

# Genital infections among women using various contraceptive methods in Basra, Iraq

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الأمراض التناسلية بين النساء اللاتي يستعملن وسائل منع الحمل المختلفة في العراق  
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خلاصة: أجري استقصاء بين النساء المصابات بنجيح (إفراز) مهبلية غير عادي، من الترددات على عيادة الولادة والأمراض النسائية بمستشفى البصرة في العراق، في المدة من أيلول/سبتمبر 1995 إلى حزيران/يونيو 1996. ومن بين 260 امرأة تم فحصهن، وجد أن 250 (96.2%) كن مصابات بأمراض منقولة جنسياً أو بأمراض بولية تناسلية أخرى. وبلغ معدل الإصابة بأمراض متعددة 16.2%. وفي هذه الدراسة مقارنة بين معدلات العدوى بحسب الفئات العمرية ووسائل منع الحمل المستعملة. ومن بين النتائج المهمة إحصائياً وجود أنواع المبيضات بنسبة 25.0% بين النساء اللاتي يتناولن حبوب منع الحمل، ووجود أنواع الجار دنريلة والكلبسيلا بين النساء اللاتي يستعملن الوسائل الرحمية أكثر من وجودها بين غيرهن.

**ABSTRACT** A survey of women with abnormal vaginal discharge was conducted among patients attending an obstetrics and gynaecology clinic at Basra Hospital, Basra, Iraq, from September 1995 to June 1996. Out of 260 women examined, 250 (96.2%) were found to be infected with sexually transmitted and other genitourinary diseases, with a 16.2% incidence of multiple infections. This study compares the rate of infection by age group and contraception methods used. Significant findings include a 25.0% occurrence of *Candida* spp. among women using oral contraception and higher occurrence of *Gardnerella* sp. and *Klebsiella* spp. for women using an IUD as compared to nonusers.

## Les infections génitales chez les femmes utilisant différentes méthodes contraceptives en Iraq

**RESUME** Une enquête auprès de femmes ayant des écoulements vaginaux anormaux a été réalisée parmi les patientes qui se sont rendues aux consultations d'obstétrique et de gynécologie à l'Hôpital de Basra en Iraq de septembre 1995 à juin 1996. Sur les 260 femmes examinées, 250 (96,2%) étaient atteintes de maladies sexuellement transmissibles et autres infections de l'appareil génito-urinaire, avec une incidence d'infections multiples s'élevant à 16,2%. Cette étude compare le taux d'infection par groupe d'âge et méthode contraceptive utilisée. Parmi les résultats importants, on note la présence de 25,0% de *Candida* spp. chez les femmes utilisant la contraception orale et une fréquence plus importante de *Gardnerella* sp. et de *Klebsiella* spp. chez les femmes utilisant un dispositif intra-utérin par rapport à celles qui n'en utilisent pas.

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## Introduction

Many diseases of the genitourinary system are still common due to sexual activity, availability of contraception, changes in marriage and divorce, socioeconomic status and increased detection due to heightened awareness. The possible long-term sequelae of infertility, ectopic pregnancies and even death have captured public attention as these infections become more prevalent.

It is difficult to compare studies of the microbiology of sexually transmitted diseases (STD) and other genitourinary diseases, because of differences in subject populations, clinical definitions of "normal", the presence of mixed infections and microbiologic isolation techniques. Possible interactions between microorganisms may complicate the physiology and pathogenesis of genital tract infections even further [1,2].

Recent epidemiological reviews have uniformly suggested that the risk of acute pelvic inflammatory disease is significantly higher in women who use contraceptive methods than in nonusers, and also among women who have never been pregnant than in women who have been pregnant [3].

These observations suggest an increased risk of developing genital diseases. As there was no study available concerning the association of these diseases among women using various contraceptive methods, this study was undertaken.

## Patients and methods

High vaginal swabs were obtained from 260 women patients with variable degrees of abnormal vaginal discharge. They were examined by wet preparation, Gram-

stained smear and bacteriological culture methods. All women were attending the Obstetrics and Gynaecology Clinic at Basra Hospital during the period September 1995 to June 1996. Their ages ranged from 15 to 44 years. A careful relevant history and full gynaecological examination were undertaken.

The vaginal swabs were inoculated on blood, chocolate and McConkey's agar which were incubated at 37 °C for 24 hours. To assess the association between the use of various contraceptive methods in relation to specific microorganisms, chi-squared ( $\chi^2$ ) analysis was performed on two groups, the nonusers and the users of a certain contraceptive method. It was not used in a sample of less than five.

## Results

The highest prevalence of abnormal vaginal discharge was among patients of age group 15–24 years (Table 1). This constituted 94.7% of all examined patients in that group.

Isolation rates of the microorganisms under investigation in this sample are shown in Table 2. Out of 260 women examined, 250 (96.2%) were found to be infect-

Table 1 Prevalence of genital infections among women according to age

Age (years)	No. examined	No. infected	%
15–24	150	142	94.7
25–34	74	43	58.1
35–44	36	19	52.8
Total	260	204	78.5

**Table 2 Prevalence of genital microorganisms isolated from vaginal swabs taken from women examined according to contraceptive method used**

Microorganism	Contraceptive method									
	None (n = 84)		Oral (n = 80)		IUD (n = 69)		Condom (n = 25)		Total (n = 260)	
	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Candida</i> spp.	12	14.0	20	25.0	10	14.5	5	20.0	47	18.1
<i>G. vaginalis</i>	5	5.8	4	5.0	11	15.9	2	8.0	22	8.5
<i>N. gonorrhoeae</i>	11	12.8	9	11.3	8	11.6	0	—	28	10.8
<i>T. vaginalis</i>	18	20.9	5	6.3	10	14.5	0	—	33	12.7
<i>Staphylococcus aureus</i>	13	15.1	10	12.5	6	8.7	5	20.0	34	13.1
<i>Streptococcus fecalis</i>	13	15.1	14	17.5	10	14.5	5	20.0	42	16.2
<i>Escherichia coli</i>	2	2.3	2	2.5	3	4.3	1	4.0	8	3.1
<i>Klebsiella</i> spp.	5	5.8	6	7.5	10	14.5	5	20.0	26	10.0
<i>Pseudomonas</i> spp.	2	2.3	1	1.3	1	1.4	2	8.0	6	2.3
<i>Proteus</i> spp.	3	3.5	1	1.3	0	—	0	—	4	1.5
Total	84	97.7	72	90.0	69	100.0	25	100.0	250	96.2

ed. *Candida* spp. infection was higher among women using oral contraceptives (25.0%) compared with nonusers (14.0%) ( $P < 0.05$ ). *Gardnerella* sp. infection was significantly higher among women using an intrauterine device (IUD) (15.9%) than among women using no method (5.8%) ( $P < 0.05$ ) or other methods (5.7%).

As shown in Table 2, *Trichomonas vaginalis* was more frequently present among women who used no contraceptive (20.9%) than among those who used oral contraception (6.3%) ( $P < 0.05$ ). A significant finding was the highest isolation rate of coliforms from women using various methods of contraception (Table 2). *Klebsiella* spp. were more highly prevalent among IUD users (14.5%) than among nonusers (5.8%). Two concurrent infections were reported among 14.6% women while 1.5% had three concurrent infections (Table 3).

## Discussion

Although precise data are difficult to obtain, the prevalence of genital infections can lead to considerable mortality and morbidity among neonates and their mothers [2]. This study shows highly significant increasing rates of sexually and non-sexually transmitted agents in the presence of vaginal discharge, active sexual age and use of contraceptives. These agents would constitute an important public health problem among the non-pregnant women in the region.

The highest infection rate (94.7%) was detected among women in the 15–24 age group, which represents the most active sexual age. The incidence of pathogenic agents decreased with advancing age [4].

This study observed that oral contraceptive users have a higher incidence of vaginal candidiasis. The precise role of oral

**Table 3 Patterns of multiple genital infections in 260 patients studied**

Microorganism	No. Infected	%
<i>Candida</i> and <i>E. coli</i>	1	0.4
<i>Candida</i> and <i>Klebsiella</i>	2	0.8
<i>Candida</i> and <i>T. vaginalis</i>	2	0.8
<i>Candida</i> and <i>G. vaginalis</i>	5	1.9
<i>Candida</i> and <i>S. aureus</i>	5	1.9
<i>Candida</i> and <i>S. fecalis</i>	9	3.5
<i>T. vaginalis</i> and <i>G. vaginalis</i>	1	0.4
<i>T. vaginalis</i> and <i>S. fecalis</i>	1	0.4
<i>T. vaginalis</i> and <i>S. aureus</i>	2	0.8
<i>T. vaginalis</i> and <i>Klebsiella</i>	3	1.2
<i>T. vaginalis</i> and <i>N. gonorrhoeae</i>	4	1.5
<i>S. aureus</i> and <i>G. vaginalis</i>	1	0.4
<i>S. aureus</i> and <i>N. gonorrhoeae</i>	2	0.8
Total	38	14.6
<i>Candida</i> , <i>Klebsiella</i> and <i>S. fecalis</i>	1	0.4
<i>Candida</i> , <i>N. gonorrhoeae</i> and <i>S. aureus</i>	2	0.8
<i>T. vaginalis</i> , <i>Klebsiella</i> and <i>N. gonorrhoeae</i>	1	0.4
Total	4	1.5
Total	42	16.2

contraceptives in predisposing to symptomatic vaginal infection remains controversial [5,6]. The undetermined yeasts other than *Candida albicans* may not be the cause of the vaginal discharge. The increased carriage is thought to result from the effects of female hormones on epithelial cell adherence or from the glycogen and substrates available to the microorganisms as well as the direct effect of oral contraceptives on yeast virulence. Another predisposing factor may be tight nylon underwear; poor ventilation and increased temperature and

moisture of the perineum may act to sensitize the mucosa to the pathogenic mechanisms of resident yeast in the vagina and induce symptoms [6]. The other microorganism which was isolated in a higher prevalence rate among women using a contraceptive method, namely an IUD, is *G. vaginalis*.

The population at high risk for developing pelvic inflammatory diseases include those who have a prior history of those diseases and multiparous women under 25 years of age using an IUD. The risk of developing infection among women wearing an IUD is 2 to 4, among women using oral contraceptives 0.3 and among women using a barrier method of contraception 0.4 in comparison to a risk of 1 among women not using contraception [7].

The decrease in incidence of upper genital tract infections is believed to be secondary to thicker cervical mucus produced by the progestin component of oral contraceptives, which inhibits sperm and bacterial penetration [8]. The decrease in duration of menstrual flow accompanying use of oral contraceptives theoretically creates a shorter interval for bacterial colonization [9].

The IUD is highly associated with bacterial vaginosis [10], suggesting that the IUD may influence the growth of anaerobes, which have an important role in the pathogenesis of bacterial vaginosis [11]. Also, the insertion of an IUD can never be a sterile procedure. Oral contraceptives were found to be associated with positive *G. vaginalis* cultures because they increase vaginal epithelial glycogen content, therefore increasing the number of lactobacilli [11].

In this study, *T. vaginalis* and *Neisseria gonorrhoeae* were not found to be associated with contraception. Women using either barrier or oral contraception in the six

months prior to becoming pregnant were far less likely to be colonized with *T. vaginalis* [12]. However, these relationships need to be more clearly delineated.

The interesting finding is the association of *Klebsiella* spp. with the IUD method of contraception. However, the picture is not clear in the case of *Escherichia coli*, *Pseudomonas* spp. and *Proteus* spp. due to the small numbers of infected women involved in this study. It is also shown that condoms are effective mechanical barriers to various microorganisms [3,13], including the spread of sexually transmitted diseases [4,7].

Multiple infections were exceedingly common. Josey [14] documented the occurrence of *G. vaginalis* with various con-

current lower genital tract infections, including candidiasis, trichomoniasis, genital herpes and gonorrhoea. The most frequent multiple infections associated with the isolation of *G. vaginalis* was trichomoniasis, followed by yeast infection [10,15].

In spite of the infection noticed among a number of women patients during speculum examination, there were no pathogenic organisms isolated.

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Reproductive health, with its main focus on maternal and neonatal health, family planning and early detection and management of sexually transmitted diseases, is a priority area for both WHO and UNFPA. Collaboration with UNFPA in support of reproductive health care, including family planning services, continuing during 1997 in Djibouti, Iraq, Jordan, Lebanon, Palestine, Somalia, Syrian Arab Republic and Republic of Yemen.

Source: The Work of WHO in the Eastern Mediterranean Region. Annual Report of the Regional Director, 1 January - 31 December 1997, page 70.