

Advanced provision of emergency contraception does not reduce abortion rates

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Abstract

A number of small studies have demonstrated increased use of emergency contraception (EC) when women have a supply available at home. It has been suggested that widespread use of EC could reduce abortion rates. We undertook a community intervention study designed to determine whether offering advanced supplies of EC to large numbers of women influenced abortion rates. All women aged between 16 and 29 years living in Lothian, Scotland, were offered, through health services, five courses of EC without cost to keep at home. Of a population of around 85,000 women in this age group, the study showed that an estimated 17,800 women took a supply of EC home and over 4500 of them gave at least one course to a friend. It was found that nearly half (45%) of women who had a supply used at least one course during the 28 months that the study lasted. In total, an estimated 8081 courses of EC were used. EC was used within 24 h after intercourse on 75% of occasions. Abortion rates in Lothian were compared with those from three other health board areas of Scotland. No effect on abortion rates was demonstrated with advanced provision of EC. The results of this study suggest that widespread distribution of advanced supplies of EC through health services may not be an effective way to reduce the incidence of unintended pregnancy in the UK. © 2004 Elsevier Inc. All rights reserved.

1. Introduction

Unintended pregnancy is common and abortion rates are rising worldwide. Emergency contraception (EC) may prevent up to 95% of unwanted pregnancies [1]. EC is increasingly regarded as a means to reduce abortion rates [2,3]. Considerable effort and funding are being spent making EC available in countries where it is not yet licensed [4], promoting it in countries where it is [5] and relaxing restrictions on its provision [6]. But would improving access to emergency contraception really prevent large numbers of pregnancies?

If EC was used whenever it was indicated, it has the theoretical potential [7] to reduce abortions in Scotland from around 12,000 to 4,000 each year. Although most women of reproductive age in Scotland know about EC [8,9], only 1.9% of Scottish women aged 16–44 years used

it during 2001 [10]. In a small study undertaken in Edinburgh [11], advanced provision of EC significantly increased its use. Encouraged by these findings, the Lothian Emergency Contraception Project (LECP) was undertaken to determine whether giving large numbers of women supplies of EC to keep at home would reduce abortion rates.

2. Materials and methods

2.1. Participants

The project took place in the county of Lothian in South East Scotland. Every resident in Scotland can register with a general practitioner (GP, family doctor) who provides primary healthcare, including contraception, free of charge. Contraceptive supplies are not subject to prescription charges. EC has been licensed in the United Kingdom since 1984.

All health providers in Lothian likely to prescribe EC

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were invited to participate. This included all ($n = 124$) general practices, 17 community family-planning (FP) clinics, the gynecological and genitourinary medicine (GUM) departments of the main hospital (The Royal Infirmary of Edinburgh) and Brook Scotland, a nongovernmental sexual health service for young people. Supplies of EC were also offered to new college students at “Fresher’s Fairs” at the start of the academic year in autumn 2000.

It was planned that all women aged 16–29 years who lived in Lothian were to be offered five courses of Schering PC4 (Schering Healthcare, England) to keep at home. PC4 consisted of four tablets of ethinylestradiol (EE) and levonorgestrel (LNG) ($50 \mu\text{g}$ EE and 0.25 mg LNG with two tablets taken 12 h apart within 72 h of intercourse). PC4 was the only EC product available in 1999 and had to be prescribed by a doctor. The five courses and a detailed information/instruction leaflet were packaged in one box. Women who were sterilized or using an intrauterine device or contraceptive implant were excluded from the study. The project was advertised widely with the intention that women themselves would ask for a supply of EC when attending for routine healthcare. Publicity materials—information leaflets and posters—were distributed to all general practice offices, participating clinics, libraries, cinemas, hairdressers, community pharmacies, nightclubs, pubs (bars) and discotheques, and posters were displayed in public toilets. A press conference for the local and national media launched the study. Every invitation for media publicity was accepted. Nine months after initiation of the study, every household in Lothian was mailed a postcard inviting women to ask their doctor for supplies of EC to keep at home.

2.2. Data collection

A record of the number of project supplies sent to each participating center was held centrally and centers kept a record of the number of women receiving a box of EC (five courses). These records revealed how many women received a supply of EC to keep at home.

A questionnaire was designed to determine, among a sample of women eligible to receive supplies, how many had been offered (and accepted) EC and whether and how they had used it. Ten of the participating general practices were selected randomly from three subgroups representing a range of socioeconomic characteristics and location. The questionnaire was mailed to all 6486 women aged 16–29 years registered with the 10 practices after the project had been running for 18 months. One reminder was sent to nonrespondents (one practice declined to send a reminder). Using a similar questionnaire, patterns of use of EC were also investigated among a random sample of 310 women who had received a home supply from an FP clinic.

As part of the evaluation, in-depth interviews were conducted with a sample of women who received project supplies of EC and with professional staff in case study practices. These data will be reported elsewhere. To determine

the effect of the intervention, annual abortion and birth rates [12] from 1998 to 2001 were compared between Lothian and three other large Scottish Health Board areas (Grapian, Tayside and Greater Glasgow) using routine data collected by the Information and Statistics Division (ISD) of the Scottish Health Service. Abortion referral rates during 1999, 2000 and 2001 from individual general practices in Lothian were compared using data from the centralized Lothian Abortion Referral Service [13]. Ethical approval for the study was obtained from the local research ethics committee.

2.3. Analysis

Total abortion rates in 1998/9 and 2000/1 between Lothian and other health boards were compared using multiple logistic regression. Referrals for abortion in 1999, 2000 and 2001 between groups of general practices in Lothian were compared using two-sample *t* tests using a logarithmic transformation to achieve approximate normality. Patterns of acceptance and use of EC were examined through frequencies of response from the two questionnaires.

Characteristics of those who received advanced supplies of EC were identified using questionnaire data from women registered at case study practices. The intra-class correlation coefficient estimated from a variance components model based on 2629 respondents, suggested that around 10% of the total variability in the outcome could be attributed to differences in population characteristics between the practices. A multilevel model was therefore constructed using MLwiN software (version 1.10.0006) to predict whether or not the respondent received advanced supplies of EC. The individual explanatory factors included in the model were: age (years); highest qualification (five-way categorical scheme: still at school, vocational qualifications, high school equivalent qualifications at age 17–19, degree/postgraduate and “other”); employment status (three-way categorical scheme: full-time paid employment, full-time student and all others); co-residency (binary: living alone or with unrelated others, all other states); housing tenure (three-way categorical scheme: privately owned, rented from public housing organizations and “other”); and past use of EC. Due to the effects of multiple incomplete entries the final model is based on data from 2294 (87.3%) respondents. Only associations significant at 0.01% are reported in this article.

3. Results

Ninety-seven general practices in Lothian and all the other services providing EC, participated in the study. Six months after initiation of the study it became evident that very few women requested advanced supplies of EC. Because they appeared enthusiastic about taking a supply home if actively offered, centers were asked to offer supplies rather than waiting for the women themselves to ask.

Table 1
Number (and percentage) of project packs distributed by participating services

| Service | No. (%) |
|-------------------------|-------------|
| Family-planning clinics | 6549 (36.7) |
| Brook Scotland | 924 (5.2) |
| Hospital clinics | 2025 (11.4) |
| General practices | 7708 (43.2) |
| “Freshers’ Fair” | 625 (3.5) |

Newsletters were sent regularly to centers to encourage recruitment.

3.1. Number of women receiving advanced supply of EC

The project ran from September 1, 1999 to December 31, 2001. During this time period a supply of EC had been distributed to 17,831 women (Table 1). There was a wide variation in the number of packets distributed by each general practice (Table 2).

From the general practice survey, 943 questionnaires were returned undelivered, 2817 women responded—a rate of 50.8%, 188 returned questionnaires were blank, leaving 2629 for analysis. Two-hundred and eighty-six women (92%) completed the FP clinic questionnaire. Three-hundred and sixty-one (13.7%) of respondents to the GP questionnaire reported receiving project packs of EC. Only age [odds ratio (OR): 0.94; 99% confidence interval (CI): 0.88–0.99] and use of EC prior to September 1999 (OR: 2.58; 99% CI: 1.83–3.62) were significantly associated with receipt of project EC ($p = 0.01$).

Of the women responding to the questionnaires, 116 (32.1%) of the GP practice sample and 60 (21%) of the FP sample reported giving away at least one packet of EC to another individual. Assuming that 26% (the mean of the two samples) of women receiving packets from the other project sources (Table 1) also gave supplies away, we estimate that about 4772 women received at least one course of EC from a friend. Thus, a total of at least 22,603 women had access to EC without needing to see a doctor.

Table 2
Number of general practices distributing specific numbers of project packs

| No. of packs distributed | No. of practices |
|--------------------------|------------------|
| <10 | 7 |
| 10–19 | 7 |
| 20–49 | 17 |
| 50–99 | 30 |
| 100–200 | 20 |
| >200 | 5 |
| No information provided | 7 |

Two practices hold two separate branch surgeries, which are counted individually in the list of 124 Lothian Practices but functioned as a single practice during the project. Thus, the total number of practices listed here is 93.

Table 3
Main method of contraception used by GP survey respondents and national sample

| Method | Case study practices respondents (%) | | National sample (%) ^a | | |
|-------------------------|--------------------------------------|-----------------------------|----------------------------------|-----------|-----------|
| | On receipt of project EC | On completing questionnaire | Age 15–19 | Age 20–24 | Age 24–29 |
| Oral contraceptive | 33.5 | 48.8 | 64.4 | 69.7 | 51.7 |
| Contraceptive injection | 0.6 | 4.1 | | | |
| Barrier methods | 54.1 | 30.0 | 26.6 | 21.1 | 20.4 |

^aFrom ref. [31].

3.2. Use of EC

It was revealed that 53.3% of women who received a project supply of EC from their GP were given one course at the time they presented because they requested EC, providing four courses to keep at home. Most women receiving supplies from an FP clinic were not attending for EC, however, those who were, received the home supply in addition to the treatment required.

Fifty percent of respondents to the GP survey who had received an advanced supply of EC, and 40% of women responding to the FP clinic survey used at least one course of the five supplied. Overall, it is estimated that at least 8081 courses of EC were used in this time period. It seems likely that most of the 4772 women who received EC from a friend were given it because they needed it. A total of over 12,000 courses of EC may, therefore, have been used in Lothian during the time of the study

Of 647 women completing the questionnaires and receiving EC to keep at home (361 from the GP survey and 286 from the FP clinic), 36 (5.5%) reported the occurrence of an unintended pregnancy. Only 8 of the 36 women reported using EC in an attempt to prevent the pregnancy.

Of the 647 women, 294 reported using at least one course of EC. Of these, 75.7% of courses were used within 24 h, and 51.8% less than 12 h, after unprotected intercourse. Respondents completing the GP practice questionnaire who had a home supply of EC were more likely to be using hormonal contraception (oral or injectable) at the time of completing the questionnaire, than at the time of receiving supplies (Table 3).

3.3. Effect on abortion and birth rates

No significant differences were observed in any health board area in the total abortion rates (per 1000 women aged 16–44) or the rates for women aged 16–29 (Table 4) when 1998 or 1999 were compared with 2000 or 2001. Using an interaction model, the multiple logistic regression gave a 95% confidence limit of –6% to +10% for the difference between Lothian and Grampian in the change in abortion

Table 4
Total number (and rates per 1000 women) of abortions among women aged 16–29 in Scotland as a whole and in the four major health board areas from 1998–2001

| | 1998 | 1999 | 2000 | 2001 |
|-----------------|-------------|-------------|-------------|-------------|
| Scotland | 8882 (18.9) | 8542 (18.5) | 8368 (18.5) | 8453 (18.7) |
| Lothian | 1915 (24.2) | 1913 (24.3) | 1769 (22.4) | 1849 (23.4) |
| Grampian | 1009 (21.4) | 936 (20.3) | 857 (19.3) | 848 (19.1) |
| Greater Glasgow | 1655 (17.4) | 1613 (17.3) | 1582 (17.1) | 1643 (17.8) |
| Tayside | 882 (26.6) | 791 (24.6) | 829 (26.7) | 750 (24.1) |

rates between 1998–1999 and 2000–2001. There were no significant differences in changes in birth rates between the various health boards over the same years (data not shown).

There were no significant differences in the mean number of women referred for termination of pregnancy during 1999–2001 between the 10 practices distributing the most packets of EC, the 10 practices distributing fewest packets and the 7 who did not participate in the project (Table 5).

4. Discussion

Offering advanced supplies of EC appears to have had no effect on abortion rates in Lothian. This study is the sixth, and by far the largest, to show that advanced provision of EC increases its use [11,14–17]. Moreover, this study, like one other [17], has demonstrated there was frequent early use of EC, which is believed to increase efficacy [18]. In the present study, over 75% of women who had used an advance supply of EC had used it within 24 h, in contrast to the average 38 h taken to access it through an FP clinic [19].

If at least 18,000 young women in Lothian had easy access to EC, were more likely to use it and to use it quickly, why was there no measurable effect on abortion rates? Abortion rates are influenced by many factors and fluctuate from year to year. An effect of a single event, even a major one like the third-generation “pill scare” of 1995, is hard to demonstrate convincingly [20]. Abortion is a relatively uncommon event in Scotland. Fewer than 2000 of the

85,000 women aged 16–29 in Lothian have an abortion each year. For this reason, and despite knowing that they are notoriously hard to do [21], we chose to initiate a community intervention study in order to distribute supplies of EC to large numbers of women. Almost one in four women in the target group took at least four courses of EC home. All women were young, sexually active and nearly 54% of those receiving EC supplies from their GP were using condoms. Many doses of EC were given to another woman. With an abortion rate of 24/1000 (Table 4), we would have expected there to be approximately 530 abortions among the women who had a supply of EC at home. The intervention appeared not to prevent even half of the abortions. Perhaps simply not enough women took a supply home. Although some GPs issued supplies to many of the women, many health professionals did not promote the project to women who were not consulting for EC. Women themselves reported finding it difficult to ask for EC proactively. Several other studies have drawn attention to health professionals [22,23] and women’s concern [24] about deregulation and repeated use of EC. Although most women were pleased to accept a supply of EC to keep at home when offered, very few actually asked for a supply, even in the FP clinic where notices were displayed prominently.

Were advanced supplies given to the right women? The LECP made EC available almost exclusively through health services and most often to women who had already consulted for EC or for other contraception. In so doing, it may not have reached women most at risk of unintended pregnancy—those using no contraception or using condoms inconsistently who do not access contraceptive services.

Perhaps, having a supply of EC so easily available encouraged women to take more risks with unprotected intercourse. As with our pilot study, however, women tended to move from less effective methods of contraception (mainly condoms) to more effective methods (hormonal) during the period of follow-up (Table 3). Moreover, we asked women in the questionnaire surveys whether they felt that they were less likely to fully comply with their contraceptive method and the vast majority said they were not. It seems unlikely then that pregnancies prevented by EC among women who used it were matched by pregnancies arising from increased risky sexual behavior.

Perhaps the most likely explanation for the failure to influence abortion rates lies in the observation that even when women did have EC at home, it was not always used when it might have prevented a pregnancy. Seventy-four percent of the 36 women who had advanced supplies and reported an unintended pregnancy did not use EC. Many women have a “low sense of vulnerability towards pregnancy” [25], even when they know that they have taken risk. In a number of studies in different countries among women having abortions [2,26,27], the failure to recognize a risk of pregnancy is the most common reason for nonuse of contraception including EC. Having a supply of EC to keep at home will not help women who do not recognize the risk of

Table 5
Total number of project supplies of EC issued and total number of women referred for abortion 1999–2001 among the 10 best performing (distributed supplies to the most women) and 10 worst performing (distributed supplies to the fewest women) general practices and seven practices that did not participate

| Practices | Total EC supplies | Total abortion referrals | | |
|-------------------|-------------------|--------------------------|------|------|
| | | 1999 | 2000 | 2001 |
| Best performance | 2880 | 292 | 219 | 298 |
| Worst performance | 239 | 70 | 63 | 66 |
| Nonparticipants | 0 | 90 | 93 | 107 |

The number of patients (and therefore women in the relevant age group) registered with a general practice remains constant year to year.

pregnancy, and therefore do not recognize the need to use EC.

Were we expecting too much of the intervention in this setting? Contraceptive prevalence is high in Scotland and abortion rates are relatively low. It has been estimated, however, that in the UK some 70% of pregnancies are preventable [27] (contraception not used or used incorrectly or inconsistently), so even though the absolute number of unintended pregnancies is relatively small, there is a great opportunity for EC use. It is possible that in other settings, where contraceptive prevalence is low, abortion rates high and women relatively naive about EC, advanced provision may reduce the public health cost of unintended pregnancy.

Finally, it is possible that EC may be less effective than we believe. Estimates of efficacy are unsubstantiated by randomized trials. Efficacy is based on rather unreliable data and a great many assumptions [28] and have been questioned both in the past [29] and more recently [30].

Whatever the shortcomings of this study, the fact remains that multiple courses of EC were made available to a large number of women in advance of need. More than 17,000 of them took it home and over 8000 (perhaps as many as 12,000 if those who obtained EC from a friend are included) used it, yet no impact on abortion rates was measurable. While advanced provision of EC probably prevents some pregnancies for some women some of the time, the strategy did not produce the public health breakthrough hoped for. The prospect of reducing abortion rates by widening access to EC through health services seems somewhat diminished by the findings of this study.

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