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Risk Factors and Health Hazards of Vaginal Infections in Upper Egypt: A Cross Sectional Study

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ABSTRACT

Objective: The complaint of abnormal vaginal discharge is very common particularly in developing countries with low socioeconomic level as Egypt. The study aims to determine the frequency of vaginal infections among Upper Egypt women with evaluation of the related risk factors and health hazards in addition to study the habit of vaginal douching, its possible relation to vaginal infections.

Materials and Methods: A cross sectional observational study was done in Women Health Hospital – Assiut University-Egypt. A trained clinic nurse administered an interview-administered questionnaire to 326 women. Women presented to the outpatient clinic and diagnosed to have any type of vaginal infections were approached for participation. The principle outcome was to study the common predisposing factors, different types of vulvovaginal infection and possible common reproductive hazards.

Results: During 6-months' study period, 3894 patients attended the outpatient Gynecology Clinic, from whom 326 women (8.24%) proved to have vaginal infections. The mean age (\pm SD) of the study participants was 34.61 ± 9.33 years. The majority of women (89.6%) were housewives, multipara (85.9%), living in rural and semi urban areas (79.5%). Among the study group, candidiasis was the most common type of infection (60.8%). The recurrence rate was high for both bacterial vaginosis "BV" (75.2%) and vulvovaginal candidiasis "VVC" (64.1%). No significant difference between candidiasis and bacterial vaginosis regarding preterm labor, ectopic pregnancy and pelvic inflammatory disease.

Conclusions: Vaginal infections are quiet common in our locality with high frequency of recurrence. Vaginal douching is a common practice that may predispose to many reproductive health hazards as preterm labor and pelvic inflammatory disease.

Keywords: Vaginitis, vaginal infection, bacterial vaginosis, vulvovaginal candidiasis.

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Introduction

The complaint of abnormal vaginal discharge (AVD) is very common particularly in developing countries with low socioeconomic level as Egypt. Vaginitis is usually characterized by abnormal vaginal discharge and or vulval itching and irritation. Bacterial vaginosis (BV) and vulvovaginal candidiasis (VVC) are responsible for the greater part of cases of infectious vaginitis⁽¹⁾.

BV is one of the most common causes of AVD in women of reproductive age⁽²⁾. It is also considered one of the most frequent diagnoses in women attending genitourinary clinics. As 50% of cases of BV are asymptomatic, the true prevalence of BV in the community is uncertain⁽³⁾. This condition is characterized by replacement of vaginal lactobacilli with predominantly anaerobic microorganisms such as *Gardnerella vaginalis*, *Prevotella*, *Peptostreptococcus* and *Bacteroides*⁽⁴⁾.

Multiple risk factors for BV infection have been hypothesized, including vaginal douching, African-American race⁽⁵⁾. Other risk factors include low socioeconomic status, cigarette smoking, antibiotic treatment for another condition, young age of coitarche, acquisition of a new sex partner and a recent history of multiple sex partners^(6,7). Inversely, hormonal contraceptive use, male circumcision, and consistent condom use reduce the incidence of BV^(8,9,10).

BV can be a cause for complications like post-partum endometritis⁽¹¹⁾, and decreased success of in vitro fertilization and embryo transfer⁽⁴⁾. In addition, BV probably increases risk for pelvic inflammatory disease (PID) and may be causative in some cases of abnormal uterine bleeding^(12,13). It can be also associated with postoperative infection and adverse pregnancy outcomes including late abortion⁽¹⁴⁾, premature rupture of the amniotic membranes, preterm labor, delivery of low-birth-weight infants and chorioamnionitis⁽¹⁵⁾.

VVC is a common infective cause of vaginal discharge that affects about 75% of women at some time during their reproductive life⁽¹⁾, with 5-10% of women develops four or more episodes of VVC per year⁽¹⁶⁾.

There are many risk factors can be associated with VVC. Those risk factors include mainly pregnancy⁽¹⁷⁾, use of broad-spectrum antibiotics⁽¹⁸⁾, uncontrolled diabetes mellitus⁽¹⁹⁾, use of contraceptives and hormone replacement therapy⁽²⁰⁾, use of corticosteroids⁽¹⁾, tight-fitting clothing, synthetic underwear, increase sexual activity and vaginal douching⁽²¹⁾. VVC if left untreated can lead to chorioamnionitis with consequent abortion and prematurity in pregnant women and PID resulting in infertility in non-pregnant women⁽²²⁾.

Trichomoniasis is a rare cause of vaginitis caused by a protozoan named *Trichomonas vaginalis*. In 2010, it was reported that prevalence of trichomoniasis was 1.4% among women⁽²³⁾. It can be associated with serious health consequences as delivery of low-birth-weight or premature infant, and increase chances of cervical cancer⁽²⁴⁾.

The risk factors for AVD are different in many settings due to difference in the socioeconomic level, personal hygiene and habits. The complaint is quite common in Egypt and we are looking for the risk factors for vaginal infections in our community that is why we performed the current study. The primary aim was to determine the frequency of occurrence of vaginal infections among Upper Egypt women with evaluation of the related risk factors and health hazards. In addition to study the habit of vaginal douching, its possible relation to vaginal infections.

Materials and Methods

This study was a cross sectional observational study conducted in Outpatient Gynecology Clinic of Assiut University Hospital, Egypt for 6 months between the 1st of May 2014 till the 31st of October 2014. All married women presented to the clinic and proved to have any type of vaginal infection after gynecological examination were invited to participate in the study. We excluded women who had vaginal bleeding and those who refused to participate in the study. Oral consent has been obtained from all participants. The study protocol had been approved by the Assiut Medical School Ethical Review Board.

The study included an interview-administered

questionnaire that was written in Arabic by the investigators. The final Arabic version was validated on eligible participants to determine whether it was acceptable, simple and readily understood. It consists of 24 short questions. The questionnaire was conducted by a trained nurse and asking about demographic characteristics, obstetric history, use of internal vaginal douching, contraceptive method, chronic diseases, history of vaginitis and history of occurrence of certain health hazards including; preterm labor, ectopic pregnancy, pelvic inflammatory disease.

The diagnosis of vulvovaginitis was defined in this way: BV was diagnosed if three of the following four criteria (Amsel's criteria) were present: vaginal pH ≥ 4.5 , presence of thin homogeneous discharge, positive whiff test, and presence of clue cells in the wet mount⁽²⁵⁾.

VVC was diagnosed by patient's history, clinical features (thick white odorless discharge), vaginal pH < 4.5 , and direct microscopy (wet mount with saline solution and potassium hydroxide)⁽²⁶⁾.

Trichomoniasis was suggested by clinical history and confirmed by finding the characteristic motile flagellates in the wet mount⁽²⁷⁾.

Analysis of data was done using the statistical package for social science (SPSS Inc., Chicago, version 18). Continuous variables were presented in terms of mean, standard deviation. Chi-square test was used to assess the significance of the difference between categorical variables. A $p < 0.05$ was considered statistically significant.

Results

During the designated study period, 3894 patients attended the outpatient Gynecology Clinic, from whom 326 women (8.24%) were suffering from AVD participated in the questionnaire. The mean age of study participants was 34.61 ± 9.33 years.

The majority of women (89.6%) were housewives and 85.9% of participants were multipara. In addition, most of women (79.5%) with abnormal vaginal discharge were living in rural and semi urban areas. Among the study group, 198 women (60.8%) were

diagnosed as having VVC, 121 women (37.1%) with BV and 7 women (2.1%) with trichomoniasis.

In our study, we found 54 patients (16.6%) out of the study participants having chronic diseases, 50% of them were diabetics and 12 patients (3.7%) had a history of intake of corticosteroids or immunosuppressive drugs.

Regarding current use of contraceptive method, 208 patients (63.8%) were non-contraceptive users and 118 patients (36.2%) were using various contraceptive methods. The majority of them (45.8%) were IUD users followed by 27.1% pills users, then 21.3% using progestin only injectables. When comparing patients in the study who had BV with those had VVC regarding the type of current contraceptive method, it was statistically insignificant ($P > 0.05$).

In our study, we found that 68.1% of patients were having a history of previous vulvovaginitis. Recurrence rate was high with BV more than VVC with statistical significant difference ($P < 0.05$). The relation between the type of vaginal infection and frequency of abnormal vaginal discharge was statistically significant ($P = 0.001$). Furthermore the highest possibility of recurrence in cases of BV (2-4 episodes per year) was seen among 41.3% of cases in comparison with 25.3% of patients having candidiasis which was statistically significant. *Trichomonas vaginalis* infection was omitted from the table to show the significance between the two common types of vaginal infection (Table 1).

Table 1. Risk factors and health hazards related to bacterial vaginosis and vulvovaginal candidiasis.

	Type of vaginitis				P
	Vulvovaginal candidiasis		Bacterial vaginosis		
	(n=198)		(n= 121)		
	N.	%	N.	%	
History of vaginitis	127	64.1	91	75.2	0.039
Frequency of abnormal vaginal discharge					0.001
Once a year	63	31.8	34	28.1	
2 - 4 times per year	50	25.3	50	41.3	
Once a month	68	34.3	21	17.4	
More than once a month	17	8.6	16	13.2	
Use of contraceptive method					0.203
Hormonal	40	20.2	17	14.0	
Non-hormonal	38	19.2	19	15.7	
None	120	60.6	85	70.2	
Reproductive heath hazards					
Preterm delivery	19	9.6	19	15.7	0.102
Ectopic pregnancy	4	2	0	0	0.291
History of PID	48	24.2	38	31.4	0.162
Diabetes mellitus	15	7.6	12	9.9	0.411

There was no significant difference between VVC and BV regarding the previous occurrence of health hazards related to vaginitis as preterm labor, ectopic pregnancy and PID.

In our study, we found that 69.9% of patients were performing internal vaginal douching. Table 2 demonstrates the possible reproductive hazards of vaginal douching; History of PID was significantly different between those who perform vaginal douching

32.5% versus 14.3% in non-performers ($P = 0.001$). There is no difference between both groups in the history of having ectopic pregnancy or preterm delivery ($P = 0.744$ and 0.362) respectively.

Table 2 also demonstrates the relation between performance of vaginal douching and history of previous vaginitis which was significant in performers ($P = 0.001$). However there were no difference between the two groups in the type of vaginal infection ($P = 0.394$).

Table 2. Relation between performance of vaginal douching, reproductive hazards, history of previous vaginitis and type of recent vaginitis.

	Vaginal douching				P
	Performers		Non-performers		
	(n= 228)		(n= 98)		
	N.	%	N.	%	
Reproductive health hazards					
Preterm delivery	29	12.7	9	9.2	0.362
Ectopic pregnancy	2	0.9	2	2.0	0.744
History of PID	74	32.5	14	14.3	0.001

Table 2. Relation between performance of vaginal douching, reproductive hazards, history of previous vaginitis and type of recent vaginitis. (Cont.)

	Vaginal douching				P
	Performers		Non-performers		
	(n= 228)		(n= 98)		
	N.	%	N.	%	
History of previous vaginitis	175	76.8	47	48.0	0.001
Type of recent vaginitis					0.394
Vulvovaginal candidiasis	133	58.3	65	66.3	
Bacterial vaginosis	90	39.5	31	31.6	
Trichomoniasis	5	2.2	2	2.0	

Discussion

Abnormal vaginal discharge is one of the most distressing problems daily faced by the gynecologist. The current study was a cross sectional study evaluating AVD and its common predisposing factors, different types of vulvovaginal infection and possible common reproductive hazards. Furthermore, the study discussed the common habit of vaginal douching, its possible relation to abnormal vaginal discharge and common risk factors.

As regards to the cause of vaginitis, we found that VVC was the most common cause of vaginitis in our locality; it represented 60.8% while BV represented 37.1% of the studied population. BV prevalence is in agreement with the same reported range by Morris et al (4.9-36%) in the UK⁽²⁾, and by Eckert (15-50%) in USA⁽²⁸⁾. However, VVC prevalence was higher than what was reported by Eckert that was 20-25%⁽²⁸⁾. Furthermore, VVC was the second most commonly diagnosed vaginitis in the United States⁽²⁹⁾. This controversy can be explained by the fact that about most of women with BV are asymptomatic. In addition, the hot humid weather in Egypt may participate in increasing prevalence of VVC as the study patients were recruited during summer.

Recurrent vulvovaginal infection represented about 68.1% of our studied population, which is considered high. VVC is a frequent and common distressing problem affecting about 70%-75% of women in the childbearing age at least once in their lifetime⁽³⁰⁾.

In a 12 months cohort study, by Bradshaw and colleagues, they reported a median recurrence rate of BV of 58% after treatment with metronidazole⁽³¹⁾. This can be explained by the habit of VD which is about 69.9% almost the same figure as our study. In addition, most women with AVD depend mainly on their own experience for self treatment which may miss different causes of vaginal infection or mixed types and finally lack of treatment of co-infected husband may be an attributable factor.

Reproductive health hazards are common complications of vulvovaginal infections. We found that 31.4% of cases with BV had a history of PID at some time in their life; this coincides with other studies^(12,32). BV probably is a risk for PID. However, a cohort study in USA found no overall increased risk of developing PID among women with BV⁽³³⁾.

Our study showed that 15.7% of the studied women with BV have a history of preterm labor. Meta-analysis including eighteen studies with results for 20,232 patients found that BV doubles the risk of preterm delivery⁽³⁴⁾.

Vaginal douching is usually done for cleanliness, odor control, or relief of vaginal itching and irritation⁽³⁵⁾. It is a prevalent habit in a big sector of women regardless of their social or cultural level. In our study, 69.9% of the studied population was performing VD. This is in accordance with previous study in the same setting states that 73% of women with vaginal infection perform vaginal douching, which is much more than what was

reported in the United States National Survey on Family Growth 2002. The survey showed that 32% of women practiced douching in the prior 12 months. Another study held in Eskisehir in Turkey observed that 47.7% of the women had practiced VD at any part of their lives⁽³⁶⁾.

Our study showed that the history of PID was common in vaginal douching performers more than non-performers; 32.5% versus 14.3%, which is statistically significant. These results coincide with previous study in the same setting that delineated that the incidence of PID was 45% of douching performers compared to 22% of non-performers⁽³⁷⁾. Meta-analysis of published studies from 1965 to 1995 did prove that vaginal douching increased the risk for PID by 73%⁽³⁸⁾. This has been further confirmed by more recent RCT in 2005 by Ness and colleagues⁽¹²⁾. These results let the CDC to put an obligation to commercial douche boxes to contain warnings about the association between vaginal douching and PID.

In the current study, history of preterm delivery represented 12.7% among vaginal douching performers compared with 9.2% among non-performers, which is not significant. This contradicts another study in the same center, that states that there is a significant risk of preterm delivery among vaginal douching users⁽³⁷⁾ as well as other studies like what was done at Johns Hopkins, USA⁽³⁹⁾. This controversy may be attributed to small sampling. Furthermore, we studied women with AVD not with BV that has established relation with preterm birth. Moreover, these results were not compared to a control group without vaginal discharge. There were some limitations that faced us in this study, as it did not cover all possible health hazards of vulvovaginal infection including post partum endometritis, recurrent abortions, premature rupture of membranes and chorioamnionitis. Another problem was the possibility of recall bias as, history of reproductive health hazards were mainly depending on what the woman remembered.

In conclusion, vaginal infections are quiet common in our locality with high frequency of recurrence. Vaginal douching is a common practice that may predispose to many reproductive health

hazards as PID.

Conflict of Interest

The authors declare that they have no conflict of interest.

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