

## **Evaluation the effect of different factors on urogenital infection and the associations between urinary tract infection and vaginitis .**

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### **Abstract**

The study aimed to evaluate different factors on urogenital infections whether was fungal or bacterial and the association between urinary tract infection and vaginitis. The result showed that the incidence of urogenital infections revealed detectable increase among women using contraceptive pills or intrauterine contraceptive device, diabetic and pregnant women as well as women using douching to prevent pregnancy and among women using spermicide as a mean of contraception. The results of the associations between urinary tract infection and vaginitis revealed that women with vaginitis had an increased risk of urinary tract infections.

### **Introduction**

In the adult female, urogenital infection is the most common reason for seeking medical attention (1). Most women will experience some form of urogenital infection at least once in their lives (2), also this infection is one of the major causes of gynecologic morbidity such as infertility, ectopic pregnancy, preterm labor and chronic pelvic pain (3). The vagina and its unique microflora form a finely balanced ecosystem with the vaginal environment controlling the microbial types present and the microflora in turn controlling the vaginal environment (4). This ecosystem is dynamic with changes in structure and composition being influenced by age, time in the menstrual cycle, pregnancy, infections, methods of birth control as well as various habits and practices such as douching (5). This study was designed to evaluate different effective factors on the urogenital infection and estimate the association between urinary tract infection and vaginitis.

## **Materials and Methods**

Vaginal swabs and urine samples were randomly collected from 250 female patients who attended the obstetric and gynecology clinics in Baghdad during a period from the beginning of July 2006 to the end of March 2007. The age of the patients ranged between 19-67 years (mean age 38 years). Twenty five vaginal swabs and urine samples were collected from healthy women using sterile speculum and swabs as a control. The patients were classified as below:

Patient suffering from urogenital tract infection: 90 (36%).

Pregnant: 75 (30%).

Family planning patients: 50 (20%).

Other cases: 35 (14%).

The clinical diagnosis was done by the gynecologist. Those who have urogenital tract infection diagnosed by having badsmelly vaginal discharge with itching, irritation, soreness, burning micturition and lower abdominal pain. Other patients were pregnant with anemia, urinary tract infection, bleeding or other complication of pregnancy.

Some of the patients were admitted to the obstetric and gynecology clinic for a suitable contraception method.

The last group examined includes those suffering from other diseases such as urinary tract infection, nephritis, cervical carcinoma, bleeding, amenorrhea, dysmenorrhea or infertility. For each patient a case sheet was prepared including the following informations: age, hygienic condition, hygienic habits, and contraception method, present and past medical history (diseases and treatments).

### **Isolation and identification of pathogenic microorganisms:**

#### **Vaginal swabs:**

Two vaginal swabs for each patient were transported to the laboratory by inoculating the swab into a sterile tube containing 3.0 ml of saturate transport medium (Sabourauds dextrose broth or Brain heart infusion broth).

One of the swabs was directly inoculated onto Sabourauds dextrose agar, Blood agar, MacConkey agar for microbiological investigation, the other swab was used for direct examination by wet mounted film and Gram stained for detection of yeasts and bacteria. Inoculated culture plates were incubated for 24-72 hrs. The isolated colonies were identified by morphological feature, biochemical tests beside motility test.

Collection of urine sample and urine microscopical examination were done according to (6).

- Urine culture was performed according to (7) .

**- Identification of yeasts:**

The isolated yeasts were identified as described by (8) via Gram stain, production of chlamydospores, production of germ tube, biochemical tests included sugar fermentation test and carbohydrate assimilation test.

**- Identification of bacteria:**

The isolated bacteria were identified according to (9) by Gram stain and biochemical tests included oxidase, indole, catalase, urea hydrolysis, gelatinase, kiliglar iron agar, coagulase, phenylalanine deaminase, motility and Whiff test.

### **Results and discussion**

*Candida albicans* was identified from 63(32.81%) of the total vaginal swabs followed by *Staphylococcus aureus* 31(16.14% ), then *Escherichia coli* 21(10.93%), while *Pseudomonas aeruginosa* 18(9.37%), *Klebsiella oxytoca* 11(5.72%), *Gardnerella vaginalis* 10(5.20% ), *Proteus mirabilis* 6(3.12%) and mixed infection (*Candida* & bacteria) 24(12.5%) of the cases as shown in (table, 1).

**Table (1):** The percentage of different pathogens from vaginal swabs with control.

Microorganism	NO.of patientes	%	control	%
<i>Candida albicans</i>	63	32.81	9	42
<i>Staph.aureus</i>	31	16.14	2	9.5
<i>E.coli</i>	21	10.93	3	14.2
<i>P. aeruginosa</i>	18	9.37	2	9.5
<i>Klebsiella oxytoca</i>	11	5.72	0	0
<i>G.viginals</i>	10	5.20	2	9.5
<i>Proteus mirabilis</i>	6	3.12	3	14.2
Mixed infection	24	12.5	0	0
Total	192	100	21	100
Total Sample	250		25	

From the urine samples examined showed that *E. coli* was the common pathogen constitute 61(26.29%) followed by *Staph. aureus* 56(24.13%), *C. albicans* 48(20.68%), *P. aeruginosa* 23(9.91%), *G. vaginalis* 10(4.31%), *K. oxytoca* 7(3.01%), *Proteus mirabilis* 6(2.58%) and mixed infection 21(9.05%) as shown in (table, 2). These results comes in accordance with (10; 11) who found that all the above pathogens were highly present in female urogenital tract.

**Table (2):** The percentage of different pathogens from urine samples with control.

Microorganism	NO.of isolates	%	control	%
<i>E. coli</i>	61	26.29	3	15.7
<i>Staph. Aureus</i>	56	24.13	3	15.7
<i>Candida</i>	48	20.68	7	36.8
<i>G. vaginalis</i>	10	4.31	0	0
<i>P. aeruginosa</i>	23	9.91	4	21
<i>Klebsiella oxytoca</i>	7	3.01	0	0
<i>Proteus mirabilis</i>	6	2.58	2	10.5
Mixed infection	21	9.05	0	0
Total	232	100	19	100
Total Sample	250		25	

(Table, 3) summarizes the results of different factors effective on urogenital infection including pregnancy, the use of contraceptive pill, use loop (intrauterine device), diseases and administration of antibiotics, vaginal douching (internal vaginal washing), diabetes, using diaphragms and spermicidal .

**Table (3):** different factors effective on urogenital infection.

The factor	Candida-vaginal swab	Candida Urine sample	Bacteria vaginal swab	Bacteria Urine sample
pregnancy	14	14	18	17
Use contraceptive pill	20	12	0	0
Use loop	8	8	11	27
Diseases & administration of antibiotics	8	8	29	48
Vaginal douching	12	0	13	20
Diabetes	9	18	7	11
Spermicide	0	28	0	0
Total	71	88	78	113

In the current study candidal and bacterial vaginitis were common among pregnant women because during pregnancy the glycogen content increases in the vaginal epithelium which results in very favorable conditions for acid-tolerant bacteria and fungus, whereas following delivery, a substantial increase in the number of Candida and anaerobic bacteria such as gram negative rods were observed (12; 13; 14; 15).

The results showed that the incidence of vaginal candidiasis revealed detectable increase among women using contraceptive pill than those not using such pills, while bacterial vaginitis, revealed detectable increase among women using loop (intrauterine device). A phenomenon which has been observed by many investigators (16; 17; 18; 19), this could be explained due to two factors: The first, the contraceptive pill cause thickening of the vaginal epithelium due to deposition of glycogen which then fermented to lactic acid, thus lowering vaginal pH, favoring the growth of yeasts (20; 21; 22).

The second, use of contraceptive pill cause increase in circulating blood sugar and decrease the serum free insulin which might enhance the production of germ tube by *C. albicans* or might increase the pathogenicity of yeasts present in vagina (23; 24). While bacterial vaginitis, increase among women using loop which can be explained by the irritation that caused by loop and contamination in the area of intrauterine device (25; 26).

Another factor shown to affect urogenital infections is diseases and the administration of antibiotics and antimicrobial agents commonly used in the treatment of throat, respiratory, intestinal and urinary tract infections as well as in the prophylactic of inhibiting the growth of uropathogens in most cases. Some antibiotics have been shown to adversely affect the urogenital micro flora thereby facilitating increased vaginal colonization with uropathogens such as *E. coli* or *Candida* spp. (27; 28).

Urogenital infections also shown to be affected by the use of douching to prevent pregnancy or treat infection because the increased pH leads to decrease the number of *Lactobacilli* and an increase in facultative and obligate anaerobic gram positive cocci (29; 30). Women using spermicide as a mean of contraception have been shown to have an increased risk of acquiring urinary tract infections because many spermicides contain nonoxynol-9, a nonionic detergent which in addition to its spermicidal activity has antibacterial activity against several sexually transmitted bacteria (31; 32), and has been shown to negatively affect the composition of the urogenital micro flora by inhibits the growth of *Lactobacilli* (33).

The prevalence of infection in women suffering from diabetes was higher from those women without diabetic. Risk factors for UTIs in diabetics include duration of diabetes, poor metabolic control of diabetes ,sexual intercourse ,and complications of diabetes .Fungal urinary infection are more frequent in diabetics (34).

It has been postulated that *Lactobacilli* play a critical role in maintaining the normal vaginal ecosystem by preventing overgrowth of pathogens and other opportunistic organisms by producing lactic acid, hydrogen peroxide ( $H_2O_2$ ), bacteriocins and other antimicrobial substances (35).

#### **The associations between urinary tract infection and vaginitis**

Results found that 36 women had vaginitis with urinary tract infections; that indicated women with vaginitis had an increased risk of urinary tract infections.

An association between bacterial vaginitis and acute cystitis in women who used diaphragms was recorded by (37). It is possible that women with bacterial vaginitis developed urinary tract infections because of sexual activity (38).

It is believed that altering the vaginal pH by repetitive alkalinization can contribute to the development of bacterial vaginitis (39) and may facilitate colonization with uropathogens because of overgrowth of pathogenic bacteria and the absence of lactate and hydrogen peroxide producing *Lactobacilli* in the vagina, putting those women at risk for urinary tract infection (40).

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