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Original research article

Intrauterine device use in an urban university clinic: safety of use in a population at high risk for sexually transmitted infections☆,☆☆

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Abstract

Objective: The objective was to describe infection rates after intrauterine device (IUD) placement at an urban teaching hospital that did not restrict IUD eligibility based on risk factors for sexually transmitted infections (STIs).
Methods: We reviewed charts of patients undergoing IUD placement at the University of Chicago obstetrics and gynecology resident clinic from July 2007 to June 2008 (n=283). The primary outcome was diagnosis of pelvic inflammatory disease (PID) within 12 months.
Results: Almost half (49.5%) of patients reported a history of any STI. Two patients (0.7%) were diagnosed with PID.
Conclusion: Postplacement infection in this unrestricted population was infrequent and comparable to reported rates in previous studies.
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1. Introduction

Though multiple studies have demonstrated the high efficacy and low complication rate associated with modern intrauterine devices (IUDs), many practitioners and patients continue to have misconceptions about their safety, especially regarding risk of pelvic inflammatory disease (PID) [1,2]. Upper genital tract infection with modern IUDs is infrequent, and current guidelines support offering IUDs to almost all women, including nulliparous women and adolescents [3,4].

Concerns about the safety of the IUD have limited its use in all women, but especially those women considered to be high risk for sexually transmitted infections (STIs) — i.e., patients who have a history of an STI, multiple sexual partners or are under the age of 26 years [3,5], and there is a scarcity of data regarding IUD use in such populations. The purpose of this study was to evaluate the safety of IUDs in a clinical setting that did not impose restrictions on candidates for IUD placement.

2. Materials and methods

We performed a medical chart review of an urban, resident-training obstetrics and gynecology clinic at the University of Chicago Medical Center (UCMC). Patients who underwent placement of a 52-mg levonorgestrel-releasing IUD (LNG-IUD) from July 1, 2007, through June 1, 2008, were identified using billing databases, and medical records were reviewed. We included women whose primary indication for placement was contraception and excluded women for whom there was no available record or insufficient data to confirm IUD placement. We had planned to include women who underwent placement of the copper T380A IUD (CuT380A), but the number of women was too small to allow meaningful analysis. The Institutional Review Board at UCMC approved this study.

The first author (R.D.) extracted the following variables from paper medical records (which had been copied and stored electronically) and the billing database: demographics, history of STIs, IUD type, uterine size and resident training year.

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Microbiology results were obtained from the electronic medical record. Routine clinic practice included performing STI testing at the time of placement or within 1 month prior. There were no established restrictions on candidates for IUD placement based on age, parity or STI risk factors. Women were offered a postplacement visit if desired but were not required to return for follow-up care. We reviewed medical and scheduling records to identify care provided within the UCMC system up to 12 months postplacement at all potential follow-up access points, including primary care or emergency departments.

Our primary outcome was diagnosis of PID. For all patients given this diagnosis by their medical provider, we reviewed the medical record to ensure that minimum criteria established by the Centers for Disease Control and Prevention were present [5]. Secondary outcomes were expulsion, perforation, pregnancy, pain, heavy bleeding and continuation.

We used descriptive statistics to determine baseline characteristics and complaint and continuation rates. We used bivariate analysis to compare women who experienced expulsion to those who did not and considered a p value $< .05$ statistically significant for all comparisons. We used Stata/SE, version 10.1 for Windows (StataCorp LP, College Station, TX) for data analysis.

3. Results

We identified 348 patients with IUD placements during the study period: 34 were excluded for noncontraceptive indication, and 14 were missing documentation to confirm placement. We then excluded 16 women with placement of the CuT380A and 1 woman for whom the type of IUD could not be determined. Of the 283 patients in this analysis, 140 (49.5%) reported a history of any STI and 6 (2.1%) a history of PID. Mean age was 25.7 years, and 13.8% of participants were teens (aged 13–19 years) (Table 1).

The majority, 93.6% (265/283), underwent preplacement STI testing, 90.9% of which were performed on the day of placement. Of these tests, 2.3% (6/265) were positive for chlamydia and 0.8% (2/265) were positive for gonorrhea. After placement, a follow-up contact in the UCMC system was documented for 73.1% (207/283) (Table 2). Two patients (0.7%) were diagnosed with PID, confirmed by chart review. Both women had a history of chlamydial infection, but neither had prior PID. One had a positive gonorrhea test on placement and returned to clinic 3 days later with clinical evidence of PID. The other patient had negative STI testing on the day of placement. She was diagnosed with PID 39 days after placement, which was 2 days after the IUD had been removed for pain and vaginal bleeding.

The rate of reported complaints regarding the IUD was 17.7% (50/283). Fifteen (5.3%) women experienced expulsion. There were no statistically significant differences in expulsion based on age, weight, body mass index, year of resident training or uterine size. The continuation rate was 85.2% (241/283).

Table 1
Participant characteristics and insertion-related variables.

Characteristic	*N*=283
Age (years)	
Mean±SD	25.7±6.2
Range	13–43
Race/ethnicity	
Non-Hispanic Black	253 (89.4)
Hispanic/Latina	17 (6.0)
Non-Hispanic White	5 (1.8)
Missing	8 (2.8)
Weight (lb)	
Mean±SD	183.7±51.7
Range	91–421
Body mass index (kg/m^2)	
<18.5 (underweight)	5 (1.8)
18.5–24.9 (normal)	53 (18.7)
25–29.9 (overweight)	80 (28.3)
>30 (obese)	124 (43.8)
Missing	21 (7.4)
Relationship status	
Single	235 (83.0)
Married or other	41 (14.5)
Missing	7 (2.5)
Parity	
Nulliparous	7 (2.5)
Primiparous (1 birth)	103 (36.4)
Multiparous (≥2 births)	173 (61.1)
History of STI	
Yes, any prior STI[a]	140 (49.5)
Chlamydia	100 (35.3)
Gonorrhea	35 (12.4)
Trichomoniasis	41 (14.5)
PID	6 (2.1)
Other	22 (7.8)
No prior STI	135 (47.7)
Missing	8 (2.8)
Uterine size, by sounding at the time of IUD insertion (cm) (mean±SD)	7.7±1.1
Training level of provider	
1st-year resident	39 (13.8)
2nd-year resident	63 (22.3)
3rd-year resident	87 (30.7)
4th-year resident	82 (29.0)
Fellow or faculty	4 (1.4)
Missing	8 (2.8)

Data are expressed as *n* (%) unless otherwise specified. SD, standard deviation.
[a] Total percentages of types of STIs sum to greater than total (49.5%) because some participants reported more than one prior type of STI.

4. Discussion

This study supports existing evidence that IUDs are safe [3]. Although STI positivity at time of placement was lower than expected, nearly half of our subjects had a history of STIs, half were under age 26, and most described themselves as single — characteristics that have been considered high risk for infection. The overall diagnosis of PID after placement (0.7%) was low. This finding is consistent with the literature [6–8] and provides further evidence for IUD safety given that our study population can be characterized as high risk based on epidemiological data. Indeed, the

Table 2
Reported complaints and follow-up to 12 months after LNG-IUD placement.

Complaint	*N*=283
Any[a]	50 (17.7)
Expulsion	15 (5.3)
Pain	18 (6.4)
Heavy bleeding	10 (3.5)
PID	2 (0.7)
Pregnancy[b]	2 (0.7)
Other	21 (7.4)
Perforation	0 (0)
Follow-up within 1 year	
Any	207 (73.1)
Up to 3 months of follow-up	76 (26.9)
3–6 months of follow-up	33 (11.7)
6–9 months of follow-up	40 (14.1)
9–12 months of follow-up	58 (20.5)

Data are expressed as *n* (%).

[a] Individual complaints sum to greater than total (17.7%) because some women experienced more than one complaint.

[b] Neither pregnancy occurred with intrauterine device in situ.

catchment area of the study clinic includes neighborhoods with some of the highest incidence rates of chlamydia and gonorrhea in Chicago according to surveillance conducted by the city of Chicago during the time frame of our study [9]. Our findings thus highlight the limitations of using population-level data as the primary source of information with which to evaluate risk of STIs. Additionally, our study supports the practice of same-day placement of IUDs, as over 90% of placements occurred on the same day as STI testing. This practice is also supported by a recent cohort study among 272 women presenting for emergency contraception at an urban family planning clinic [10]. That study compared women who received same-day IUD placement to women who did not and found that the diagnosis of PID was low in both groups and was not statistically different between groups.

Although more than one third of placements were performed by junior residents, the rate of IUD expulsion (5.3%) is within the range reported in prior studies [3,8,11,12]. Expulsion was not associated with any of the variables we analyzed, but we were unable to assess whether expulsion was associated with parity due to the small number of nulliparous patients in our sample. Two recent studies have found higher incidence of expulsion among parous women compared to nulliparous women [11,12]. Our 12-month IUD continuation rate (85.2%) is similar to rates observed in large cohort studies [8,13].

This study is limited by its retrospective design and lack of required follow-up. In a retrospective chart review of this nature, lack of follow-up is difficult to interpret. Patients were not required to schedule return visits, nor was there a protocol in place to routinely contact patients after placement. Thus, no further contact within a year may indicate no complaints, unreported complaints without further care or complaints with care at another institution. Thus, the study design and clinic practice limited our ability to confirm healthy status in all women who received an IUD.

Another limitation is the older dataset, i.e., data were collected in 2007–2008. Nonetheless, data remain relevant because the characteristics of the patient population considered high risk for STIs have not changed significantly since that time. Additionally, the study is limited by examination of a single type of IUD, the 52-mg LNG-IUD, and results cannot be generalized either to other LNG-IUDs or to copper IUDs.

Finally, the small number of nulliparous women limits our study. Although the clinic did not restrict IUD placement to parous women, only seven women (2.5%) were nulliparous, and we cannot extrapolate results to nulliparous women. Thus, while our study is reassuring for women with other high-risk characteristics, it does not speak to safety of the IUD in nulliparous women. However, a recent study of a new 52-mg LNG-IUD did include 1011 (58%) nulliparous women and reported a similarly infrequent overall 1-year rate of PID of 0.5%, although that study did not stratify diagnosis of PID by parity nor did it include information on prior STIs or PID [11].

In order to increase women's contraceptive choices and reduce the rate of unintended pregnancy, expanding IUD access should be a public health priority [13]. Decreasing physician and patient anxiety about the risks of IUDs is paramount to achieving that goal. This study adds additional support to the current literature that IUD use should be considered in all patients seeking long-term nonpermanent contraception regardless of risk factors for STIs.

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