

Distribution of Asymptomatic Bacteriuria among Women use Intrauterine Devices (IUDs) according Sociodemographic Characteristics Factors in Takrit, Iraq

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Abstract

Objectives: The goal of this study was to learn more about the epidemiology of asymptomatic bacteriuria among women who used intrauterine devices (IUDs) in AL-Dour according to demographic characteristics.

Methods: This is a cross section study conducted on reproductive age group women attending gynecological and obstetrical outpatient department in AL-Door during the period from 15th October 2020 to 15th April 2021, to identify the frequency, sociodemographic, and associated factors of ASB in female with IUCD.

Results: This study revealed that frequency of ASB were more frequent among women those with IUCD (89%) than those without IUCD (75%). ASB were most common in age group (25–35 years), in woman those with parity (3 and more), in woman which inserted the IUCD for 2 years and less, and in woman which have 3 and more sex relations per week in both groups with IUDS (46.4%) and those Without IUDS (53.6%).

Conclusion: This study concluded that women in productive age in AL-Door community have a high prevalence ASB were more frequent among women those with IUCD (89%) with significant difference. The frequent ASB was most commons among housewife women, among age group between (25–35 years), woman with high parity (3 and more) specially in women were have IUCD, have 3 and more sex relations per week in both groups With IUDS and Without IUDS, which inserted the IUCD for 2 years and less.

Keywords: Asymptomatic bacteriuria, intrauterine device, urinary tract infection, contraception

Introduction

A urinary tract infection (UTI) is an infection of the urinary tract in any part of the body.¹ Bacteria, parasites, or viruses that live in the intestines, vaginal canal, or around the urethra cause UTIs. Both in the community and in hospitals, urinary tract infections (UTIs) are among the most common bacterial infections in humans. It affects people of all ages and genders, and it frequently necessitates immediate medical attention.²

A significant count of bacteria (equal to or greater than 105 CFU/ml) in an appropriately collected urine specimen from an individual without symptoms of urinary tract infection is defined as asymptomatic bacteriuria (ASB).¹ *Escherichia coli* is the most common cause of asymptomatic bacteriuria, accounting for 80 percent to 90 percent of isolates.³

A urinary tract infection (UTI) affects one-fifth of women at some point in their lives. Early infection or colonization of the upper urinary tract has been suggested to occur in a proportion of women with lower genitourinary tract infection.

If left untreated, it's unclear how many of these women will develop acute pyelonephritis. A uropathogen and the host interact to cause urinary tract infection, and increased bacterial virulence appears to be required to overcome host resistance.⁴

Since the 1960s, intrauterine devices (IUDs) have been widely used. According to the World Health Organization, approximately 160 million women worldwide use IUDs in 2002.⁵ IUDs are a popular form of contraception because, aside from being long-acting and reversible, they do not interfere with sex spontaneity. IUDs, on the other hand, have been linked to short-term complications like vaginal bleeding,

pelvic discomfort, dyspareunia, pelvic infection,⁶ and premenopausal recurrent urinary tract infection (UTI) despite antibiotic treatment.⁷

One of the independent risk factors for UTI is the use of contraceptive methods. It appears that using a diaphragm or cervical cap increases the risk of bladder infection.^{8,9} After intercourse, women who regularly use spermicides have higher vaginal colonization with the bacterium *Escherichia coli*.¹⁰ In addition, UTIs have been shown to increase by 20% in British prospective studies on high-dose oral contraceptives.¹¹ However, there is a scarcity of research on the prevalence of UTIs in intrauterine device users (IUDs). Pelvic inflammation and, most likely, bladder trigone congestion in IUD users can affect the bladder and make UTIs more likely. Some doctors have already suggested it, but there isn't enough evidence to back it up.¹²

Methods and Materials

From the 15th October 2020 to the 15th April 2021, 143 women in the reproductive age group aged 20–49 years attended gynecological outpatient clinics and primary health care centers in AL-Door city, 63% of whom used IUCD as a contraceptive method and 60% of whom did not. Women who used IUCD as a contraceptive method were divided into two groups: those who used it and those who did not.

In this study, we used a self-designed questionnaire to collect the demographic information from the patients.

Data were coded and entered to computer for statistical analysis, and was conducted by using SPSS (Statistical Package For Social Science) version 24. Since the variables

studied were qualitative data, all data were arranged in frequencies and associations between variables were tested by using the chi-square and *P*-value below or = 0.05 was considered as significant.

Results

Table 1 shows that the distribution of ASB were more frequent among women those with IUCD (89%) than women those without IUCD (75%) with significant difference.

Table 2 show ASB cases among overweight women was the same among those with and without IUCD (50%), while cases of ASB among women with normal weight was higher among those with IUCD (55.3%) than those without IUCD (44.7%). with no significant difference.

Table 3 reveals that the most frequent cases of ASB among those with IUCD among age group (35 years and more) (60.6%) and less among those with age group (less than 25 years) (31.3%). While those without IUCD, the most frequent cases among age group (25 years and less) (68.7%) and the less frequency was among those with age group (35 years and more) (39.4%). With no significance difference.

Table 4 shows that the distribution of ASB cases were the same among those with IUDs and those without (50%); While Women with *Graduate and more* educational level were form (47.4%) in women with IUCD and (52.6%) without IUCD. With no significance difference.

Table 1. Distribution of bacterial growth cases according to presence of IUD

IUDS Bacterial growth	With IUCD		Without IUCD		Total
Yes	56	89%	60	75%	116
No	7	11%	20	25%	27
Total	63	100%	80	100%	143

The chi-square statistic is 4.4389. The *P*-value is 0.035128. The result is significant at *P* < 0.05.

Table 2. Distribution of bacterial growth cases according body weight and presence of IUD

IUDS	With IUCD		Without IUCD		Total
Normal weight	17	44.7%	21	55.3%	38 100%
Overweight	39	50%	39	50%	78 100%
Total	56	48.3%	60	51.7%	116 100%

The chi-square statistic is 0.2835. The *P*-value is 0.594443. The result is not significant at *P* < 0.05.

Table 3. Distribution of bacterial growth cases according to age groups and presence of IUD

IUDS Age	With IUCD		Without IUCD		Total
Less than 25 years	5	31.3%	11	68.7%	16 100%
25–35 years	31	46.3%	36	53.6%	67 100%
More than 35 years	20	60.6%	13	39.4%	33 100%
Total	56	48.3%	60	51.7%	116 100%

The chi-square statistic is 3.9748. The *P*-value is 0.137053. The result is not significant at *P* < 0.05.

Table 5 shows that the most frequency of ASB were (73.3%) of woman with parity less than 3 have no IUCD, While in woman with parity 3 and more the maximum frequency of ASB were (55.8%) have IUCD, With significance difference.

Table 6 shows ASB are mostly in women without IUCD in both employed and unemployed in frequency (52.8%) in employed and (51.3%) in unemployed, With no significance difference.

Table 7 shows that ASB are mostly in woman which inserted the IUCD for 2 years and less in frequency (92.7%), when the duration of insertion be 3 years and longer ASB frequency are (81.8%), With no significance difference.

Discussion

One of the most common infections among women of all ages is urinary tract infection. Indirect risk factors for UTI predisposition include contraceptive devices.^{13,14}

Table 4. Distribution of bacterial growth cases according to presence of IUD and education

IUDS Education	With IUCD		Without IUCD		Total
Secondary and less	20	50%	20	50%	40 100%
Graduate and more	36	47.4%	40	52.6%	76 100%
Total	56	48.3%	60	51.7%	116 100%

The chi-square statistic is 0.0727. The *P*-value is 0.787472. The result is not significant at *P* < 0.05.

Table 5. Distribution of bacterial growth cases according to parity and presence of IUD

IUDS Parity	With IUCD		Without IUCD		Total
Less than 3	8	26.7%	22	73.3%	30 100%
3 and more	48	55.8%	38	44.2%	86 100%
Total	56	48.3%	60	51.7%	116 100%

The chi-square statistic is 7.5672. The *P*-value is 0.005944. The result is significant at *P* < 0.05.

Table 6. Distribution of bacterial growth cases according subject occupation and presence of IUD

IUDS	With IUCD		Without IUCD		Total
Employee	17	47.2%	19	52.8%	36 100%
Housewife	39	48.7%	41	51.3%	80 100%
Total	56	48.3%	60	51.7%	116 100%

The chi-square statistic is 0.0232. The *P*-value is 0.878918. The result is not significant at *P* < 0.05.

Table 7. Distribution of cases with IUCD according to duration of IUCD

Bacterial growth Duration of IUDs	Yes	No	Total
2 years and less	38	92.7%	3 7.3% 41 100%
3 years and more	18	81.8%	4 18.2% 22 100%
Total	56	88.9%	7 11.1% 63 100%

The chi-square statistic is 0.7715. The *P*-value is 0.379745. The result is not significant at *P* < 0.05.

The findings of this study revealed that women of reproductive age who used IUCD as a contraceptive method had a high frequency of ABU (89%) while women who did not use IUCD had a lower frequency (45%). The use of an IUD was linked to a higher risk of developing ASB in this study, with a statistically significant result. Other research findings show that these changes in the genitourinary tract system can lead to bacteriuria and urinary tract infections (UTIs). IUD users may experience pelvic and vaginal inflammation, as well as bladder trigone congestion, which can affect the bladder and make UTIs more likely.¹⁵ Our findings are consistent with those of a 2005 study in Iran, which found ASB in 9.9% of IUD users and (1.3%) in the control group.¹⁶ According to cystoscopic changes in women who had used IUDs, bacteriuria was present in 20% of women who had been fitted with an IUD. Bladder trigone congestion was found in (24.6%) of IUD users, with (56%) having used the device for less than three months and 35 percent having used it for more than two years.¹⁷

The current study found that the proportion of overweight women with ASB was the same (50%) whether they had IUCD or not, that obesity has a stronger link to UTI than IUCD, and that a high BMI was linked to an increased risk of urinary tract infection and sepsis.¹⁸⁻²⁰ is a number that can be used to represent a number of different things.

According to our findings (67.2%) of ASB cases were overweight, with all of them being married and of reproductive age, indicating that marital status is a significant predictor of obesity. Obesity is more common in married women than in divorced or single women.²¹ According to a previous study conducted in Bangladesh in 2014, the prevalence of overweight and obesity among Bangladeshi women of reproductive age is high and rising.²²

While the prevalence of ASB among women of normal weight was higher in those who used IUCD (55.3%) than in those who did not (44.7%), the effect of IUCD appears to play a role in infection, which explains why the ABU was higher in those who used IUCD.^{23,24}

In the current study, the ASB were most common in the 25–35 year old age group, with (46.3%) of them using IUCD. This finding, which is backed up by previous research, shows that genitourinary tract infections are more common in young married women aged 26 to 35 years old (31.8%).²³ The average age of patients who used an IUD was 31.9 ± 4.25 years, which is similar to our result.¹⁶ Also, according to a 2014 study conducted in Hilla, positive cultures of vaginal swab are prevalent among women aged 20 to 40 years.²⁴ Copper-containing IUDs, on the other hand, can alter the normal bacterial flora of the female genital tract if used or present.²⁵ In the presence of an IUD, this change in the ecological system may have long-term consequences in terms of infection development. In addition to an increased risk of bacterial vaginosis, it has also been linked to bladder trigone congestion. The increased risk of UTI among IUD users is due to this congestion, which can contribute to the development of UTI.^{16,17,26}

On the other hand, there are those who support our results. The majority of IUD users were in the 20 s and 30 s.²⁰⁻³⁰ This reflects the MOH's FP program's national policy, which does not prefer to use the IUD on young women or nulli-para women.²⁷

In a recent study, ASB cases in secondary school were about the same for those who had IUDs and those who didn't (50%). Women without IUCD had a higher ASB (52.6%) than women with a graduate or higher educational level. That can

be explained by the fact that the majority of our sample had a high educational level, and the majority of women who used IUCD had a high educational level as well. According to the findings of the 2008. Turkish Population and Health Survey, the use of IUDs as a protection method increased in tandem with educational levels.²⁸ Similarly, it was discovered that those who used an IUD had a higher educational status than those who did not. The rate of IUDs (32.2%) was the highest, as was their educational level.²⁹ According to a study conducted in Iran in 2005, 57% of women in the IUD group had completed secondary school (high school).¹⁶

Another study, which supports our findings, revealed that IUD users more than half of the participants had a good education, with 39.5 percent having a secondary education and 12.5 percent having a college education.²⁷ According to the current study, ASB is more common in women with three or more children (74.1%), particularly in those who use IUCD (55.8%) with significant, which can be explained by the multiparameter analysis. Previous studies have shown that women prefer IUCD to other contraceptive methods. Multipara women, or women who have had two or more pregnancies, prefer long-term contraception to avoid unwanted pregnancies.³⁰ Long-term contraception, such as the IUD, is effective in reducing the rate of unwanted pregnancy, according to research conducted in the United States. All women should consider this intrauterine device contraceptive, but young or prim-para women with new children prefer not to use one. This resulted in discomfort and irregular bleeding. As a result, multiparous women prefer long-term contraception because they have prior experience with it. As a result, mothers with children older than two were more likely to use long-term contraception to avoid unwanted pregnancies. At the same time, the Palestinian Central Bureau of Statistics revealed that the majority of IUD users begin using them after their third child is born.^{31,32} This is similar to the results of an IRAN search in 2005. In the IUD group, 72 percent of the women had a parity score of 2 or higher, while 74 percent of the controls (16) had a parity score of 2 or higher. When compared to employed women who do not use IUCD, ASB are most common in unemployed women who used IUCD (48.7%) or did not use IUCD (51.3%). This distinction was relevant to our community because the majority of young people, despite having a high level of education, have little or no chance of finding work in either gender. In our study, (80) cases were unemployed out of a total of (25) cases with ASB. Our findings are supported by a previous study that found that the majority of females with genitourinary tract infections (72.1%) were housewives.²³ Another study conducted in 2004 at An-Najah University found that the majority of the women in the study were housewives (85.5%).¹⁶

According to the duration of IUCD, ASB is more common in women who have had their IUCD for two years or less (92.7%). Our findings are consistent with those of Zahran and colleagues. Bladder trigone congestion was observed in IUD users in 1976 when the incidence of bacteriuria and cystoscopic changes were compared: (56%) of those who had used an IUD for 1 to 3 months, and (35% of those who had used it for more than 2 years). They came to the conclusion that IUDs should not be used for more than 2 to 3 years in a row to avoid urinary bladder effects and inflammatory pelvic disease. Because bacteriuria and urinary tract infections can result from these changes in the genitourinary tract system.¹⁶

Pelvic inflammation diseases can cause bladder trigone congestion in IUD users, which can affect the bladder and make UTIs more likely. Although there was a link found between IUDs that had been in place for a long time and a higher rate of pelvic inflammatory diseases (PIDs). Data from a previous study, on the other hand, showed a strong link between changes in the number and type of microbial flora and the proportion of female reproductive tract infections (RTIs) and the length of time IUDs were in place.

In the weeks following IUD insertion, however, there was a higher risk of infection. Pelvic infection caused by the use of an IUD has been a topic of discussion since the invention of the device.^{33,34}

According to a study conducted in Pakistan in 2019, PID ranged from seven months to one year after IUCD insertion.³⁵ A study published in 2020 found that women who used a Cu-IUD had a consistently elevated BV risk over the course of 18 months of use.³⁶

Conclusion

Women with IUCD have a higher frequency of ASB (89%), which is a statistically significant difference. Overweight

women are more likely to develop ASB, but this was true for both those with and without IUCD (50%). The frequency of ASB is highest among housewife women (69%), those with a Bachelor's degree or higher (65.5%), and those between the ages of 25 and 35 (57.7%). ASB were more common in women with parity 3 and, in particular, in women with IUCD (55.8%), with a statistically significant difference. ASB are mostly in woman which inserted the IUCD for 2 years and less in frequency (92.7%), when the duration of insertion be 3 years and longer ASB frequency are (81.8%).

Recommendations

Establish health facilities that deal with women health regarding early diagnosis and management of ASB. Raising the awareness of women for regular checkup after IUD insertion. Integrating STIs clinic to be available in primary health care, family planning and other routine health services. Awareness of female before IUCD insertion about the risks and complication of IUCD, as a risk factor for ASB. Proper IUD insertion technique to insure sterile conditions, training of health care workers for diagnosis and appropriate management of urinary tract infections prior to and throughout IUD use are vital. ■

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