

Urinary tract infection in vaginitis: a condition often overlooked

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ABSTRACT

Despite the differences between the organisms that cause vaginitis and urinary tract infections (UTI), it is possible that women with vaginitis develop UTI. The main objective of the study was to find the association of the common types of infectious vaginitis with UTI. Cross sectional study was conducted for six months in a referral hospital at Lalitpur, Nepal. Three hundred and six mid-stream urine samples and high vaginal swabs (HVS) collected from non pregnant women were investigated by standard microbiological techniques. Among the women with bacterial vaginosis (BV), 75% also had UTI. Similarly, 46% and 13% of those with vaginal candidiasis and trichomoniasis respectively had concurrent UTI. Considering this strong association of UTI and vaginitis, women with either of these conditions should be tested for the other.

Keywords: Urinary tract infection, bacterial vaginosis, vaginal candidiasis, trichomoniasis, vaginitis.

INTRODUCTION

Vaginal symptoms are one of the most common reasons for gynecological consultation.¹ The three most common causes of vaginitis in premenopausal women are vaginal Candidiasis, Bacterial Vaginosis and Trichomoniasis.² Although most women with acute vaginitis assume that *Candida* is the cause, this is true in only 15 to 30% of cases. Most cases of acute vulvovaginal candidiasis are caused by *C. albicans*.³ *Trichomonas vaginalis* is the causative agent of Trichomoniasis, a common cause of vaginitis. Bacterial vaginosis (BV) is a clinical syndrome resulting from a change in the normal vaginal flora. The etiology of BV is complex and the commonly associated organisms include *Gardnerella vaginalis*, *Mycoplasma hominis*, *Mobiluncus* species and anaerobic Gram negative rods and Gram positive cocci.⁴ The different risk factors associated with BV are multiple sex partners,⁵ intrauterine device usages,⁶ smoking⁷ etc.

UTI simply refers to the presence of bacteria undergoing multiplication in urine within the urinary drainage system and presence of more than 10⁵ organisms/ml in the mid-stream sample of urine.⁸

An increased vaginal fluid pH has been associated with more frequent colonization with uropathogens. One cause of increased vaginal fluid pH in sexually active young women is BV.⁹ Considering the remarkable difference between the organisms that cause BV and UTI, it is possible that women with BV developed UTI because of frequent sexual intercourse.¹⁰

MATERIALS AND METHODS

A total of 306 non pregnant women with complaints of vaginal discharge and attending the gynaecology and obstetrics OPD were included in the study. After an informed consent and a detailed questionnaire, mid-stream urine samples and high vaginal swabs were collected. The urine was collected in a wide-necked sterile container while the swabs were collected from the posterior fornix by the examining gynaecologist. The urine samples were subjected to standard bacterial culture on MacConkey agar and Blood agar plates using flame sterilized nichrome wire loop (internal diameter of 4mm holding 0.01ml). The plates were observed for bacterial growth after 24 hours of aerobic incubation at 37°C. Bacterial colonies more than 10⁵ colony forming units (CFU) per ml of urine were considered significant. The bacteria were identified by colony characteristics, Gram's reaction and biochemical properties. These were subjected to antibiotic susceptibility testing by Kirby-Bauer's disc diffusion method. The HVS were subjected to wet mount for detection of motile *Trichomonas* spp. Gram stained smear was used for diagnosis of vaginal candidiasis and Nugent's scoring for BV. Three of four criteria of Amsel et al (pH greater than 4.5, homogeneous grayish adherent discharge, fishy odor due to release of amines when 10% potassium hydroxide solution is added to the discharge, and clue cells on a saline wet mount, representing at least 20% of the epithelial cells) and Nugent's score were considered for the diagnosis of BV. Data were analyzed by SPSS version 13.

RESULTS

Among the 306 high vaginal swab samples, 166 (54.25%) had vaginitis. UTIs were found in 189 (61.8%) of the women. Out of these, 149 (79%) had symptomatic UTI.

Of the 135 BV positive cases, 101 (75%) had associated UTI. Only 87 (64%) of these had symptoms of UTI. The association of UTI with BV was statistically significant ($p < 0.05$) Table-1.

Table-1: Association of BV with UTI

BV	UTI			P-value
	Positive	Negative	Total	
Positive	101	34	135	0.000
Negative	88	83	171	
Total	189	117	306	

Among the 37 *Candida* positive cases, 17 (46%) had associated UTI with 8 (22%) being symptomatic. The association was statistically significant ($p < 0.05$) Table-2.

Table-2: Association of vaginal candidiasis with UTI

Vaginal Candidiasis	UTI			P-value
	Positive	Negative	Total	
Positive	17	20	37	0.035
Negative	172	97	269	
Total	189	117	306	

Of the 8 *T.vaginalis* positive cases, only 1 (12.5%) had associated symptomatic UTI. The association was statistically significant ($p < 0.05$) Table-3.

Table-3: Association of Trichomoniasis with UTI

Trichomoniasis	UTI			P-value
	Positive	Negative	Total	
Positive	1	7	8	0.004
Negative	188	110	298	
Total	189	117	306	

DISCUSSION

From the present study a strong association of UTI with vaginitis was established. Although around 79% of those with UTI had some symptoms of the infection, the rest were asymptomatic. Of the 135 women with BV, 75% also had significant bacteriuria although only 64% of them were symptomatic for UTI. A study from South India trying to establish the relationship of UTI and BV revealed 42.27% of pregnant and 50% of the non pregnant women with BV also had UTI. Once the difference in pregnancy status was taken into account, women with BV had odds of experiencing UTI 13.75

times more than those without.¹¹ In a different study, a lower (22.4%) percentage of women with BV had concurrent UTI. However, only 9.7% of the group without BV had UTI.¹⁰ Similarly, other investigators¹² have also concluded from their study on pregnant women that BV in pregnancy increased the risk of UTI.

Although anatomical proximity allows easy transfer of *G. vaginalis* from the genital tract to the urinary tract but to date only a few investigators have examined the role of *G. vaginalis* which is a potent cause of BV, in UTI and renal disease. The leading uropathogen isolated from these women in all the reported studies including the present study was *Escherichia coli*.^{13,14}

A significant association of UTI with vaginal candidiasis and trichomoniasis was also revealed from this study. The published literature was lacking in studies investigating their relationship.

The association of BV with UTI probably begins with an increase in the pH of the vagina because of the reduction in the vaginal lactobacilli.¹¹ The lactic acid and hydrogen peroxide produced by lactobacilli are toxic to a number of bacterial species and have been demonstrated to inhibit potential pathogens. In addition, a number of bacteriocins produced by lactobacilli have been described that are active against a wide range of bacteria and fungi. So, once the ecology of vagina is disturbed during BV, allowing colonization of potential uropathogens, the patient becomes more susceptible to UTI.¹⁵

The increased frequency of coitus per week was found to be a common risk factor for both the UTI and vaginitis. The exogenous factor in semen that create an imbalance in vaginal microflora facilitate development of BV.¹⁶ The urethral massage during the sexual activity has a facilitating role in moving the urethral colonizers into the bladder. Besides the effect of BV and sexual activity on the acquisition of UTI, the differences in the living standards, socio-cultural practices, personal hygiene, education and awareness of the individual may be the reasons for the differences seen in the incidence of UTI in vaginitis in different communities.

Thus, it might be wise and cost effective (considering the complications associated with untreated BV and UTI), to test for UTI in women with infectious vaginitis and vice versa. Further studies are required to establish the association of UTI with all the three major types of infectious vaginitis in both pregnant and non pregnant women, to find the time sequence of events and to establish the causal or incidental effect of frequency of sexual activity on these.

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