Complications Associated with IUD Use in a Family Practice Setting

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This study compares the complication rate of intrauterine contraceptive devices (IUD) with other contraceptive measures in a residency practice. The study population included 220 randomly selected women who had IUDs inserted by residents over a five-year period. One hundred similarly selected women started on birth control pills (BCP) were used as a control group.

Of the IUD patients, 8.6 percent developed pelvic inflammatory disease vs 2 percent of the BCP patients. The incidence of gonorrhea was not significantly different between the two groups: 8.2 percent for the IUD group vs 7 percent for the BCP group. Discontinuation of IUDs for reasons other than desiring pregnancy was significantly higher than discontinuation of BCPs: 41 percent vs 12 percent. Of the total IUD insertions, there were 21 expulsions (10 percent) and one uterine perforation (0.4 percent). Five pregnancies occurred in the IUD group, yielding a pregnancy rate of 1.7 per 100 women-years. There was a four percent rate of gynecologic hospitalizations in the IUD group as contrasted with one percent rate in BCP group.

IUD use in the family practice setting under study is associated with comparatively poor long-term acceptance and a relatively high rate of complications.

The current literature regarding complications associated with the use of intrauterine contraceptive devices (IUDs) reveals some lack of agreement. Complication rates have varied widely from author to author and among differing populations.[1-5] Wilson and Ledger, comparing an indigent to a private population, found rates of pelvic infections of 7.7 percent for the indigent group and 1.9 percent for the private group with similar variations in other complications.[6] Reported rates of pelvic inflammatory disease among IUD users have ranged from zero to eight percent.[1-8] Rates of continuation, perforation, bleeding abnormalities, and expulsions have similarly varied. Few studies have included a control population. No reports have studied a population served in a family practice residency setting.

The purpose of this study was to define the complication rate associated with the use of IUDs in one residency practice, particularly when compared to oral contraceptive use. It is hoped that this report will be a stimulus for similar studies in other family practice residencies.

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Materials and Methods

This study was conducted in Cedar Rapids, Iowa, a conservative midwestern city with a greater metropolitan population of approximately 150,000. Three colleges are located within the city. Ninety percent of the population is Caucasian. Eight to ten percent of the population is considered indigent.

The patients under study were generated from two sources: (1) the Family Practice Center, which is the Cedar Rapids Family Practice Residency's Model Office; and (2) the Family Health Center, which functions as the major family planning clinic for the metropolitan area. Economically, the Family Practice Center practice is 60 percent self-pay, 30 percent Medical Assistance, and 10 percent Blue Cross or Medicare. (Figures from the Family Health Center are not available.) In general, the gynecologic population in the two groups is young, Caucasian, and otherwise healthy.

The study population included 220 randomly selected women from a total pool of approximately 1,200 who had IUDs inserted between January 1, 1972 and May 1, 1977 by residents in the Cedar Rapids Residency Program. Patients were excluded if they had not been seen in follow-up within the last two years. One hundred similarly selected women started on birth control pills (BCP) during the same period were used as a control group. Ten BCP patients and 37 IUD patients were excluded from the study because of lack of follow-up.

The average age of the IUD patients (Family Health Center and Family Practice Center combined) was 24.1 years vs 20.9 years for the BCP patients. The ratio of Caucasian/Black/Indian was 92/6/2 percent for the IUD group and 95/5/0 percent for the BCP group. Concerning parity, in the IUD group, 32 percent were nulliparous, 31 percent primiparous, and 37 percent multiparous. Of the BCP patients, 60 percent were nulliparous, 28 percent primiparous, and 12 percent multiparous. Fifty percent of the IUD patients were married, 32 percent single, and 18 percent divorced or separated. In comparison, 32 percent of the BCP patients were married, 62 percent single, and 6 percent divorced or separated. Thus, considerably more of the BCP group were nulliparous and unmarried.

A total of 239 IUD insertions were performed, all by family practice residents. Of the IUDs used, 198 were Copper-7, 30 Lippes Loop, 7 Dalcon Shields, 3 progestaserts, and 1 safety coil. (All of the Dalcon Shields were subsequently removed.) The IUD patients represent 3,443 women-months of use or 287 years. This is an average of 1.3 years per patient. Comparatively, the BCP group was followed for 2,318 months or 193 women-years, an average of 1.9 years per patient. Including pill switching, 45 patients were on Ortho-Novum 1/50, 18 on Ortho-Novum 1/80, 14 on Loestrin, 11 on Ovulen, 9 on Ovral, 5 on Norinyl 1.0 mgm, 4 on Modicon, 3 on Demulen, 2 on Lo-Ovral, and 2 on Enovid-E.

All charts were reviewed retrospectively by the authors. Specific complications reviewed included pelvic inflammatory disease, bleeding irregularities, pelvic pain, perforations, expulsions, pregnancy, and gynecologic hospitalizations. Chi-square analysis was utilized as the statistical means.

Results

Pelvic Inflammatory Disease

A significantly higher incidence of pelvic inflammatory disease occurred in the IUD group compared to the BCP group. There were 19 cases of pelvic inflammatory disease in the IUD group, or 8.6 percent, vs two cases (2 percent) in the BCP group ($P<0.01$). Furthermore, four of the 19 IUD patients required hospitalization whereas all of the BCP patients responded to outpatient therapy. In spite of the significant difference in the rate of pelvic inflammatory disease, the rate of gonorrhea was not significantly different between the two groups: 8.2 percent of the IUD users vs 7 percent of the BCP group.

The average time interval between IUD insertion and development of pelvic inflammatory disease was ten months. Five of the 19 cases of pelvic inflammatory disease developed within the first three months after insertion. One of these five patients had a positive gonorrhea culture at the time of insertion. The longest time interval between insertion and the development of pelvic inflammatory disease was 32 months.

The 19 IUD users with pelvic inflammatory disease were analyzed with respect to age, parity, and marital status (Table 1). As one would expect,

Table 1. Pelvic Inflammatory Disease (PID) Among IUD Users

	Total Number	PID Number	PID Percent
Age			
14-19 years	38	4	10.5
20-25 years	114	11	9.6
26-30 years	47	4	8.5
Over 30 years	21	0	.0
Total	220	19	8.6
Parity			
Nulliparous	71	7	9.9
Primiparous	69	4	5.6
Multiparous	80	8	10.0
Total	220	19	8.6
Marital Status			
Single	71	11	15.5
Married	109	7	6.0
Divorced or Separated	40	1	2.0
Total	220	19	8.6

the incidence of pelvic inflammatory disease decreased with increasing age; 10.5 percent in the 14 to 19-year age group, 9.6 percent for the 20 to 25-year age group, 8.5 percent for the 26 to 30-year age group, and zero percent for the greater than 30-years age group. The rate of pelvic inflammatory disease was significantly less in married (6 percent) than in single (16 percent) IUD users ($P<0.005$). In this study, there was no clear relationship between the rate of pelvic inflammatory disease and parity: 9.9 percent for nulliparous patients, 5.6 percent for primiparous patients, and 10 percent for multiparous patients.

Bleeding Abnormalities

For the purpose of this study, menorrhagia, oligomenorrhea, metrorrhagia, and intermenstrual bleeding were considered bleeding abnormalities. Forty-six (21 percent) of the IUD users experienced a bleeding abnormality severe enough to be brought to the physician's attention compared to 17 (17 percent) of patients on BCP (NS). However, 23 patients (11 percent) discontinued IUD use secondary to bleeding vs 4 (4 percent) of the BCP group ($P<0.01$) (Table 2).

Pelvic Pain (Excluding Pelvic Inflammatory Disease)

Thirty-eight (17 percent) of the IUD users experienced pelvic pain significant enough to seek medical attention, compared to one patient (1 percent) on BCPs ($P<0.01$). Seventeen of the 38 IUD users experiencing pain had their IUD removed for that reason, which represents eight percent of the total number of IUD users (Table 2).

Expulsions

Twenty-one expulsions (either total or plastic tip protruding through the cervical os requiring removal) occurred in the 220 insertions, yielding a ten percent primary expulsion rate (Table 2). Of the 21 primary expulsions, eight patients under-

Table 2. IUD Complications and Discontinuations
(220 Total Patients)

Complication	Number of Complications	Percent of Total	Number of Discontinuations	Percent of Total
Bleeding Abnormality	46	21	23	11
Pelvic Pain	38	17	17	8
Expulsed (Primary)	21	10	14*	6
Pelvic Inflammatory Disease	19	9	19	9
Pregnant (With IUD in Place)	5	2	5	2
Other**	12	5	12	5
	141	64	90	41

*IUD expulsed and not replaced.
**Other includes: 1 gonorrhea septicemia, 2 partner intolerance, 2 other birth control methods desired, 2 could not find string, and 5 no reason given in record.

went IUD reinsertions with only one reexpulsion. The incidence of expulsion was significantly related to parity when comparing nulliparous patients to others (Table 3). Eighteen percent of nulliparous patients expulsed their IUDs, vs 5.6 percent of the primiparous patients, and 5 percent of the multiparous patients ($P<0.025$). There was no significant difference in expulsion rates between primiparous and multiparous patients.

Pregnancy

Five pregnancies occurred in the IUD group, including one ectopic and one spontaneous septic abortion, yielding a pregnancy rate of 1.7 per 100 women-years (Table 2). There were two (two percent) pregnancies in the BCP group, only one of which occurred while the patient was on BCPs. The other pregnancy resulted when the patient discontinued her BCPs. The effective pregnancy rate among patients started on BCPs was 1.03/100 women-years, whereas the pregnancy rate of patients actually taking the BCP was 0.5/100 women-years.

Perforations

Of 239 total IUD insertions, one perforation occurred. This perforation occurred during sounding of the uterus and was recognized prior to insertion of the IUD. The patient was placed on antibiotics and followed carefully as an outpatient without developing serious sequela.

Long-Term Acceptance

The overall rate of discontinuation of IUDs was significantly higher than discontinuation of BCPs: 45 percent (99/220) vs 13 percent (13/100) ($P<0.05$). As noted previously, reasons for terminating IUD use were: 23 for bleeding abnormalities, 19 for pelvic inflammatory disease, 17 for

Table 3. IUD Expulsions

	Total Number Inserted	Expulsed Number	Expulsion Percent
Nulliparous	71	13	18
Primiparous	69	4	6
Multiparous	80	4	5
Total	220	21	10

pelvic pain, 14 were expulsed and not replaced, 5 for pregnancy, 2 desired another form of birth control, 2 for partner discomfort, 2 for inability to find string, 1 for gonococcal septicemia, 5 for unspecified reasons, and 8 for desired pregnancy (Table 2). The average duration between insertion and discontinuance was 8.5 months. When IUD discontinuation is broken down by parity and age, no trends emerge.

The 13 patients who discontinued the BCP did so for the following reasons: three for bleeding, one for rest period, one for headache, one for a tubal ligation, one for dysmenorrhea, one for desired pregnancy, and five for unstated reasons.

Hospitalizations

There were nine gynecologic and obstetric hospitalizations in the IUD group (four percent) compared to one (one percent) in the BCP group (NS). The IUD patients hospitalized included four patients with pelvic inflammatory disease, one with a ruptured ectopic pregnancy, one with a spontaneous septic abortion, one with menometrorrhagia, one with a lost IUD secondary to a broken string (string broke during attempted removal) for dilatation and curettage removal, and one with gonococcal septicemia. This is a rate of 3.2 hospitalizations per 100 women-years of use. In the BCP group there was one admission for an abortion. This patient became pregnant after missing several consecutive pills. Although there is no statistical difference in the hospitalization rates (likely due to the relatively small number of overall admissions), a clear difference is implied.

Discussion

An attempt has been made to define IUD complications and discontinuation rates experienced in a family practice residency patient population. A similar population of BCP users was used as a control group. A basic assumption was made that the two groups would have similar sexual activity levels.

Several possible weaknesses are recognized in this study. First, the BCP population tended to be younger with a higher percentage being single and nulliparous. Secondly, by eliminating patients not seen in follow-up within the last two years, the rate of complications may be slightly overestimated since patients with a complication are more likely to return for follow-up. However, even if the 37 IUD patients and the ten BCP patients excluded for lack of follow-up were included, the findings are still significant. Thirdly, a retrospective study such as this is never as controlled as a prospective study might be. Fourthly, in reviewing the charts, no attempt was made to retrospectively verify the clinical diagnosis of pelvic inflammatory disease. However, approximately one third of the cases of pelvic inflammatory disease were gonococcal (proven by positive culture), which correlates with the reported average percent of cases of pelvic

inflammatory disease which are gonococcal.[9] If pelvic inflammatory disease was overdiagnosed, one would expect to have a lower percentage of gonococcal pelvic inflammatory disease. Finally, it is realized that the population under study is young and sexually active and perhaps less comparable to a broad-based private family practice.

Despite the above, several key facts emerge. The eight percent rate of pelvic inflammatory disease in the IUD group is alarming. Not only is pelvic inflammatory disease a potentially serious disease, but its long-term sequela of sterility has to be considered. This is a higher rate of pelvic inflammatory disease than reported in most other studies.[1-7] This is partially explainable by the young, sexually active population with an underlying two percent rate of pelvic inflammatory disease in the control group. Technically poor, unsterile insertion techniques would appear not to be a factor, since 12 of 19 cases of pelvic inflammatory disease occurred more than three months after insertion.

Long-term acceptance of the IUD was poor. During the five-year period studied, 45 percent of IUD users chose to discontinue this form of birth control. If those patients desiring pregnancy are not considered, the percentage would still be 41 percent.

Perhaps the most alarming finding was the four percent of IUD users (nine patients) hospitalized for gynecologic and obstetrical problems. Seven of nine of these hospitalizations were for serious illnesses and the other two hospitalizations subjected the patient to a surgical procedure (both dilatation and curettage). Seven of the hospitalizations appear at least partially related to the use of an IUD: four cases of pelvic inflammatory disease, one spontaneous septic abortion, one lost IUD for dilatation and curettage, and one menometrorrhagia. The other two hospitalizations were for gonococcal septicemia and a ruptured ectopic pregnancy. Overall, the hospitalization rate among the IUD users for obstetrical/gynecological problems was 3.2/100 women-years of use. This is considerably higher than Kahn's estimated national average of 3 to 10/1,000 women-years of IUD use.[10]

The rate of bleeding abnormalities (21 percent) and pelvic pain (17 percent) found in this study are comparable to other studies. Although neither problem is generally serious or life threatening, they were frequent and annoying complaints and resulted in the eventual removal of a large number of IUDs because of patient dissatisfaction.

The rate of uterine perforation (1/239 insertions) is within reported rates but higher than most. Wilson and Ledger reported a perforation rate of 1/236 insertions compared to 1/2,000 insertions reported by Nobel.[2,11]

Conclusion

It is concluded that IUD use in the family practice setting under study is associated with poor long-term acceptance and a relatively high rate of complications, some of which are serious and life threatening. It would seem imprudent and unwise to routinely subject otherwise healthy young women to these risks without careful consideration of the available alternatives. Both the patient and the family physician need to be fully aware of the complications and risks associated with IUD use, particularly when dealing with a young, sexually active population.

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