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Original Studies

The Impact of Using Emergency Contraception on Reproductive Health Outcomes: A Retrospective Review in an Urban Adolescent Clinic

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Abstract. The effort to make emergency contraception (EC) more easily available has been challenged by concerns that prescribing EC may tempt adolescents to have unprotected intercourse, resulting in higher rates of pregnancy and sexually transmitted infections (STIs). This study examined differences in reproductive health history and outcomes among girls who were prescribed EC compared with those seeking other reproductive health care. In a retrospective chart review, the subjects (182 total: 92 EC, 90 control) were girls aged 13 to 21 years, 63% black and 31% white, in an urban, hospital-based adolescent outpatient clinic. Pregnancies, STIs, and visits for first pelvic examination and Pap smear were compared for the 12 months before the identifying visit (IDV) and for up to 2 years after the IDV (mean: 10.9 months ± 8.2 months). Twenty-six subjects became pregnant with no significant difference between groups. Control subjects were found to have a higher incidence of chlamydia. Before the IDV, EC users were more likely than controls to have never had a pelvic examination (23% vs. 6%, $P < 0.002$) or a Pap smear (24% vs. 6%, $P < 0.002$). However, 80% of EC subjects who had never had a pelvic examination received one as a result of the initial visit and follow-up related to receiving EC. Using EC is not associated with increased risk for future STIs and pregnancy among adolescent girls. Requesting EC may initiate routine gynecologic care.

Key Words. Emergency contraception—Pap smear—Sexually transmitted infections—Postcoital contraception—Adolescent—Reproductive health care—Pregnancy—Routine gynecologic care—Pelvic examination

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Introduction

Over 800,000 adolescent girls between the ages of 15 and 19 become pregnant each year.[1,2] It is estimated that approximately 85% of these pregnancies are unintended.[3] In spite of increased education and availability of various methods of contraception, 35% of adolescents do not use contraception at first intercourse.[4] Of those who use contraception, many use it inconsistently or incorrectly, leading to contraceptive failures. Emergency contraception (EC) can play a critical role in preventing unwanted pregnancy among adolescent girls who are in the process of establishing their contraceptive practices.[4] EC may have a particularly important role for adolescent girls who have recently initiated sexual activity because they are more likely to be sporadic users of contraception.[5]

Adolescents trying to gain access to EC in a timely manner may meet multiple obstacles. Counseling and provision of EC have been challenged by concerns that easy access to EC may encourage unprotected intercourse and decrease ongoing use of more effective contraception.[6,7] Others have suggested that an urgent visit for EC may not only provide an emergency intervention to prevent unintended pregnancy, but also provide an opportunity for an adolescent to obtain her first pelvic examination, be screened for sexually transmitted infections (STIs) and cervical cancer, receive general contraceptive education, and initiate use of an ongoing method of contraception. Even though there may be a substantially higher risk of pregnancy and STIs at the time of initial presentation for EC, health interventions that are part of the EC visit and follow-up can help a young woman to reduce her long-term risk of unintended pregnancy and pelvic

infections. Finer and Zabin showed that adolescent women wait for long periods (mean: 22 months) from the first intercourse to presenting for the first family planning visit.[8] The interval separating first intercourse and the first family planning visit may be shortened by a visit for EC.

This study explores the relationship between EC use and reproductive health history and outcomes. We investigated how two groups of young women (a group who were prescribed EC at an urban, hospital-based adolescent clinic and another who received routine gynecologic care at the same site) differ with respect to pregnancies, STIs, number of lifetime sexual partners, age at first intercourse (coitarche), and the acquisition of an annual pelvic examination and Pap smear. We hypothesized that young women who use EC would not significantly differ from control subjects with regard to their history of pregnancy or STIs. It would be important to know if there were pre-existing differences in pregnancy and STI histories between the groups, because these might account for differences in pregnancies and STIs reported subsequent to an identifying visit (IDV) for EC or routine gynecologic care. Likewise, we hypothesized that young women who use EC would not differ from control subjects in their incidence of pregnancy and STIs following a visit for EC or routine gynecologic care. We also hypothesized that a significant proportion of young women who presented for EC would have had no previous gynecologic care before receiving EC and that the visit for EC would become the impetus for getting more comprehensive reproductive health care, including a pelvic examination and Pap smear.

Methods

Our study took place in an urban, hospital-based outpatient adolescent clinic providing both primary care and reproductive health services under a Title X contract. After receiving approval from the hospital's Institutional Review Board, all clinic log sheets at the adolescent clinic from June 1, 1995, to July 31, 1998, were reviewed for EC use. We reviewed the log sheets for the term "ECP" under the heading of "reason for visit" and for the terms "Ovral" or "Lo/Ovral" under the heading of "treatment". These entries were identified as possible EC visits (Ovral and Lo/Ovral were the most common oral contraceptives used for EC during the timeframe[a]), and each subject's name was recorded on a list of potential EC group subjects. Each subject's age was determined from the birth date in the log. As each EC subject was identified, a control subject, who had a clinic visit within 7 days of the EC subject's IDV, was matched by age with the EC subject. Records for all subjects were obtained and reviewed from two sources: the central medical records department at the hospital and confidential family planning charts that were stored in the adolescent clinic, separate from the medical records of the hospital. All records identified for each subject were requisitioned.

Fig. 1 summarizes the process of selecting the subject charts for the EC and comparison groups. When charts were located, the visit record corresponding to the clinic log data was confirmed and designated as the identifying visit or IDV. For the control group, the IDV was limited to this single visit. However, for the EC group, the IDV included both the visit for obtaining EC as well as an EC follow-up visit (called the identifying visit follow-up or IDVFU, when referred to specifically) at the clinic. We included both the request and follow-up visit as the EC IDV because it more accurately reflected routine care for EC subjects. A 2-week follow-up visit was recommended to patients after EC was prescribed. Because of the difficulty of returning within a strict 14-day period, any visit within 30 days of the EC IDV was considered as an EC follow-up visit. At follow-up, the effectiveness of the EC to prevent pregnancy was confirmed with a urine pregnancy test, adherence to the EC medication regimen was documented, and a pelvic examination and Pap smear were performed; an STI screening was performed if indicated. A pelvic examination, Pap

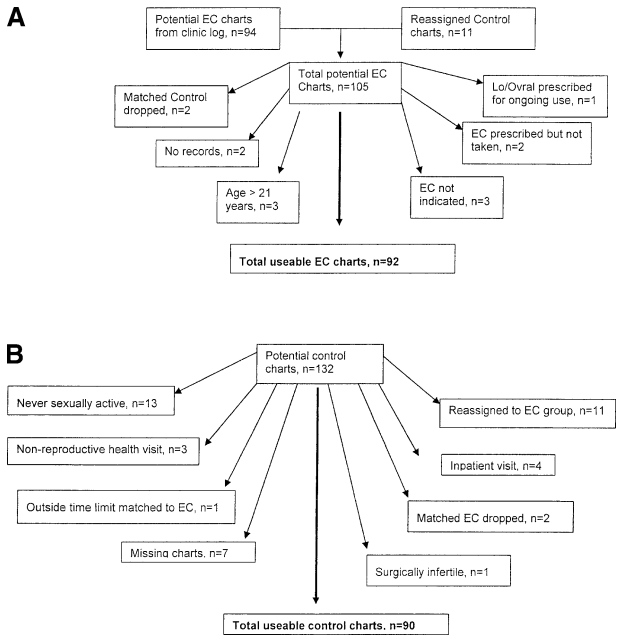

Fig. 1. (a) Exclusion of EC subjects' charts. (b) Exclusion of control subjects' charts.

[a]The timeframe of our study predates the US Food and Drug Administration's approval of Preven in 1998 and Plan B in 1999.[9]

smear, and STI screening were not required for prescribing EC. They were usually deferred to the EC follow-up visit unless a patient exhibited signs or symptoms of an STI at the EC request visit. Acquisition of pelvic examination, Pap smear, and STI screening was attributed to subjects in the control group only if these events occurred at the IDV; for the EC subjects, these events were counted if they occurred at the IDV or the EC follow-up visit.

We recorded pregnancies and STIs that were documented for the 12-month period prior to the IDV and the 24-month period following the IDV for EC and control subjects, and tracked records of each subject's reproductive health care on a visit-by-visit basis. Some subjects had no visits after the IDV (n = 41, 23%); others had five or more recorded over the 24 months (n = 44, 25%). A maximum of five visits was tracked for each subject. To assess the incidence of pregnancy, each chart was examined for every visit prior to the IDV to determine pregnancy data. Both the recorded history and laboratory data, when available, contributed to the assessment of pregnancy for each subject. All records of the tests and their results were verified by reviewing the clinic log for each visit when the testing occurred. Pap smear, gonorrhea, chlamydia, and Trichomonas test results[b] were recorded (when available) for each study subject. The records were examined for the 12 months prior to the IDV, the IDV or IDV follow-up, and the 24 months following the IDV.

Comparison of the EC and Control Groups

The EC and control groups were compared with regard to incidence of pregnancy, STI, and acquisition of first pelvic examination and Pap smear. The two groups were compared 12 months prior to the IDV; at the IDV; and during the 24 months following the IDV. Data were also gathered regarding age at first intercourse, numbers of past pregnancies, number of current and lifetime partners, and pregnancy test results.

Each EC subject's medical record was examined for documentation of EC use. All visit records were examined for documentation of EC prescription, both before and after the IDV. In addition, EC users often had an EC intake form from a visit where EC was prescribed. This form asked the subject whether she had ever used EC before. If the subject reported yes, then this was recorded as past use. Both patient history and documentation of EC prescription by clinicians were used to contribute to overall EC usage history.

[b]Trichomonas infection was diagnosed via wet prep from a vaginal swap. Chlamydia was diagnosed via polymerase chain reaction obtained from the cervix. Gonorhhea was diagnosed from cervical culture grown on Thayer Martin chocolate agar.

Analysis of Data

Data were analyzed descriptively for frequencies, and group differences were analyzed by chi-square tests using the Statistical Package for Social Sciences.[10] Independent samples *t*-tests were used to test group differences in age and coitarche.

Our study sample was large enough to detect all but the smallest effect sizes in pregnancy and STI rates. Using the chi-square test to assess for differences in proportions, with an alpha = 0.05 and power = 0.80, an n of 62 per group would be needed to detect a mean (0.4 vs. 0.65) effect, and an n of 26 per group would be needed to detect a large (0.4 vs. 0.78) effect. To detect the smallest (0.4 vs. 0.5) effect, a sample size of 388 per group would be required.[11]

Results

Characteristics

Nearly two thirds (63%) of the total sample was African American. Our sample reflects the usual ethnic distribution of the adolescent clinic patient population. The EC and control groups did not differ significantly with respect to race. EC and control subjects were effectively matched for age; the mean age of the total sample was 16.8 ± 1.5 years, with a range of 13 to 20 years.

The mean age at first intercourse or coitarche for the entire sample was 14.5 years ± 1.7 years, with a range of 9 to 18 years. The EC and control groups did not differ significantly with respect to coitarche. Only 4% delayed their first intercourse until age 18 or later. The number of lifetime partners ranged from 1 to 40, with a mean of 4.2 ± 5.3, a median of 2, and a mode of 1. There was no difference between the EC and control groups with respect to the number of lifetime partners. The overwhelming majority (81%) stated that they had one current partner at the time of the IDV; 7% reported two partners, and 12% reported no current partners. See Table 1 for a summary of characteristics.

Pregnancy

Of the total sample, 27% of subjects had been pregnant before the IDV. No significant difference was found between EC and control subjects with regards to pregnancy history. At the IDV, positive pregnancy tests were rare: one subject from the EC group and two

Table 1. Characteristics of Participants at Identifying Visit

Characteristic	Total* n = 182	EC Users n = 92	Controls n = 90	*P* value
Age in Years, Mean (SD)	16.8 (1.5)	16.8 (1.5)	16.8 (1.5)	0.90
Coitarche in Years, Mean (SD)	14.5 (1.7)	14.7 (1.8)	14.2 (1.5)	0.09
	N (%)	*N* (%)	*N* (%)	
Race				
African American	114 (65)	53 (30)	61 (35)	
Non–African American	61 (35)	35 (20)	26 (15)	0.26
White	57 (31)	31 (18)	26 (15)	
Hispanic	2 (1)	2 (1)	—	
Biracial	2 (1)	2 (1)	—	
Ever Pregnant	31 (27)	20 (17)	11 (10)	0.08

*Because of missing data, the total n value for each variable varied.

subjects from the control group had a positive pregnancy test.[c] At the IDV follow-up, two EC subjects were pregnant. In the 24 months after the IDV, 14% of the total sample (n = 26) had a positive pregnancy test documented in the chart. EC subjects (n = 16, 17%) were no more likely to have a positive pregnancy test than control subjects (n = 10, 11%, $P < 0.23$).

Sexually Transmitted Infections

No significant differences were found between EC and controls in the prevalence of STIs (Trichomonas, gonorrhea, or chlamydia) either at baseline (the IDV and the 12 months prior) or during any single follow up period during the subsequent 24 months (Table 2). For the 24-month follow-up period as a whole, there was a significant difference between EC and control subjects in the rate of Chlamydia infection. More control subjects (n = 33) were diagnosed with Chlamydia than EC subjects (n = 20, $P = 0.03$). No difference was found between groups for the number of Trichomonas and gonorrhea infections over the 24-month follow-up period as a whole.

Pelvic Examination and Pap Smear Acquisition

Of the total sample, 14% (n = 24) of subjects had never had a pelvic examination, 15% (n = 24) of the subjects had never had a Pap smear; the IDV was the first opportunity for these subjects to obtain these services (Table 3). EC subjects were more likely than control subjects to have never had a pelvic examination (n = 19, 23% for EC; n = 5, 6% for control; $P = 0.002$) or a Pap smear (n = 19, 24% for EC; n = 5, 6% for control; $P = 0.002$). The majority of subjects who had never had a pelvic examination or Pap smear received a pelvic examination (67%) and Pap smear (63%), as well as appropriate STI screening tests at the IDV or IDV follow-up. Of those subjects who had never had a Pap smear or pelvic examination, EC and control subjects were equally likely to obtain them at the IDV and IDV follow-up (80% and 63%, respectively, for pelvic examination; 63% and 60%, respectively, for Pap smear).

[c]The EC subject with a positive pregnancy test at the IDV was 7 weeks postabortion. She had a negative pregnancy test 2 weeks later at her IDV follow-up.

EC Descriptive Data

More than half (52%, n = 48) of the EC group returned for a follow-up visit. Of those returning, 67% came within 2 weeks as recommended; the remainder returned within 4 weeks of receiving their EC. Pregnancy testing was documented at the follow-up visit for 45 subjects in the EC group. Of this group, 4% (n = 2) had a positive urine pregnancy test.

Follow-up

The average length of follow-up for all subjects was 10.8 months ± 8.3 months (mean: 11 months) with a range of 0 to 24 months. Twenty-one percent of the entire sample never returned to the clinic within the 24-month follow-up period; the EC and control group were equally likely to never have another gynecologic visit documented in the 24-month period after the IDV. The first post-IDV visit occurred a mean of 4.6 months after the IDV ± 3.6 months (mean mode: 3 months), with a range of 1 to 18 months.

Discussion

As hypothesized, our data show few differences between EC users and controls in terms of their experiences of pregnancies and STIs either before or after the EC user's identifying visit for EC. No differences were found in the occurrence of pregnancy at any point in the study, suggesting that EC use is neither more common among adolescents who have experienced pregnancies and STIs, nor is its use associated with subsequent higher incidence of pregnancy. One explanation may be that EC is often used as a crisis intervention when another contraceptive method fails. Another explanation may be that the majority of subjects used EC only one time, while using more reliable methods the rest of the time, which would not significantly increase their odds of pregnancy. For sexually active

Table 2. Sexually Transmitted Infections Over Time by Group

	12 mos Before IDV	IDV	1–6 mos After IDV	7–12 mos After IDV	13–24 mos After IDV	Total Cases Over 24 mos	*P* value
Gonorrhea	3 cases (3 EC/0 C)	3 cases (1 EC/2 C)	5 cases (2 EC/3 C)	4 cases (2 EC/2 C)	4 cases (1 EC/3 C)	19 cases (9 EC/10 C)	0.77
Chlamydia	19 cases (7 EC/12 C)	12 cases (5 EC/7 C)	6 cases (2 EC/4 C)	8 cases (2 EC/6 C)	8 cases (4 EC/4 C)	53 cases (20 EC/33 C)	0.03
Trichomonas	11 cases (1 EC/10 C)	5 cases (4 EC/1 C)	11 cases (6 EC/5 C)	6 cases (1 EC/5 C)	10 cases (8 EC/2 C)	43 cases (20 EC/23 C)	0.54

EC, emergency contraception group; C, control group; IDV, indentifying visit; mos, months.

girls who use condoms but experience method failure, EC improves their chance of preventing pregnancy, and may initiate their obtaining gynecologic care. For girls who have initiated sexual intercourse without contraception, EC provides an opportunity to prevent pregnancy after a single act of unprotected intercourse and provides an opportunity to access other care, including counseling about contraception and STI screening.

Reproductive health care providers often struggle with balancing the potential barrier of requiring a pelvic examination at an EC dispensing visit with the possibility of missing a population of EC users who might not follow up in 2 to 4 weeks for STI and cancer screening. First-time family planning patients are potentially the most concerning because they do not have an established rapport with the clinic staff and may have never received screening for STI and cervical cancer or contraceptive counseling. Of all subjects for whom the IDV and IDV follow-up were the first opportunities for a pelvic and Pap smear, EC users and controls were equally likely to obtain the pelvic and Pap smear at this time. Out of 92 EC users, only 7 (7.6%) missed getting their first pelvic and Pap smear because they did not return for follow-up. The Adolescent Clinic protocol at our institution strongly encouraged follow-up 2 weeks after a visit for EC, but we acknowledge that protocols at other health services may vary.

Table 3. Differences in Pelvic Examinations and Pap Smears by Group

	Total n (%)	Control n (%)	EC n (%)	*P* value
Pelvic Examination				
Never had pelvic exam prior to IDV*	24 (14)	5 (6)	19 (23)	0.002
Of these, obtained first pelvic at IDV or IDV follow-up	16 (9)	4 (4)	12 (13)	0.48
Pap Smear				
Never had Pap smear prior to IDV	24 (15)	5 (6)	19 (24)	0.002
Of these, obtained first Pap smear at IDV or IDV follow-up	15 (8)	3 (3)	12 (13)	0.90

EC, emergency contraception; IDV, identifying visit.

*For EC subjects, the IDV is defined as the visit found in the clinic log at which the subject received EC, plus the IDV follow-up visit, which may have occurred 2 to 4 weeks after the initial EC visit. For control subjects, the IDV was the visit found in the clinic log within 7 days of the corresponding EC visit. No follow-up visits are included as part of the IDV for the control subjects.

Taking into account all subjects—not just those for whom a pelvic examination was indicated because of having symptoms of an STI or needing a first or annual pelvic examination—control subjects were more likely than EC users to get a pelvic and Pap smear at the IDV or IDV follow-up. This may reflect the fact that for many EC users a pelvic examination was not indicated at the IDV. Control subjects may have been presenting with symptoms of STI or for renewal or change of a contraceptive method. EC subjects, in contrast, presented in a 3-day window after unprotected intercourse, which may have no relation to the presentation of STI symptoms or the timing of an annual Pap smear. Therefore, the group selection process itself may have created a significant difference between the two groups in acquisition of pelvic examination and Pap smear at the IDV. Requiring a pelvic examination at the time of prescribing EC may be a barrier to accessibility by increasing the cost of a visit.[12] If indicated, screening examinations should be encouraged for STI and PAP smear testing; however, in general patients should be allowed to return after a 14-day interval, when a urine pregnancy test can reliably detect EC failure.

We predicted that there would be no differences in STI occurrence by group. We were surprised to find that the control subjects were more likely to be diagnosed with chlamydia than the EC subjects when evaluating the 24-month follow-up period as a whole. These data support our hypothesis that EC use is not associated with a greater incidence of STI. The larger incidence of chlamydia in control subjects could possibly be explained by differences in condom use over time in the two groups. We could not effectively collect data regarding ongoing contraceptive use in our retrospective chart review. The number of STIs occurring in our population is too small to answer this question definitively, and more research is needed.

Limitations

As with any retrospective review, the single greatest limitation in our review was the variability of available data from chart to chart. This flaw is common to all retrospective chart reviews, because the data was collected for purposes other than research.[13] Not every data point was collected at the time of the clinic visit for every subject because there may have been no clinical need for it. This fact made comparing EC users and controls problematic. For example, many EC users had a special EC intake form in their charts, which provided consistent information that was often not available from control charts. For example, documentation of the number of current partners was available in 76 EC charts, but in only eight control charts. Each subject's data profile was a unique compilation of all points available for that subject. For some subjects, this represented nearly all desired data; for others this represented only a small fraction. Incomplete data presents difficulty in generalization.

Another limitation is that the subjects in our study may have received follow-up care at another site for pregnancy and STI and we did not have access to those records to review. In addition, the subjects who were lost to follow-up in our study may have slanted the data in favor of or against our conclusions. Larger study groups would better reveal the differences and similarities between EC users and controls, especially around the issue of loss to follow-up. Our mean period of follow-up was 10.8 months—less than half of the defined study period of 24 months. With a larger initial study group, a larger number of subjects would generate more follow-up visits from which to collect data. However, the number of subjects in our sample provided sufficient power to detect medium and large effect sizes in STIs and pregnancies between those patients who used EC and those who presented for other reproductive health care. A larger sample size would have been needed to detect smaller effects.

Lastly, our study was conducted in an urban, hospital-based clinic, and the results may not be comparable to other sites and other subject populations. Again, more research with different populations of EC users would aid in determining conclusions about the risks and benefits of using EC. More prospective research assessing the relationship between EC use and pregnancy and STI is needed.

Conclusions

Our data showed that EC use was not associated with an increased incidence of pregnancy or STIs and support our hypothesis that using EC is not associated with poorer reproductive health outcomes. Many barriers to EC use still remain, but our data suggest that the risk associated with EC use is much smaller than the benefits. Prescribing EC in advance should be considered, given the favorable risk-benefit ratio in this adolescent clinic population. For some young women, benefits may include expanded access to gynecologic care. Our data showed that EC use may be associated with obtaining the first pelvic examination and Pap smear among subjects who had never received these services. Obtaining EC may provide the opportunity for STI testing, cancer screening, and contraceptive counseling that could ultimately improve reproductive health outcomes for young women who request EC.

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