

Short Communication

A study on the relationship between intrauterine device type and processing period and reproductive tract infections

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Received 19 August 2016

Accepted 16 January 2019

Abstract. The intrauterine device (IUD) has corresponding side effects including reproductive tract infectious diseases, irregular vaginal bleeding, menoxenia, lower abdominal pain, pain in the lumbosacral region and ectopic gestation. A prior study conducted by Bhatia and Cleland reflected that contraceptive usage was one of the factors that influence the occurrence of RTIs in South India. Although many studies have been conducted in various parts of different countries with the aim to document the prevalence of RTIs and its risk factors, there remains a lack of sizable literature for Chinese women who use specific IUDs. Therefore, we conducted an analysis on the relationship of IUD type and processing period with the occurrence rate of RTI.

Keywords: Intrauterine device, reproductive tract infections, occurrence rate

1. Patients and methods

A retrospective analysis was conducted using clinical data obtained from 1,350 patients who received IUD removal surgery at our hospital from January 2013 to June 2016. All patients without menopause, except menstruation, underwent removal surgery within 3–7 days; while patients with menopause had no specific time requirement for surgery. Before the operation, sexual intercourse and a tub bath were prohibited; and the pelvic examination of gynecology, routine examination and pelvic cavity color ultrasonography were conducted. The age of these patients ranged within 24–66 years old, with an average age of 42.5 years.

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Patients were divided into group A and group B, depending on whether the removed IUD had a tail. Group A comprised of 610 patients who had IUDs with a tail fiber. Patients in group A were further divided into two subgroups according to the processing period: group A1 comprised of 286 patients with a processing period of ≥ 10 years; group A2 comprised of 324 patients with a processing period of < 10 years. Group B comprised of 740 patients who had IUDs without a tail fiber. Group B was also further divided into two subgroups according to the processing period: group B1 comprised of 415 patients with a processing period of ≥ 10 years; group B2 comprised of 325 patients with a processing period of < 10 years. Furthermore, in order to study the association of age, pregnancy times and menopause with RTIs, the group A1 was further divided into several subgroups. (1) Age: Patients in group A1 were 32–61 years old. These patients were divided into three groups according to age categories: 32–40, > 40 –50 and > 50 –61 years old; (2) Pregnancy times: group A1 was divided into three groups: patients with one-time pregnancy, patients who were pregnant for the second time, and patients who were pregnant for the third time; (3) Menopause: Patients in group A1 were divided into two groups according to menopause condition: patients with menopause group and patients without menopause group.

The contraindications of IUD removal were excluded according to examination results. The routine examination method was as follows: diagnosis of bacterial vaginosis, Wolf vaginal candidiasis and *Trichomonas vaginalis*.

Statistical analysis. SPSS17.0 statistical software was used to analyze the data. The *t*-test was also used. $P < 0.05$ was considered statistical significant.

2. Results

The relationship of tailed IUDs and tail-less IUDs with the occurrence rate of RTIs. The rate in group A was higher than in group B, and the difference was statistically significant ($P < 0.05$).

The relationship of tailed IUDs and processing period with the occurrence rate of RTIs.

The rate in group A1 was significantly higher than in group A2, and the difference was statistically significant ($P < 0.05$). The difference in the occurrence rates of bacterial vaginosis and vulvovaginal candidiasis between these two groups was statistically significant ($P < 0.05$). However, the difference in the occurrence rate of trichomonas vaginitis between these two groups was not statistically significant ($P > 0.05$, Table 1).

The relationship of tail-less IUDs and processing period with the occurrence rate of RTIs.

The rate in group B1 was slightly higher than in group B2, and the difference was not statistically significant ($P > 0.05$). The difference in the occurrence rate of bacterial vaginosis, vulvovaginal candidiasis and trichomonas vaginitis between these two groups was not statistically significant ($P > 0.05$, Table 2).

The relationship of the occurrence of RTIs with age, pregnancy times and menopause.

The relationship between age and the occurrence of RTIs.

Statistics were conducted for the occurrence rate of RTIs of patients in different groups. Results revealed that the difference among groups was not statistically significant ($P > 0.05$).

The relationship between pregnancy times and the occurrence of RTIs.

Patients in group A1 were divided into three groups: patients with one-time pregnancy, patients who were pregnant for the second time, and patients who were pregnant for the third time. Results revealed that pregnancy times have no significant relationship with the occurrence rate of RTIs (Table 3).

The relationship between menopause and the occurrence rate of RTIs.

Table 1
Reproductive tract infections of patients in the tailed groups

Infection type	Group	Infections [patients (%)]	χ^2	<i>P</i>
Reproductive tract infection	A1	97 (33.9)	5.086	0.024
	A2	54 (14.3)		
Pelvic inflammatory diseases	A1	25 (8.7)	1.739	0.083
	A2	16 (4.9)		
Cervicitis	A1	14 (4.9)	4.591	0.032
	A2	6 (1.9)		
Vaginitis	A1	58 (20.3)	6.477	0.021
	A2	32 (9.9)		
Bacterial vaginosis	A1	37 (12.9)	4.218	0.035
	A2	23 (7.1)		
Vulvovaginal candidiasis	A1	15 (5.2)	4.706	0.030
	A2	6 (1.9)		
Trichomonas vaginitis	A1	6 (2.1)	2.480	0.067
	A2	3 (0.9)		

Table 2
Reproductive tract infection of patients in the tail-less groups

Infection type	Group	Infections [patients (%)]	χ^2	<i>P</i>
Reproductive tract infection	B1	86 (20.7)	1.207	0.743
	B2	55 (16.9)		
Pelvic inflammatory diseases	B1	28 (6.7)	1.584	0.669
	B2	19 (5.8)		
Cervicitis	B1	11 (2.7)	2.361	0.574
	B2	7 (2.2)		
Vaginitis	B1	47 (11.3)	1.495	0.618
	B2	29 (8.9)		
Bacterial vaginosis	B1	33 (8.0)	1.062	0.955
	B2	19 (5.8)		
Vulvovaginal candidiasis	B1	9 (2.2)	1.002	0.996
	B2	7 (2.2)		
Trichomonas vaginitis	B1	5 (1.2)	1.946	0.738
	B2	3 (0.9)		

Table 3
Reproductive tract infections in groups of different ages, pregnancy times and menopause conditions

Baseline information	Reproductive tract infections (patients)		Positive rate (%)
	Positive	Negative	
Age (years)			
32–40	27	51	34.6
40–50	38	61	38.4
> 50–61	32	77	29.4
Pregnancy times			
1	22	61	26.5
2	42	70	37.5
≥ 3	33	58	36.3
Menopause condition			
No	58	101	36.5
Yes	39	88	30.7

Patients in group A1 were divided into two groups according to menopause condition: patients with menopause group and patients without menopause group. Results revealed that menopause was not significantly correlated with the occurrence rate of RTIs (Table 3).

3. Discussion

IUD is beneficial because it is safe, effective, convenient and reversible. It is a form of operation in the uterine cavity, so it has certain adverse effects, such as e.g. uterine infection, uterine bleeding, and uterine perforation [1–4]. The tailed IUD has a tail fiber attached to the end of the intrauterine device, which is kept to 2 cm outside the cervix for providing convenient access for the removal of IUD. It can furthermore check the location of the IUD and see whether there is any infection of the tail fiber to the incidence of genital tract infection [5]. This study found that the occurrence rate of RTIs for tailed IUDs in group A was 23.4%, and the occurrence rate of RTIs for tail-less IUDs in group B was 19.0%. The rate in group A was higher than in group B, and the difference was statistically significant ($P < 0.05$). The occurrence of RTIs in women using tailed IUDs for ≥ 10 years was 33.9%, while the occurrence of RTIs in women using tailed IUDs for < 10 years was 14.3%; and the difference was statistically significant ($P < 0.05$). The occurrence of RTIs in women using IUDs without a tail fiber for ≥ 10 years was 20.7%, while occurrence of RTIs in women using IUDs without a tail fiber for < 10 years was 16.9%; and the difference was not statistically significant ($P > 0.05$). The high occurrence of RTIs in women using tailed IUDs for long periods was not significantly correlated to age, pregnancy times and menopause. Furthermore, the occurrence of RTIs was low in elder older women (29.4%), women with few pregnancy times (26.5%), and women in menopause (30.7%). However, the difference among the above groups was not statistically significant ($P > 0.05$). It follows that the occurrence of RTIs of tailed IUD is higher than the tail-less IUD. In addition, the occurrence of RTIs may rise in women using tailed IUDs for long periods. Therefore, women taking IUDs should be informed by the medical staff on the device type, visiting time and effective period, and should improve the technical level of IUD placement, in order to avoid nosocomial infection and effectively prevent RTIs caused by IUDs.

Conflict of interest

None to report.

References

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