 1-month period, (6.4%) complained of vaginal discharge. Only 17 of them had positive cultures, with an infection rate of (56.6%). The types of organisms isolated were *G. vaginalis* affecting (28%), *C. albicans* affecting (12%), *Streptococcus* group B affecting (4.5%) and *T. vaginalis* affecting (4%). Only one case of gonorrhoea was identified. Table I shows the demographic characteristics of patients with vaginal discharge.

**TABLE I** Demographic characteristics of patients complaining of vaginal discharge.

<i>Characteristics</i>	<i>Frequency %</i>
<b>Age</b>	
18-24	(30)
25-34	(47)
35+	(23)
<b>Citizenship</b>	
Lahore	(76)
Non-lahore	(24)
<b>Educational level</b>	
Illiterate	(34)
Literate to signage primary	(38)
primary	(28)
<b>Marital Status</b>	
Married	(93)
Not married	(7)
<b>Occupational level</b>	
Employed	(11)
Unemployed	(89)
<b>Residence</b>	
punjab	(97)
Outside punjab	(3)

**TABLE II** Demographic characteristics of patients by type of organism.

<i>Characteristics</i>	<i>Frequency %</i>	<i>Nil</i>	<i>GV</i>	<i>CA</i>	<i>Strep</i>	<i>TV</i>	<i>Others</i>
<b>Age</b>							
18-24	(30)	2	1	5	1	1	7
25-34	(47)	3	2	1	3	3	5
35+	(23)	1	1	5	4	1	4
<b>Nationality</b>							
lahore	(76)	6	5	6	6	4	1
Non-lahore	(24)	1	1	5	2	3	4
<b>Educational level*</b>							
Illiterate	(34)	3	1	6	2	4	3
rudimentary	(38)	2	1	1	3	1	5
primary	(28)	1	2	2	3	2	6
<b>Marital Status</b>							
Married	(93)	6	4	1	8	7	1
Not married	(7)	8	2	2	0	0	1
<b>Occupational level</b>							
Employed	(11)	6	10	0	0	2	1
Unemployed	(89)	7	9	2	8	5	1
<b>Residence</b>							
punjab	(97)	7	9	2	8	7	1
Outside punajb	(3)	4	0	1	0	0	0

**TABLE III** Association of suspected risk factors with vaginal infection.

<i>Suspected risk factors</i>	<i>Frequency (%)</i>	<i>Infection rate (%)</i>
Oral contraceptives	(33.1)	53.5
Antibiotics	(4.0)	71.4
Antiseptic	(6.2)	54.5
Douche	(4.5)	75.0
Fear of disease or pregnancy	(4.0)	28.5
Obsessional intolerance of any discharge	(3.4)	16.6
PMH of diabetes mellitus	(4.0)	71.4
PMH of chronic ill health	(2.2)	50.0
PMH of recurrent vaginal discharge.	(28.0).	63.2

PMH=past medical history.

The patients' ages ranged from 18 to 50 years, and about 76% were Lahore residents. About 93% were married and 11% were employed. The majority of patients (66%) had completed at least elementary and primary education. The distribution of infection with different demographic variables is demonstrated in Table II.

Only educational level was significantly related to infection. Table II also shows the association between these demographic characteristics and the type of organisms isolated. The peak age group (47%) for vaginal infections was 25-34 years. Most of the specific vaginal infections occurred in this age group. The infection rate increased with the level of education. Of all the infected patients, the illiterate group represented 26.2%, the rudimentary group 40.5% and the primary/secondary group 33.3%. The majority of *G. vaginalis* cases (40.8%) occurred in the highly educated group, while cases of *C. albicans* (62%) occurred mostly in the elementary/intermediate group. About 57% of *T. vaginalis* infections were isolated from the illiterate group.

Table III shows the association of various risk factors with vaginal infection. About 33% of the patients were on oral contraceptives, and 4% were on prescribed antibiotics, while 6% and 4.5% of the patients were using vaginal and antiseptic douches, respectively. The infection rate with respect to the various risk factors was highest among patients using vaginal douches

(75%), oral antibiotics (71%) and those with a past history of diabetes mellitus (71%) or a past history of recurrent vaginal discharge (63%). Also, 50% of patients with *Streptococcus*, 38% with *C. albicans* and 26.5% with *G. vaginalis* infections were using oral contraceptives. Only 4% of *C. albicans* cases were on antibiotics, while 62% and 36% of patients using vaginal douches and antiseptics, respectively, had *G. vaginalis* infections. 4% of the patients had diabetes mellitus, of which only one presented with candidiasis. Twenty-eight percent of the women had a history of recurrent vaginal discharge. This occurred in 71%, 38% and 24% of those with *T. vaginalis*, *C. albicans* and *G. vaginalis* infections, respectively. Clinical signs and symptoms are illustrated in Table IV.

These were examined in relation to infection and to the specific type of organisms. The color of discharge was significantly related to infection. White was the most common color, representing 50.8% of the complaints. The infection rate of patients complaining of white vaginal discharge was 48.3%. Of patients presenting with *C. albicans* vaginal infection and *T. vaginalis*, 71% had white discharge. Yellow vaginal discharge came next, representing 41% of the complaints and with an infection rate of 62.5%.

This yellow discharge occurred commonly among *G. vaginalis* infections (76%). Gray discharge was the least common (6.2%), however, the infection rate was 81.8%.

**TABLE IV. Clinical signs and symptoms in relation to occurrence of vaginal infection.**

<i>Sign and symptoms</i>	<i>Frequency (%)</i>	<i>Infection rate (%)</i>
<b>Color*</b>		
White	(50.8)	48.3
Yellow	(41.1)	62.5
Gray	(6.2)	81.8
<b>Consistency</b>		
Thick creamy	(58.2)	64.7
Watery	(24.5)	25.5
Frothy	(17.1)	73.3
<b>others</b>		
Relation to period**	(14.2)	60
Pruritis	(59.4)	36.5
Odor 117 (66.8) 62.3	(66.8)	62.3
Dysuria 32 (18.2) 53.1	(18.2)	53.1
Cervical erosions	(8.5)	53.1

\*3 patients were not included as the description of the color of discharge did not fit any of the three colors mentioned;

\*\*including symptoms occurring before and after periods,

Ten percent of patients infected with *G. vaginalis* and 12.5% with *Streptococcus* presented with gray discharge. The consistency of discharge was also related to infection. Thick creamy discharge was the most common presentation (58.2%), occurring in 90% of the cases of *C. albicans*, 61% of *G. vaginalis* and 57% of *T. vaginalis*, with an infection rate of 64.7%.

Watery discharge came next (24.5%), with an infection rate of 25.5%, and 37.5% of *Streptococcus* and 12% of *T. vaginalis* presented with this consistency. The least common texture was frothy discharge, occurring in only 17.1% of the cases and with an infection rate of 73.3%. It occurred in 42% of cases of *T. vaginalis* and 26% of *G. vaginalis*. Malodor of discharge was significantly related to infection. Nearly 67% of the patients complained of malodor, and these had an infection rate of 62.3%. Eighty-six percent of *T. vaginalis*, 80% of *G. vaginalis* and 62% of *C. albicans* infections reported malodor. Of these vaginal infections, 57% of *T. vaginalis*, 14% of *G. vaginalis* and 9% of *C. albicans* had a fishy odor. Only seven patients complained of odor after intercourse, of whom four (57.14%) had *G. vaginalis* infection. The

relation of menstrual periods, pruritis, dysuria and cervical erosion to infection and the type of organism was not significant. 28% of patients were reassured without prescribing any medication. Out of these, 0.5% patients were found to have positive results. Metronidazole was the most commonly prescribed drug (63 cases, 36%), particularly in the case of *G. vaginalis* and *T. vaginalis* infections. Clotrimazole was issued in 23% of cases, of which 4% had *C. albicans* infections and 3.5% had negative results. Penicillin was the most commonly prescribed drug with cases of *Streptococcus* infection (50%).

## DISCUSSION

This study showed a prevalence rate of 6.4% of vaginal discharge among primary health care patients in the Lahore, Pakistan. National and international comparisons are hampered because of the different methodology of studies. The majority of studies investigated the prevalence of each organism separately, while others studied high-risk population groups. In this study, the finding of *G. vaginalis* as the most commonly isolated organism, with a prevalence rate of 28%, is in agreement with other studies that showed different rates

ranging from 9% to 53%. These variations in the rates could be related to geographical distribution or systematic differences in the various population samples, however, there is continuing controversy about its importance as a pathogen and its ability to cause vaginitis. The term “bacterial vaginosis” (BV) is a variant of bacterial vaginitis and is the most prevalent vaginal infection. It is a clinical syndrome associated with *Gardnerella* and/or anaerobes, characterized by foul-smelling discharge, and diagnosis is based on the fulfillment of three of the following criteria:

1. Typical discharge pH >4.5
2. Positive amine test
3. Presence of clue cell

In the present study, no association was found between vaginal infection and citizenship. McCormack et al.<sup>21</sup> found that non-white race was significantly associated with *G. vaginalis* colonization, although no explanation was offered. Perhaps future studies designed to include different races will resolve this association.

The peak age of *G. vaginalis* in this study was 25-34 years, similar to the findings of Chowdhury et al. No statistically significant association was found between age and infection. This is in contrast to other studies that showed marked increase in the prevalence of bacterial vaginosis with increasing age. There was also no significant association with both marital status and employment, although other studies have associated bacterial vaginosis with the unmarried and the unemployed. Perhaps the low frequency of the last two explains failure to detect statistical significance. The findings that infection rates were highest among rudiments and primary educated could be explained by the fact that literate patients are more likely to be better informed about physiological and pathological vaginal discharge and thus more likely to seek health services. Factors reported to reduce the risk of *G. vaginalis*, such as oral contraceptives and antibiotics, were not found to be significant in this study. Unfortunately, intrauterine devices (IUD), which have been reported to be highly associated with BV, were not examined

in the present study. A striking finding is the relationship of the color, consistency and odor of discharge with the risk of infection. There was almost a 50% reduction in this risk with white discharge versus other colors, and 17% reduction with watery consistency versus other consistencies. The risk of infection for both thick creamy discharge and malodor was more than two-fold. This is consistent with the usual clinical practice where a whitish, watery discharge without malodor is unlikely to be pathological. In this study, the majority of patients with *G. vaginalis* isolated complained of yellow or white discharge with thick creamy consistency and malodor. There have been discrepant descriptions of *G. vaginalis* discharge, some authors reporting the classical description of thin, gray, homogenous and frothy, and others a description of white and yellow, which is similar to our findings. *C. albicans*, with a prevalence rate of 12% of symptomatic patients, was the next commonly isolated organism. This is within the range of reported values (2.2%-20%). The woman's level of education was also associated with candidiasis. Moderately educated women (elementary group) complained mostly of *Candida* infections. This could be related to factors such as the number of pregnancies and the use of antibiotics. Unfortunately, the number of *Candida* isolates was not large enough to detect the significance of such factors. Furthermore, no statistically significant association was found between the use of oral contraceptive, antibiotics or previous history of diabetes mellitus, in contrast to other studies. Vaginal discharge was mostly white, thick and creamy, which is consistent with the classical description of *Candida* vaginal discharge. Surprisingly, mal odor, which is not a common complaint, was reported by 62% of our patients. This could be explained by patients' obsession with odor. The lack of association between *Candidiasis*, suspected risk factors and pruritis could be related to the small sample size. The prevalence of *Streptococcus* group B infection and trichomoniasis in this study (4.5% and 4%) are in the lower range of what has been previously reported. Neither infection

showed any significant association with the suspected risk factor, in contrast to other studies. Possibly, the small numbers of isolates could explain the absence of statistical significance. The clinical presentation of vaginal discharge due to *Streptococcus* infection was whitish, thick, creamy and sometimes watery; contrasting with the classic description. *T. vaginalis* discharge was also described as whitish, thick and creamy. Frothiness was reported in 24% of the cases, even higher than in other studies. Although pruritis is a common and disturbing symptom, it occurred in only a few cases. On the other hand, malodor was a major complaint, with fishy smell being the most common. This description is different from the classical heavy purulent yellow green offensive discharge with severe pruritis. Only one case of gonorrhoea was found, with a prevalence of 0.56%, thus becoming among the lowest reported.. Some of the discrepancies in the findings of this and other studies probably result from the wide diversity of patterns of vaginal infections in different populations. However, in this setting, *G. vaginalis* and *C. albicans* organisms accounted for most vaginal infections. The prevalence of trichomoniasis and gonorrhoea is among the lowest reported and could be explained by the strict religious and cultural beliefs which prohibit illegal sexual relationships. Among the limitations of this study was the inability to test for chlamydia due to the unavailability of the media in our hospitals. The results support the classical description of physiological vaginal discharge as whitish, odorless and of watery consistency, and the pathological vaginal discharge as thick and creamy with malodor. The paradoxical finding that educational level is related to vaginal infection, with *G. vaginalis* occurring mostly in the highly educated, is to our knowledge being reported for the first time.

## CONCLUSION

All these findings raise the need for health educational programs through different media to educate women about the difference between normal and abnormal vaginal discharge, and

when to consult their family physician. Further research with larger sample sizes is needed to study the known risk factors and other local factors in this Muslim community, such as male circumcision and personal hygiene rituals.

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