



Original Research Article

Prevalence of Vaginal Infection and Associated Risk Health Behaviors Among Married Women in Ismailia City

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ABSTRACT

Vaginal infection is recognized as a major public health problem that causes a variety of problems for women at all ages. This study aimed to evaluate health behaviors that are associated with vaginal infections among married women in Ismailia, Egypt. Descriptive study was conducted from January to July 2012 on 360 married women at reproductive age from 18- 44 years from eight governmental rural & urban primary health care centers in Ismailia to represent the geographical zones. Vaginal swabs were taken from each woman for microbiological analysis. The study revealed that the prevalence of vaginal infection was 93.6% while 84.3% of cases have recurrent vaginal infection. All of the samples have bacterial vaginal infection while 11.3% have *Candida albicans* & 3.9% have *Trichomoniasis vaginalis*. The majority of the infected woman had unsatisfactory level of health behavior, with only 17.0% of them had satisfactory level. We concluded that the married women attending PHC centers in Ismailia city suffer from high prevalence of bacterial vaginal infection with high level of recurrence as well as the unsatisfactory level of health behaviors among them.

Keywords

Vaginal infection, Health behaviors, Married women and Ismailia

Introduction

Vaginal infection is a part of reproductive tract infection (RTI), as it is recognized as a major public health problem that causes a variety of problems for women at different ages (Murray and Mckinney, 2010). Vaginitis is caused by an alteration in the

normal vaginal defense mechanisms such as vaginal flora (lactobacilli), vaginal pH, and vaginal squamous epithelium layer (Schorge *et al.*, 2008).

There are two major types of vaginitis, whether infectious or non infectious

vaginitis. For non infectious vaginitis, it is caused due to different causes such as: allergy to underclothes, feminine hygiene products, vaginal douches, spermicidal and occupational exposure. Irritation due to tampons, sanitary napkins, panty liners, hormonal causes as hypoestrogenism and iatrogenic causes as in intra uterine device (IUD), pessaries, and using chemical products. Finally, traumatic by foreign body inserted into the vagina, and contact dermatitis of the vulva caused by friction from pants, restricted presses jeans... etc(Ramirez-Santos *et al.*, 2007 and VHO, 2011).

While infectious vaginitis which accounts for 90% of all cases of vaginal infections at the reproductive age women and it's caused by one or more of the following organisms: by *Candida albicans* (*C. albicans*) as a yeast, Bacterial vaginosis (BV) caused by *Gardnerella vaginalis* (*G. vaginalis*) as bacteria, and *Trichomonas vaginalis* (*T. vaginalis*) as protozoa (Schnatz and Miranda, 2011).

Infection is more likely caused due to reduced acidity either endogenously by hormones or exogenously by vaginal unhygienic practices as the mal-use of soaps or douche, poor menstrual hygiene, and tissue damage, in addition, to the personal unhygienic behaviors such as swimming in polluted water, or using contaminated towels, and using irritating and tight non-absorbent underwear (Porter *et la.*, 2010 and ASHA, 2013).

The recurrence of vaginal infection is defined by four or more episodes of infection in a year. This is due to bad personal hygiene practices such as vaginal douching that disrupt the normal vaginal flora and re-infection from an untreated partner. Moreover, the self diagnosis and the

self treatment by women from vaginal infection episodes without confirmation of infection by microbiological tests (Berek *et al.*, 2007).

The American social health association (ASHA, 2013) reported that 70% of women are self-treated from vaginal infections before seeking a health care provider. Usually, they incorrectly thought they have a yeast infection while in fact it was BV. So, it is important to confirm the diagnosis through microbiological tests and full sexual health screen to exclude concurrent infection (Mitchell, 2004 and Schnatz and Miranda, 2011).

The primary role of the nurse in managing vaginal infections is to provide health education in order to modify the health behaviors and to prevent the occurrence as well as recurrence of vaginal infections (Ricciand Kyle, 2009).

The aim of the study was to evaluate health behaviors that are associated with vaginal infections among married women in Ismailia, Egypt.

Materials and Methods

Our study is a descriptive study conducted in eight governmental health setting including gynecological and family planning clinics in primary health care (PHC) centers at Ismailia city from January to July 2012 on 360 married women with an age range from 18to 44 years.

Every woman in the study was vaginally examined to measure the vaginal *pH* by using *pH* 0.7 purchased from Merck KGaA, Darmstadt, Germany, through rubbing the *pH* paper along the lateral and posterior wall of the vagina to collect some discharge and clarify *pH*. Also two vaginal swabs were

taken from the posterior vaginal fornix under aseptic technique and were subcultured onto Macconkey, Blood Agar Plate (BAP) and Sabouraud agar (Fiebig, (2009). The involved stains were gram, giemsa and Leishman stains.

Whiff test was performed to differentiate between *C. albicans* from other species by using KOH, if there was strong fishy odor this indicated of BV, in addition to the wet mount technique to test the motility of trichomoniasis (Cappuccino and Sherman, 2005). Catalase, coagulase and germ tube tests were performed.

To identify *Gardnerella*, samples were incubated under 5 – 10% carbon dioxide, after 48 hours colonies appeared very small (1mm), glistening 'dew- drops' with Beta haemolytic on BAP. By making lawns on two plates of BAP, on one plate a drop of 3% H₂O₂ was added and to another a disc of trimethoprim was added. *Gardnerella* were inhibited by H₂O₂ and sensitive to trimethoprim (Cheesbrough, 2006).

Data entry and analysis were done using SPSS 20.0 (statistical packages for social science). Quality control was done at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations for quantitative variables. Qualitative variables were compared using non parametric chi-square test. Statistical significance was considered at *p*-value <0.05.

Result and Discussion

This study was conducted on 360 married women; their mean age was 29.97 ± 6.450 SD (standard deviation). Half of them had

secondary education with high percentage being house wives living in rural areas

One quarter of the married women had low satisfactory socio- economic standard as shown in table 1.

For the obstetrical, gynecological and family planning history of the sample study, table 2 showed three quarters of them their number of parity was less than three times. Three quarters of the women didn't abort, more than half of them delivered normally, two third of the women used contraceptive methods and more than half of them used IUD as a way of contraception.

Figure 1, 2, & 3 showed that 93.6% of the women were infected with the following organisms respectively *E. coli* (29.7%), *Klebsiella* (22.8%), *S. aureus* (18.4%), *Streptococcus* (15.4%), *Proteus* (5.6%), *G. vaginalis* (9.2%) *C. albicans* (11.3%) and *T. vaginalis* (3.9%).

Table 3 and figure 3 showed that 85.5% of the cases had recurrence with a rate of three times/year, 12.3% were new cases and 2.2% were never infected.

Table 4 and figure 4 showed the bad personnel hygiene and behaviors among the studied population.

For the relationship between previous treatment and vaginal infection, table 5 showed that less than two third of infected women had a regimen of treatment and more than one quarter of spouses were receiving treatment with their wives.

Vaginal infection is considered one of the major feminine health problems (Gooch *et al.*, 2011) from time to time during their reproductive lives due to its strong relationship with the menstrual cycles, birth

control methods, aging, medicines, or changes after pregnancy (AANP, 2010).

Regarding the effect of the socio-demographic factors on the occurrence of vaginal infections, this study describe that infection occurs at all ages especially at the age range from 21 to 39 years old which is similar to that reported with Bahram *et al.* (2009) that the difficulty in distinguishing for the age distribution patterns of vaginal infections due to various behavioral, physiological and immunological variable interactions.

For the socio-economic standards, we found that almost half of the vaginally infected ladies suffer from unsatisfactory socio-economic standards that implicate the role of socio-economic standards in the causation of vaginal infections as the majority of women were below the average in the level of nutritional status which could be correlated to the low social standards. Because the healthy diet and the good nutritional status help the body to fight against infection, to resist against the colonization of bacteria and encourage the success of the medical treatment (Glenville, 2012 and ASHA, 2013).

For the usage of contraceptive methods, we found that more than one third of infected ladies did not use contraceptive methods and more than half of users were IUD users. Pant *et al.*, results were closer to ours as he denoted that vaginally infected women were user of IUD and aggravate also the symptoms due to the unhealthy hygiene performed by them. So far for the gravidity, we found that two third of the infected women had less than three times gravid and more than one fifth of infected women aborted less than three times, these results were in coherent to Li *et al.*, who stated that less than three quarters of the vaginally

infected women aborted from one to two times and explained the hormonal changes during pregnancy as well as the usage of invasive procedure during labor and abortion would increase the risk for infections.

For the rate of vaginal infection, it was clear from our study that the great majority of the studied population suffered from vaginal infection with high incidence than those reported with Pant *et al.* (2008) due to the small sample size as comparison in their study as compared to our. Moreover, the incidence of previous recurrent infection was high in level in our study as the cause of the recurrence of infection is due to the re-infection from an untreated partner, the mal-compliance to treatment and the empirical use of treatment without medical advice (CDC, 2013).

On the other side, we found that the causative organisms were *E. coli* in less than one-third of cases followed by *Klebsilla* less than one quarter, *staph. aureus* less than one-fifth as with Mumtaz *et al.* (2008). While, *Candida* infection represented more than 10%, *G. vaginalis* 10%, more than 5% were *Proteus* and less than 5% for *Trichomoniasis* infection. These findings are different to those of Khan *et al.* due to strict religious and cultural believes which prohibits illegal sexual relationships.

Regarding the heath behaviors, it was evident from our work that the majority of infected women didn't change their under-wears daily also, half of the infected wives didn't cut their nail frequently as fingernails are considered to be one of the most common areas affected by fungal and bacterial infections and can be transferred it into vagina during vaginal washing (Sheary and Dayan, 2005). Also, it was evident from our work that the prevalence of vaginal

infection was significantly high, whereas the majority of infected women had unsatisfactory health behaviors which agree with those conducted by Bahram *et al.* (2009) The current study showed that the majority of the infected ladies was previously treated whereas more than one third of them didn't take prescribed medication with regimen. The combination of unhygienic vaginal practices with the empirical treatment without bacteriological

identification of the causative microorganism lead to temporarily relieving the symptoms, then repeating the treatment from herself without seeking medical advice and or finally stopping the treatment due to the feeling of discomfort. In addition, the poverty and the low socio- economic standards play a major role on the ability of buying medications and relieving symptoms of infection (Patel *et al.*, 2003).

Table.1 Distribution of the married women according to their socio-demographic data according to scale for socioeconomic status (n=360) [14]

Items	Frequency	%
Age/ years		
<20	10	2.8
20	169	46.9
30	140	38.9
40<45	41	11.4
Mean ± SD		29.97 ± 6.450
Educational level		
Can't Read and writes	58	16.1
Reads and writes	34	9.4
Primary education	44	12.2
Secondary education	176	48.9
High education	48	13.3
Occupation		
House wife (H.W)	291	80.8
Working	69	19.2
Residence		
Urban	153	42.5
Rural	207	57.5
Socio- economic standard*		
Highly satisfactory	50	13.9
Satisfactory	142	39.4
Low satisfactory	82	22.8
Not satisfactory	86	23.9
Duration of marriage		
< 1year	19	5.3
1-5 years	109	30.3
>5 years	232	64.4

Table.2 Distribution of the married women according to their obstetric and gynecological history (n=360)

Items	Frequency	%
Gravida (n=360)		
Null- gravida	18	5.0
< 3	242	67.2
3-6	87	24.2
>6	13	3.6
Number of abortion (n=360)		
Non	266	73.9
< 3	88	24.4
3-6	5	1.4
>6	1	0.3
Mode of delivery (n=337)		
Normal	195	54.2
C.S	100	27.8
Two type	42	11.7
Previous Gynecological operations		
No	290	80.6
Yes	70	19.4
Vaginal infection followed gynecological operations (n=70)		
No	43	61.4
Yes	27	38.6
Gynecological Examination		
No	97	26.9
Yes	263	73.1
Vaginal infection followed gynecological Examination (n=263)		
No	96	26.9
Yes	154	42.8
Already present	13	3.6
Contraceptives use		
Non user	33.9	33.9
User	238	66.1
Contraceptive methods (n=238)		
Natural methods	7	2.9
Condom	2	0.8
IUD	137	57.6
Mini pills	40	16.8
Depot provera	43	18.1
Levonorgestrel	7	2.9

C.S = Cesarean section, IUD = intra uterine device

Table.3 Distribution of the recurrent cases according to their frequency of recurrence of vaginal infection (n=352)

Items	Past infected		Infected		X ²	P value
	No.	%	No.	%		
Recurrence of vaginal Infection						
New cases	0	0	44	13.1	50.442	0.000*
Recurrent cases	15	100	293	86.9		
Mode of recurrence						
One time/year	1	6.7	18	6.1	0.247	0.884
Two-three times/year	2	13.3	28	9.6		
□ Three times/year	12	80	247	84.3		

Table.4 Distribution of the infected women according to their personal hygiene (n=337)

Personal hygienic practices	Yes		No		X ²	P value
	No.	%	No.	%		
Didn't use public water cycle (WC)	110	32.6	227	67.4	40.620	0.000*
Didn't use Daily perineal pad	39	10.8	298	89.2	199.053	0.000*
Changing underwear daily	73	21.7	264	78.3	110.531	0.000*
Use cotton underwear	127	37.7	210	62.3	20.442	0.000*
Boil underwear and pads	40	11.9	297	88.1	195.991	0.000*
Hang under wear in sun rays	268	79.5	69	20.5	117.510	0.000**
Cut Nail frequently	164	48.7	173	51.3	0.240	0.624
Total	59	17.5	278	82.5	142.318	0.000*

(X²) = Chi square significance test

(*) =Statistical significance between mal practices and vaginal infection at p<0.05

(**) =Statistical significance between performance and vaginal infection at p<0.05

Table.5 Relationship between vaginal infection and compliance pattern to previous treatment variables (n=337)

Compliance to the medication	Infected cases (n=337)		X ²	P value
	No	%		
Previously treated (n=337)				
Yes	281	83.4	144.929	0.000*
No	56	16.6		
Use the prescribed medication (n=281)				
Yes	176	63.1	17.940	0.030*
No	105	36.9		
Use Other modalities without medical advice (n =93)				
Medication without medical prescription	55	16.3	14.129	0.001*
Home remedies	52	15.4		
Person who advice				
Relatives	74	78.7		
Pharmacist	17	18.1		
Nurse	10	10.6		
Treatment prescribed for spouse (n =281)				
Yes	72	Yes 72 25.6	66.794	0.000*
No	209	74.4		
Spouse use the prescribed medication (n =72)				
Yes	50	69.4	10.889	0.001*
No	22	30.6		

(X2) = Chi square significance test

(*) =Statistical significance at p<0.05

The total number of advisement not equal 100% because the of double sources of advisements

Figure.1 Distribution of the married women according to the rate of their vaginal infection (n = 360)

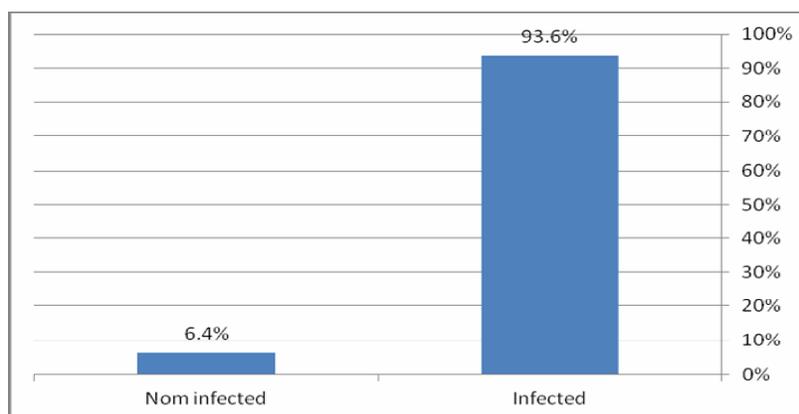


Figure.2 Distribution of the married women according to the recurrence of vaginal infection (n=360)

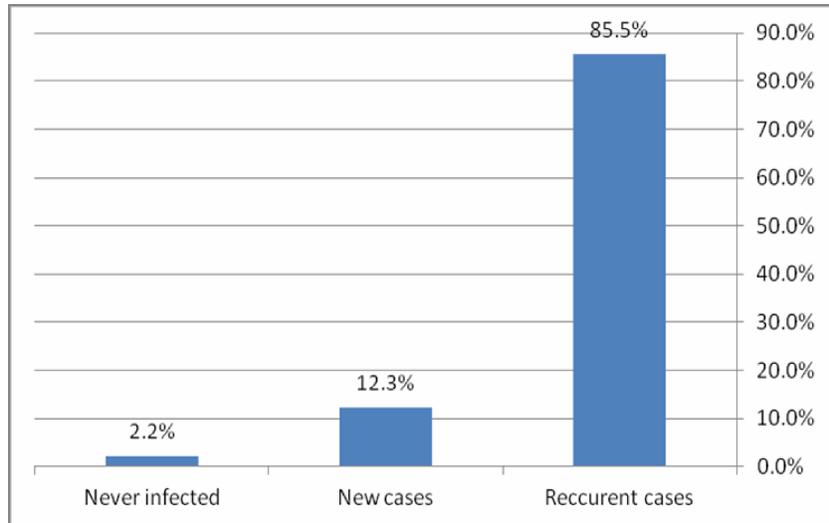
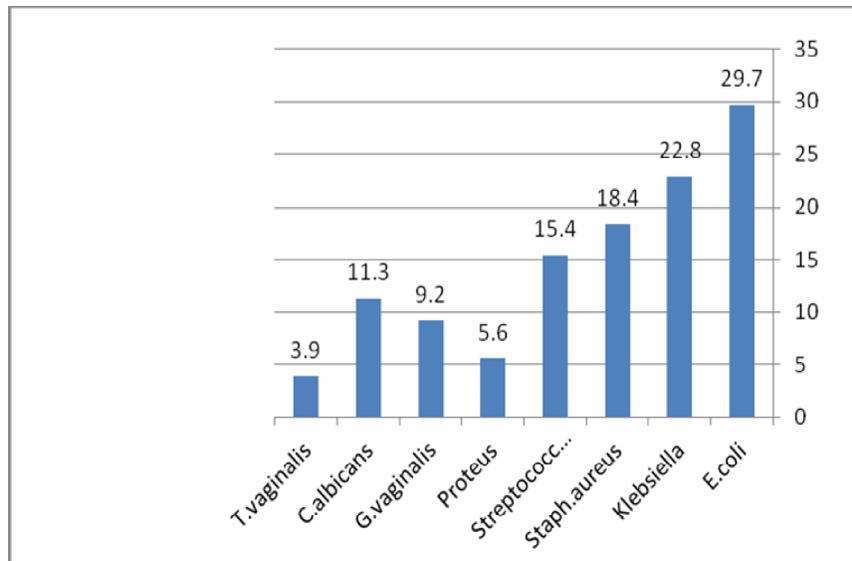


Figure.3 The causative organisms regarding the microbiological analysis (n=337)



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