

PATIENTS WITH VAGINAL DISCHARGE: A SURVEY IN A UNIVERSITY PRIMARY CARE CLINIC IN RIYADH CITY

Joharah M. Al Quaiz, MRCGP

Vaginal discharge is a very common symptom in primary health care.¹ It accounts for 1% of all consultations in the UK,² and is the second most common gynecological problem after menstrual disorders.³ One woman in 10 will present with vaginal discharge in the course of a year.⁴ 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. The microbiology of vaginitis has been studied frequently and the most common types reported are *Gardnerella*, *Candida*, and *Trichomonas vaginitis*.^{1,3}

Primary care has expanded dramatically in the Kingdom of Saudi Arabia during the past two decades due to rapid socioeconomic development of the country.⁵ However, information about the morbidity patterns of patients at primary care clinics (PCC) is still lacking. There are considerable gaps in our knowledge of the prevalence, etiology, clinical manifestations and management of vaginal discharge. The aim of this study was to determine the prevalence, the presentation and patterns of care of women with vaginal discharge and some common organisms causing it among primary care patients.

Patients and Methods

The study was conducted at the PCC of King Khalid University Hospital, Riyadh, Saudi Arabia, between January and June 1998, inclusive. The hospital caters for Saudi citizens from all over the Kingdom and also provides treatment for expatriates. Only patients aged 12 years and over were included. There was an accurate census of the total number of female patients attending the PCC 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. The patients were followed up after their initial visit to determine the outcome of management.

C. albicans infection was investigated by taking a high vaginal swab and culturing it on Sabouraud's medium. Infection with *T. vaginalis* was identified by its characteristic morphology and motility in a wet mount examined microscopically immediately after collection. Other organisms such as *G. vaginalis* and *Streptococcus* group B were cultured. Cases with a suspicious history of gonorrhoea or with pus issuing from the cervix had swabs taken from the endocervix, urethra and rectum. As well, an immediate smear for Gram's stain was sent to the laboratory. Chlamydial infections were not investigated due to the unavailability of medium in the primary care clinics. Data were processed in a microcomputer and then analyzed. The chi-square and Fisher's exact tests were used to test the association between organisms and studied variables. Odds

TABLE 1. Demographic characteristics of patients complaining of vaginal discharge.

Characteristics	Frequency %
Age	
18-24	52 (30)
25-34	83 (47)
35+	40 (23)
Nationality	
Saudi	133 (76)
Non-Saudi	42 (24)
Educational level	
Illiterate	60 (34)
Elementary/Intermediate	66 (38)
Secondary/University	49 (28)
Marital Status	
Married	162 (93)
Not married	13 (7)
Occupational level	
Employed	19 (11)
Unemployed	156 (89)
Residence	
Riyadh	170 (97)

From the Department of Family and Community Medicine, College of Medicine, King Saud University, Riyadh, Saudi Arabia.

Address reprint requests and correspondence to Dr. Al Quaiz: Department of Family and Community Medicine (34), College of Medicine, King Saud University, P.O. Box 2925, Riyadh 11461, Saudi Arabia. E-mail: johara_m@hotmail.com.

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Outside Riyadh 5 (3)

TABLE 2. Demographic characteristics of patients by type of organism.

Characteristics	Frequency %	Nil	GV	CA	Strep	TV	Others
Age							
18-24	52 (30)	22	16	5	1	1	7
25-34	83 (47)	38	23	11	3	5	3
35+	40 (23)	16	10	5	4	1	4
Nationality							
Saudi	133 (76)	62	35	16	6	4	10
Non-Saudi	42 (24)	14	14	5	2	3	4
Educational level*							
Illiterate	60 (34)	34	11	6	2	4	3
Elementary/Intermediate	66 (38)	26	18	13	3	1	5
Secondary/University	49 (28)	16	20	2	3	2	6
Marital Status							
Married	162 (93)	68	47	19	8	7	13
Not married	13 (7)	8	2	2	0	0	1
Occupational level							
Employed	19 (11)	6	10	0	0	2	1
Unemployed	156 (89)	70	39	21	8	5	13
Residence							
Riyadh	170 (97)	72	49	20	8	7	14
Outside Riyadh	5 (3)	4	0	1	0	0	0

*As compared with educational level, $P < 0.03$; GV=*Gardnerella vaginalis*; CA=*Candida albicans*; Strep=*Streptococcus* group B; TV=*Trichomonas vaginalis*.

ratios and 95% confidence limits (calculated by Cornfield's approximation method) were used to assess the risk of infection.

Results

Of the 2719 females attending the PCC over a 6-month period, 175 (6.4%) complained of vaginal discharge. Only 99 of them had positive cultures, with an infection rate of (56.6%). The type of organisms isolated were *G. vaginalis* affecting 49 (28%), *C. albicans* affecting 21 (12%), *Streptococcus* group B affecting 8 (4.5%) and *T. vaginalis* affecting 7 (4%). Only one case of gonorrhoea was identified. Table 1 shows the demographic characteristics of patients with vaginal discharge. The patients' ages ranged from 18 to 50 years, and about 76% were Saudis. About 93% were married and 11% were employed. The majority of patients (66%) had completed at least elementary and intermediate education.

The distribution of infection with different demographic variables is demonstrated in Table 2. Only educational level was significantly related to infection ($P < 0.05$). Table 2 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 elementary/intermediate group 40.5% and the secondary/university 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 3 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%), ($P > 0.05$). Also, 50% of patients with *Streptococcus*, 38% with *C. albicans* and 26.5% with *G. vaginalis* infections were using oral contraceptives ($P > 0.05$). 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 ($P > 0.05$). Seven (4%) of the patients had diabetes mellitus, of whom only one presented with candidiasis ($P > 0.05$). 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 ($P > 0.05$).

Clinical signs and symptoms are illustrated in Table 4. These were examined in relation to infection and to the specific type of organisms. The color of discharge was significantly related to infection ($P > 0.01$). 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% (OR=0.5, 0.26-0.96). Of 21 patients

TABLE 3. Association of suspected risk factors with vaginal infection.

Suspected risk factors	Frequency (%)	Infection rate (%)	Odds Ratio (OR)	95% CI
Oral contraceptives	58 (33.1)	53.5	0.82	0.41-1.63
Antibiotics	7 (4.0)	71.4	1.96	0.32-14.2
Antiseptic	11 (6.2)	54.5	0.91	0.23-3.57
Douche	8 (4.5)	75.0	2.38	0.41-16.6
Fear of disease or pregnancy	7 (4.0)	28.5	0.29	0.03-1.75
Obsessional intolerance of any discharge	6 (3.4)	16.6	0.14	0.006-1.3
PMH of diabetes mellitus	7 (4.0)	71.4	1.96	0.32-14.28
PMH of chronic ill health	4 (2.2)	50.0	0.76	0.07-7.6
PMH of recurrent vaginal discharge	49 (28.0)	63.2	1.47	0.71-3.03

PMH=past medical history.

TABLE 4. Clinical signs and symptoms in relation to occurrence of vaginal infection.

Sign and symptoms	Frequency (%)	Infection rate (%)	Odds Ratio (OR)	95% CI
Color*				
White	89 (50.8)	48.3	0.5	0.26-0.96 ⁺
Yellow	72 (41.1)	62.5	1.51	0.78-2.93
Gray	11 (6.2)	81.8	3.7	0.71-25.6
Consistency				
Thick creamy	102 (58.2)	64.7	2.22	1.15-4.3 ⁺
Watery	43 (24.5)	25.5	0.17	0.07-0.4 ⁺
Frothy	30 (17.1)	73.3	2.43	0.95-6.39
Relation to period**	25 (14.2)	60	1.18	0.46-3.04
Pruritis	104 (59.4)	36.5	0.81	0.42-1.56
Odor	117 (66.8)	62.3	2.04	1.03-4.0 ⁺
Dysuria	32 (18.2)	53.1	0.84	0.36-1.96
Cervical erosions	15 (8.5)	53.1	0.86	0.26-2.77

*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, ⁺significant, $P<0.05$.

presenting with *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%. 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 ($P=0.001$). 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% (OR=2.22, 1.15-4.3). Watery discharge came next (24.5%), with an infection rate of 25.5% (OR=0.17, 0.07-0.40), 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

presenting with *C. albicans* vaginal infection and 7 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 ($P<0.03$). Nearly 67% of the patients complained of malodor, and these had an infection rate of 62.3% (OR=2.04, 1.03-4). 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. Fifty patients (28%) were reassured without prescribing any medication. Out of these, six 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 41 cases (23%), of which 18 had *C. albicans* infections and 15 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 city of Riyadh in the Kingdom of Saudi Arabia. National and international comparisons are hampered because of the different methodology of studies. The majority of studies investigated the prevalence of each organism separately,^{1,6,7,8} while others studied high-risk population groups.^{1,9,10} 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%.^{4,9,11-15} 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.^{4,16} The term "bacterial vaginosis" (BV) is a variant of bacterial vaginitis and is the most prevalent vaginal infection.¹⁶⁻¹⁹ 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^{16,20}

In the present study, no association was found between vaginal infection and nationality ($P>0.05$). The non-Saudi patients in the study were mostly from Arab countries with almost similar race, culture and lifestyle. McCormack et al.²¹ 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.¹¹ 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.²² 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 secondary school and university graduates could be explained by the fact that highly educated patients are more likely to be better informed about physiological and pathological vaginal discharge and thus more likely to seek health services. The increase in the prevalence of *G. vaginalis* as the level of education increased could suggest age as a confounding factor because younger generations are more likely to receive higher education. In fact, university education for females in Saudi Arabia has been established for only the last 20-25 years.

A major risk factor to increase *G. vaginalis* infection is vaginal douching. Douching leads to changes in the vaginal pH and altered microbial flora.²³ In this study, the infection rate with respect to various risk factors was highest among those who douched, with *G. vaginalis* being the most commonly associated organism with such behavior, however, no statistical significance was found, probably due to the small sample size. Other factors reported to reduce the risk of *G. vaginalis*, such as oral contraceptives²² and antibiotics,¹ were not found to be significant in this study. Unfortunately, intrauterine devices (IUD), which have been reported to be highly associated with BV,^{1,6} 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,²⁴ and others a description of white and yellow,^{25,26} 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%).^{1,9,10,27} The woman's level of education was also associated with candidiasis ($P<0.03$). Moderately educated women (elementary/intermediate 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.^{1,7,28} Vaginal discharge was mostly white, thick and creamy, which is consistent with the classical description of *Candida* vaginal discharge.^{25,26,28} Surprisingly, malodor, 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.^{1,8,29} Neither infection showed any significant association with the suspected risk factor, in contrast to other studies.^{21,30} 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.⁸ *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.³¹ 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.^{25,26} Only one case of gonorrhea was found, with a prevalence of 0.56%, thus becoming among the lowest reported.^{32,33,34}

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 gonorrhea 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 primary care clinics. 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. 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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