

Female Urology

Asymptomatic Bacteriuria in Users of Intrauterine Devices

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ABSTRACT

Introduction: The aim of this study was to compare the frequency of asymptomatic bacteriuria in women who use intrauterine devices (IUDs) as a contraceptive method with subjects who use tubal ligation (TL).

Materials and Methods: A cohort study was conducted on women who were candidates for IUD insertion or TL (control). The patients were followed for 3 months, and urine cultures were assessed for bacteriuria at the end of the study.

Results: Overall, 131 women (mean age, 31.9 ± 4.25 years) in the IUD group and 78 (mean age, 32.1 ± 4.0 years) in the control group were studied. The parity score was 2 or more in 72% of the women in the IUD group and in 74% of the controls. The average intercourse frequency was twice per week in 82% of IUD users and 80% of controls. Fifty-seven percent of the women in the IUD group and 55% of the women in the control group had graduated secondary school (high school). Asymptomatic bacteriuria was detected in 13 IUD users (9.9%) and in 1 woman (1.3%) in the control group (risk ratio = 7.74, confidence interval: 1.03 to 58.03; $P = .019$). The detected microorganism in the urine culture was *Escherichia coli* in 12 IUD users and in 1 patient in control group. *Klebsiella* was found in 1 IUD user.

Conclusion: Use of an IUD is a risk factor for urinary tract infection and should be considered, especially in women with recurrent urinary tract infections.

KEY WORDS: intrauterine device, urinary tract infection, contraception

Introduction

One fifth of women will have a urinary tract infection (UTI) at some time.⁽¹⁾ It has been suggested that early infection or colonization of the upper urinary tract occurs in a proportion of women with lower genitourinary tract infection.⁽¹⁾ It is unclear how many of these women subsequently develop acute pyelonephritis if left

untreated.⁽¹⁾ Urinary tract infection is a result of an interaction between a uropathogen and the host, and increased bacterial virulence appears to be necessary to overcome host resistance.

Contraceptive methods are among the independent risk factors for UTI. Using a diaphragm or cervical cap appears to increase the risk of bladder infection.^(2,3) Women who use spermicides regularly have increased vaginal colonization with the bacterium *Escherichia coli* after intercourse.⁽⁴⁾ Also, in British prospective studies on high-dose oral contraceptives, it has been shown that UTIs increase by 20%.⁽⁵⁾

Received January 2005

Accepted September 2005

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There is a paucity of research, however, regarding the prevalence of UTIs in users of intrauterine devices (IUDs). Pelvic inflammation and probably congestion of bladder trigone in IUD users may affect the bladder and facilitate UTIs. Some physicians have already suggested this, but there is not enough evidence yet. This study was designed to investigate the risk of asymptomatic bacteriuria among IUD users.

Materials and Methods

A cohort study was conducted at the Imam Hossein Hospital from November 1999 to February 2001. Women who were candidates for IUD insertion or tubal ligation (TL) were selected through a nonrandom convenience sampling to enroll in the study. Inclusion criteria were being of childbearing age (25 to 44 years) and choosing an IUD or TL for contraception. Those with a history of recurrent UTI (2 or more episodes per year), urinary tract stone, or gynecologic problems such as vaginitis or cervicitis were excluded. Patients were assigned into 2 groups: IUD users (IUD group) and TL (control group), according to their preferences.

Informed consent was obtained from all participants, and the respective procedures were performed. The type of IUD used was a cu-T 380-A (ParaGard, FEI Women's Health, US), and the technique used for TL was the Parkland method. All women were followed and visited 3 months later, since pelvic inflammatory disease is more prevalent during the first 20 days after insertion of an IUD.⁽⁶⁾

Patients provided a fresh, single, midstream urine specimen, at the same laboratory, for urinalysis and urine culture. A urine specimen with a colony count of more than 100000/mL (based on the standard definition of a positive culture) in the absence of urinary symptoms was defined as asymptomatic bacteriuria. Other pelvic infections that usually are manifested with urethral symptoms but with a colony count less than 100000/mL were not considered as bacteriuria.

Data were collected and matched for age (with 5-year intervals), parity scores, level of education (primary, secondary, or academic), and sexual activities (frequency of coitus, approximately 2 times a week, more, or less); unmatched records were excluded.

Data were analyzed with a *t* test for quantitative variables, and chi-square and relative

risk tests for qualitative variables, using SPSS software (Statistical Package for the Social Sciences, version 9.0, SSPS Inc, Chicago, Ill, USA). A *P* value less than .05 was considered statistically significant.

Results

A total of 228 patients participated in this study. Records of 19 IUD users were excluded to match the groups for age. Overall, 131 women in the IUD group and 78 in the control group were studied. The mean age of patients in the IUD group was 31.9 ± 4.25 years, and it was 32.1 ± 4.0 years in controls. The parity score was 2 or more in 72% of the women in the IUD group and in 74% of controls. The average intercourse frequency was twice per week in 82% of IUD users and 80% of controls. Fifty-seven percent of women in the IUD group and 55% in the control group had graduated secondary school (high school).

Asymptomatic bacteriuria were detected in 13 IUD users (9.9%) and in 1 woman (1.3%) in the control group (risk ratio = 7.74, confidence interval: 1.03 to 58.03; *P* = .019). The detected microorganism in urine culture was *Escherichia coli* in 12 IUD users and in 1 patient in control group. *Klebsiella* was found in 1 IUD user.

Discussion

Urinary tract infection is one of the most common infections in all age groups of women. Contraceptive devices are indirect risk factors for UTI predisposition. Some contraceptive methods such as the diaphragm, oral contraceptive pills, and cervical cap are contributing factors for UTI. Using a diaphragm or cervical cap appears to increase the risk of bladder infection. The problem may relate not only to mechanical obstruction, but also to alterations in vaginal flora produced by the spermicides accompanying a diaphragm or cap.^(2,3) Women who use spermicides alone, regularly, have increased vaginal colonization with *Escherichia coli* and may be predisposed to bacteriuria after intercourse.⁽⁴⁾ Chlamydial colonization of the cervix appears to be more likely in contraceptive pill users than in nonusers.⁽⁷⁾ In addition, some mucopurulent cervicitis and vulvovaginal infections caused by *Chlamydia trachomatis* and *Neisseria gonorrhoeae* have symptoms of UTI.⁽⁷⁾

In the present study, IUD was associated with

an increased risk of developing UTI. Although some physicians already have considered this, not enough evidence exists regarding the urinary infectious complications of IUD use.

Pelvic and vaginal inflammation and congestion of bladder trigone in IUD users may affect the bladder and facilitate UTI. Bacterial vaginosis, which is one of the most common forms of vaginitis, has previously been referred to as *nonspecific* or *Gardnerella vaginitis*.⁽⁷⁾ In an epidemiologic survey of 2228 women by Moi, from Sweden,⁽⁸⁾ those using barrier contraceptives had a significantly lower prevalences of bacterial vaginosis than did those using an intrauterine device or no contraceptive. These findings may have implications regarding complications associated with lower genital tract infections and may strengthen the hypothesis that bacterial vaginosis is a risk factor for pelvic inflammatory disease.

Cervicovaginitis seems not to be the main cause of UTI in IUD users, as other studies have revealed that inflammation of bladder trigone secondary to pelvic inflammation disease is a causal factor. In 1976, Zahran and colleagues⁽⁹⁾ compared the incidence of bacteriuria and cystoscopic changes in 200 women who had used oral contraceptives between 1 month and 2 years and 150 IUD users with 50 women who had used neither method. Bacteriuria was present in 40.5% of pill users, 20% of women fitted with IUD, and 16% of women in control group. Bladder trigone congestion was observed in 24.6% of IUD users: 56% of whom had used an IUD between 1 and 3 months, 35% of whom had used it for more than 2 years, and no users between these time parameters. They concluded that to avoid urinary bladder effects and inflammatory pelvic disease, IUDs should not be used more than 2 to 3 years continuously.

Our results emphasize that these changes in the genitourinary tract system can lead to bacteriuria and UTI. Therefore, any symptom of UTI warrants IUD users to detect and treat the infection.

Conclusion

The IUD is an appropriate choice for women in long-term monogamous sexual relationships who are not at high risk for infection. It is a reversible contraception, especially for older and parous women. Long-term use of the IUD is associated with impressive safety, but the increasing risk of UTI should always be considered. In patients with a history of recurrent UTIs, IUD may not be a method of choice, and other contraceptives are preferred.

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