
GYNAECOLOGY

Vaginal Health in Copper Intrauterine Device Users and Non-users

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ABSTRACT

Objective: To compare the cervicovaginal flora, vaginal symptoms, infections and pH between copper intrauterine device (IUD) users and non-IUD, non-hormonal users

Materials and Methods: A cross-sectional study was conducted from August 2010 to March 2011 at Ramathibodi Hospital. Ninety-two women at the age of 18-45 yr of whom 46 were copper IUD users while other 46 were nonusers. Each woman was evaluated clinically with direct observation of vaginal secretions, wet mount examination, Whiff test, vaginal pH testing and cervicovaginal culture. The outcomes included prevalence of aerobic and anaerobic bacteria colonization, bacterial vaginosis, vaginal candidiasis, trichomoniasis, vaginal symptoms and vaginal pH.

Results: There was no difference in prevalence of aerobic (50% VS 54.3%; $p=0.67$) and anaerobic (82.6%VS 76.1%; $p=0.44$) colonization between two groups. Vaginal symptoms, candidiasis and trichomoniasis were not significantly different. Prevalence of bacterial vaginosis was significantly higher among IUD users than non-IUD users. (28.3% VS 10.9%; $p=0.03$). The mean vaginal pH was significantly higher in IUD group (5.3 ± 0.6 VS 4.8 ± 0.8 ; $p<0.05$).

Conclusion: Copper intrauterine device altered vaginal pH and bacterial vaginosis was more common among IUD users.

Keywords: vaginal health, copper intrauterine device, cervicovaginal flora

Introduction

The intrauterine device (IUD) is the most widely-used method of contraception because of its safety and cost-effective benefit. Over 100 million women are now using this device. However, the number of user is still much less than expected. This probably due to the doubt about complications from IUD, particularly pelvic

inflammatory disease (PID) and other abnormal symptoms^(1,2). The most common medical reasons for early discontinuation of IUD are bleeding and/or pain along with genital infections.

Many women who have vaginitis generally complain of some combination of discharge, odor, irritation and itch. The most common causes of vaginitis

in premenopausal group were bacterial vaginosis, vaginal candidiasis and trichomoniasis⁽³⁾. Previous studies showed that copper IUD caused a change in the cervicovaginal flora that resulted in the predominance of anaerobic species⁽⁴⁻⁷⁾. These alterations may affect vaginal health and cause more vaginal infection and symptoms for example itching, soreness and abnormal discharge⁽⁸⁾.

This study was aimed to compare the prevalence of cervicovaginal flora, vaginal symptoms, infections and pH between copper intrauterine device users and non-IUD, non-hormonal users.

Materials and methods

This cross sectional study included women who attended family planning clinic at Ramathibodi Hospital, Bangkok, Thailand during August 2010 and March 2011. This study was approved by the Ethics Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University.

Women aged 18-45 years who used copper intrauterine device or other methods except hormonal contraception such as pill, levonorgestrel IUD, depot medroxyprogesterone acetate and implants were enrolled. Participants were excluded from the study if they had period, had vaginal bleeding, pregnant, took antibiotic within 1 week, used vaginal douch within three days, diagnosed of human immunodeficiency virus (HIV) infection, had visible vaginal or cervical mass suspected cancer, had active pelvic inflammatory disease and had multiple partners.

A baseline interview including data such as socio-demographic status, reproductive history, history about sexually transmitted infections and any abnormal vaginal symptoms, was conducted. Pelvic examination was then performed in each participant. An unlubricated speculum was inserted into the vagina and vaginal secretion was evaluated. Cervical and vaginal discharge was collected and transported in Stuart transport agar and thioglycate media. Samples of vaginal secretion were obtained with two dry cotton-tipped swabs from vaginal fornices. Vaginal pH was measured directly from one of the swabs, using an indicator papers (Merck, Germany: range 4.0-6.0). This

swab was subsequently mixed with 10% potassium hydroxide on a glass slide to be checked for the fishy amine-like odor. The other swab was mixed with normal saline in a test tube in order to be checked for clue cells and other vaginal infections such as trichomoniasis and candidiasis.

The cultivated media were kept at 37°C for 18–24 h in aerobic condition. The other half was incubated at 37°C for 48 h in anaerobic condition. These specimens were evaluated for aerobic and anaerobic colonies and bacterial subtypes according to their morphology, pigmentation, hemolysis, Gram staining and rapid ANAII kit.

The primary outcome was the prevalence of cervicovaginal flora in copper IUD users and non-IUD, non-hormonal users. Secondary outcomes included characteristics of vaginal discharge, vaginal symptoms, acid-base status, bacterial vaginosis (BV), candidiasis and trichomoniasis.

The sample size was calculated according to the previous study⁽⁷⁾ with 80% power to test the hypothesis and 10% data loss. A sample size of 92 women (46 cases per group) was needed to determine difference in the prevalence of anaerobic bacteria among IUD and non-IUD, non-hormonal users. The data were analyzed by Statistical Program for Social Sciences (SPSS) version 13.0. Chi square, t-test, mean, SD and percentage were used to determine the differences between groups as appropriate. A p-value < 0.05 was the significance level used for all analyzes.

Results

A total of 92 women were recruited, including 46 IUD users and 46 non-IUD users. The demographic and baseline characteristics of both groups of women were similar (Table 1). The mean age of the IUD group and the non-IUD, non-hormonal group were 38.3±6.2 years and 35.1±6.8 years, respectively. Multiload IUD and TCu 380 A were using in 30 (65.2%) and 16 (34.8%) women, respectively. The type of IUD was identified by the difference in the colors of IUD tail. Among the non-IUD, non-hormonal users, 31 (67.4%) women had female sterilization and 15 (32.6%) women practiced periodic abstinence. The prevalence of cervicovaginal

flora were 23 aerobic and 38 anaerobic cultures in copper IUD users whereas 25 aerobic and 35 anaerobic were cultured in non-IUD, non-hormonal users (Table 2). There was no significant difference between both groups.

Abnormal discharge were found in 13 (28.3%) copper IUD users and 12 (26.1%) non-IUD, non-hormonal users, while vaginal itching, dyspareunia and vaginal pain were equally found in both groups, 7 (15.2%), 4 (8.7%) and 2 (4.3%) respectively (Table 3). There was no significant difference in the vaginal symptoms between IUD and non-IUD users

Bacterial vaginosis was found in 13 IUD users

(28.3%) and 5 non-IUD, non-hormonal users (10.9%) (table 4). The prevalence of BV according to Amsel's criteria⁽⁹⁾ was significantly higher among copper IUD group than non-IUD, non-hormonal group ($p<0.05$). Neither IUD group nor non-IUD, non-hormonal group had trichomoniasis vaginalis. Vaginal candidiasis was found in 1 IUD users (2.1%) and 4 non-IUD users (8.7%). Trichomoniasis and candidiasis were not significantly different between both groups. Vaginal pH was significantly higher among IUD users (5.3 ± 0.6) than non-IUD, non-hormonal users (4.8 ± 0.8) ($p<0.05$).

Table 1. Subject's characteristic

Characteristics	IUD (N=46)	Non-IUD, non-hormonal (N=46)	p-value
Age*(mean $\pm$ SD)(years)	38.32 $\pm$ 6.21	35.15 $\pm$ 6.77	0.49
BMI*(mean $\pm$ SD)(kg/m ²)	25.39 $\pm$ 4.72	23.68 $\pm$ 4.22	0.33
Education** (%)			
< Bachelor degree	76.1%	71.7%	0.63
$\geq$ Bachelor degree	23.9%	28.3%	
Parity**			
<1	41.3%	45.7%	0.67
$\geq$ 2	58.7%	54.3%	

*t-test

**chi-square

Table 2. Cervicovaginal flora of IUD and non-IUD, non-hormonal users

Bacteria	IUD		Non-IUD, non-hormonal		Total (N=92)	p-value
	Number	%	Number	%		
Aerobe						
-gram(+)cocci	6	13.0	12	26.1	18	0.11
-gram(+)bacilli	7	15.2	5	10.9	12	0.54
-gram(-)bacilli	15	32.6	10	21.7	25	0.24
Total	23	50.0	25	54.3	48	0.67
Anaerobe						
-gram(+)cocci	9	19.6	5	10.9	14	0.24
-gram(+)bacilli	17	37.0	18	39.1	35	0.83
-gram(-)bacilli	23	50.0	22	47.8	45	0.83
Total	38	82.6	35	76.1	73	0.44
Fungus	6	40.0	9	60.0	15	0.39

Table 3. Vaginal symptoms and abnormal discharge

	IUD (N=46)	Non-IUD, non-hormonal (N=46)	p-value
	N (%)	N (%)	
Symptoms			
Vaginal itching	7(15.2)	7(15.2)	1.00
Vaginal pain	2(4.3)	2(4.3)	1.00
Pelvic pain	10(21.7)	9(19.6)	0.79
Dyspareunia	4(8.7)	4(8.7)	1.00
Vaginal discharge	13(28.3)	12(26.1)	0.85
Malodor	10(21.7)	4(8.7)	0.08
Abnormal color	7(15.2)	6(13.0)	0.76

Table 4. Vaginal pH and infections

	IUD (N=46)	Non-IUD, non-hormonal (N=46)	p-value
	N (%)	N (%)	
Bacterial vaginosis**	13(28.3)	5(10.9)	0.03
Trichomonas vaginalis**	0(0)	0(0)	-
Candidiasis**	1(2.1)	4(8.7)	0.16
pH* (mean $\pm$ SD)	5.3 $\pm$ 0.6	4.8 $\pm$ 0.8	0.007

*t-test

**chi-square

Discussion

From our study, prevalence of aerobic and anaerobic were not significant difference among copper intrauterine device users and non-users. These results were different from those in previous studies⁽⁵⁻⁷⁾ which found higher anaerobic colonization after insertion of copper IUD for 10 days than before the IUD insertion.

This is the first study to compare vaginal symptoms among IUD users with non-IUD, non-hormonal users. Women in both groups equally reported vaginal itching, vaginal pain, pelvic pain and dyspareunia including abnormal vaginal discharge.

The prevalence of bacterial vaginosis was higher among IUD users than non-IUD users. This finding is consistent with other studies which compared the prevalence of BV between IUD users and other

contraceptive users⁽¹⁰⁻¹¹⁾. Trichomoniasis was not found in this study. This may be explained by exclusion of women with multiple partners. Although previous study reported an association between candida infection and IUD⁽¹²⁾, we did not found such association in our study. Our sample size may be too small to demonstrate this effect. Since vaginal pH was one of Amsel's criteria to diagnose bacterial vaginosis. The higher prevalence of bacterial vaginosis in IUD users may lead to the higher mean vaginal pH in the same group of this study. Nevertheless, larger sample size is needed to confirm the association between bacterial vaginosis and Copper IUD.

Regarding to the strength of our study, we also examined vaginal symptoms and other common vaginal infections. Confounders such as sexual intercourse,

vaginal douche or hormonal use were also controlled. Limitation of our study was that the duration of IUD insertion and menstruation phase that may affect vaginal flora alteration were not studied. We also could not explain cause-effect because of our study design. However, further studies should aim to study the effect of IUD-inserted duration and menstrual phase on vaginal flora.

Conclusion

Copper intrauterine device altered vaginal pH and bacterial vaginosis was more frequent among IUD users. There was no difference in the prevalence of cervicovaginal flora, vaginal symptoms and abnormal vaginal discharge between copper IUD users and non-IUD, non-hormonal users. Health care providers should be aware of bacterial vaginosis in IUD users.

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สุขภาพของช่องคลอดในสตรีที่ใช้และไม่ใช้ห่วงอนามัยชนิดที่มีทองแดง

ธรรพัต ตีระกนก, จิตติมา มโนนัย, พริยาภรณ์ จงตระกูล

วัตถุประสงค์ : เพื่อศึกษาเปรียบเทียบเชื้อแบคทีเรียที่พบบ่อยในช่องคลอด อาการในช่องคลอด การติดเชื้อ และความเป็นกรด-ด่างในช่องคลอด ในกลุ่มสตรีที่ใช้ห่วงอนามัยชนิดที่มีทองแดงกับสตรีที่ไม่ใช้ห่วงอนามัยหรือฮอร์โมนคุมกำเนิด

วิธีการศึกษา : ทำการศึกษาสตรีที่มาใช้บริการที่โรงพยาบาลรามารัตน์ ระหว่างเดือนสิงหาคม พ.ศ.2553 ถึงเดือนมีนาคม พ.ศ.2554 โดยกลุ่มประชากรที่ศึกษาเป็นผู้หญิง 92 คน อายุตั้งแต่ 18 ปีถึง 45 ปี แบ่งเป็นกลุ่มที่ใช้ห่วงอนามัยชนิดที่มีทองแดง 46 คน และกลุ่มที่ไม่ใช้ห่วง 46 คน โดยผู้เข้าร่วมการวิจัยจะได้รับการตรวจภายในเพื่อดูลักษณะของสิ่งคัดหลั่ง และนำไปตรวจ wet mount examination, Whiff test ตรวจความเป็นกรด-ด่าง และนำไปเพาะเชื้อ ซึ่งผลการศึกษาที่ได้คือ ความชุกของเชื้อแบคทีเรียกลุ่มแอโรบ และแอนแอโรบแบคทีเรียลวาไจโนซิส เชื้อราแคนดิด้าในช่องคลอด ทริโคโมเนซิส อาการของช่องคลอด และความเป็นกรด-ด่างของช่องคลอด

ผลการศึกษา : ไม่พบความแตกต่างของความชุกของเชื้อแบคทีเรียกลุ่มแอโรบ (50% VS 54.3%; $P=0.67$) และแบคทีเรียกลุ่มแอนแอโรบ(82.6%VS 76.1%; $P=0.44$) ระหว่างสองกลุ่ม และไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติของอาการในช่องคลอด เชื้อราแคนดิด้าในช่องคลอด และทริโคโมเนซิส แต่พบว่าความชุกของแบคทีเรียลวาไจโนซิสในกลุ่มที่ใช้ห่วงอนามัยสูงกว่ากลุ่มที่ไม่ใช้ห่วง(28.3% VS 10.9%; $P=0.03$) และค่าเฉลี่ยของความเป็นกรด-ด่างในกลุ่มที่ใช้ห่วงมีค่าสูงกว่า (5.3 ± 0.6 VS 4.8 ± 0.8 ; $P<0.05$).

สรุป : การใช้ห่วงอนามัยชนิดที่มีทองแดงมีการปรับเปลี่ยนความเป็นกรด-ด่างในช่องคลอด และพบแบคทีเรียลวาไจโนซิสได้บ่อยขึ้นในกลุ่มที่ใช้ห่วง



27th Scientific Meeting of
The Royal Thai College of Obstetricians and Gynaecologists

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The 23rd Asian & Oceanic Congress of Obstetrics & Gynaecology
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WELCOME MESSAGE FROM CONGRESS CHAIRMAN

Sawasdee krub!

On behalf of the Royal Thai College of Obstetricians and Gynaecologists and The Asia and Oceania Federation of Obstetrics and Gynaecology – it is with pleasure and honor that we invite you to Bangkok for the 23rd Asian and Oceanic Congress of Obstetrics and Gynaecology, to be held from 20-24 October 2013 at the Centara Grand & Bangkok Convention Centre at CentralWorld, Bangkok.

In pursuit of the federation's aims to disseminate knowledge and skills and promote discussions on important issues relevant to our field, the theme of AOCOG 2013's scientific programme will be "Challenges in Women's Healthcare." The programme will cover a range of topics including Maternal-Fetal Medicine, Reproductive Medicine, Gynaecological Oncology, General Gynaecology, General Obstetrics, Endoscopic Surgery, Urogynaecology, and Reproductive Health. The lectures and sessions shall be facilitated by the best researchers and clinicians thus ensuring a world-class and quality conference experience for all.

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We look forward to welcoming you to Bangkok for AOCOG 2013!

Sincerely,

Prof. Somboon Kunathikom
Chairman, Organizing Committee
AOCOG 2013

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- Genital Prolapse
- Urinary Incontinence
- Overactive Bladder

Reproductive Health

- Adolescent Problems
- AIDS/HIV Infection
- Unsafe Abortion
- Domestic Violence

IMPORTANT DATES:

Online Abstract Submission opens:	1 November 2012
Abstract Submission Deadline:	20 April 2013
Acceptance Notification:	15 May 2013
Early-bird Registration Deadline:	20 July 2013
Pre-registration Deadline:	15 October 2013
Congress Dates:	20 – 24 October 2013