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Original Article

Emergency contraception: Are reproductive-aged women well informed?

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Abstract. Despite available effective contraception methods, unintended pregnancy remains a significant health issue. Emergency contraception (EC) is used to prevent pregnancy after an unprotected or inadequately protected sexual intercourse. The aim of this study was to evaluate knowledge and personal experience with EC among reproductive-aged women. A prospective survey among a sample of Portuguese women at reproductive age was performed. The survey was anonymous, voluntary and included questions regarding sociodemographic characteristics, obstetrical history, known emergency contraception methods, timing to use EC, personal experience and efficacy of available methods. After completing the survey, participants were offered written information about EC. A total of 92 women participated on the survey but 3 were excluded due to incorrect filling. Mean age was 30.52 years and most were single, multiparous and with no previous abortions. Awareness rate of EC was 95.5% but only 56.4% knew that it prevented pregnancy. Just 16.5% stated that both hormonal oral method and IUD were the available methods and 67% believed that it was effective within 1 day after unprotected sexual intercourse. EC was previously used by 29.4% and to 65.9% participants the hormonal oral method was considered the most effective. Over 90% said that EC does not protect against sexually transmitted infections. Despite the high rate of awareness of EC our population had some limitations concerning the purpose and different forms of EC as well as the proper time limit to use it. Educating reproductive-aged women and health care providers about EC is important.

Keywords: Emergency contraception, survey, pregnancy, awareness

Introduction

Despite available effective contraceptive methods the high number of unintended pregnancies worldwide is an important cause of women requesting an abortion or having an unwanted child. Reasons for unplanned pregnancy include failure to use contraception or its incorrect use (e.g. condom breakage or slippage, missed or late doses of hormonal contraceptives), unplanned consensual intercourse and rape [1-4].

Emergency contraception (EC) refers to any intervention used to prevent pregnancy after an unprotected or inadequately protect episode of sexual intercourse [1-8]. Although EC does not protect against sexually transmitted infections (STI) it offers reassurance for millions of women who rely on condoms for contraception in case of condom breakage or slippage [6, 7].

EC was first investigated in the 1960s and received approval by the U.S. Food and Drug Administration (FDA) in 1998 [1]. The first described method of EC was published in 1974 by Yuzpe and colleagues which contained combined estrogen-progestin oral contraceptive pill [9]. Since then different regimens were developed and are nowadays available: progestin-only contraceptives, anti-progestins (either mifepristone or ulipristal acetate) and the copper-releasing intrauterine device (IUD).

Combined estrogen-progestin regimen

This method consists of two doses of 100 μg ethinyl estradiol and 0.5 mg levonorgestrel (LNG) taken 12 hours apart. The first dose of the Yuzpe regimen should be taken within 72 hours of unprotected sexual intercourse (UPSI). Further data demonstrated efficacy of norgestrel and norethindrone as optional progestins in this regimen [2, 4, 5, 7, 9]. Several clinical studies have shown that combined estrogen-progestin pills can inhibit or delay ovulation. It is associated with a 75% reduction of the risk of pregnancy although this efficacy decreases with time [5-7]. Few side effects have been associated: nausea (50%) and vomiting (20%) are the most common ones [2-5, 7].

Progestin-only regimen

Levonorgestrel has been the only progestin studied for

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TABLE 1
SOCIODEMOGRAPHIC AND OBSTETRICAL CHARACTERISTICS

Characteristics	No. (%)	95% CI
Mean age (yrs)	30.52 ±7.95	28.8-32.2
Marital status		
Single	43 (48.3)	38.8-58.9
Married	29 (32.6)	22-40.9
Not married but in a relationship	10 (11.2)	5.6-17.3
Divorced	6 (6.7)	1.8-12.8
Parity		
Nuliparous	22 (24.7)	14.6-35.3
Primiparous	25 (28.1)	19.7-39.3
Multiparous	42 (47.2)	34.8-57.3
Previous abortion(s)		
No	64 (71.9)	64-82.5
Yes	25 (28.1)	17.5-36

CI, confidence interval.

usage in EC. Two treatment schedules have been approved: two 0.75 mg pills taken 12 hours apart and a single-dose of 1.5 mg LNG. The single dose regimen or the first dose should be taken as soon as possible up to 72 hours after UPSI. Efficacy is similar among both treatment schedules without significantly increasing adverse effects [2-7].

The mechanism of action is similar to the one described previously for the combined estrogen-progestin regimen. The closer to ovulation treatment is given the less likely the probability of success [8]. This method is associated with higher pregnancy reduction (about 85%) and with fewer adverse effects when compared to the Yuzpe regimen. Like the latter most data supports that its efficacy decreases with time. Some reports demonstrated a 50% and 70% lower incidence of nausea and vomiting, respectively [4, 5, 7].

Anti-progestin regimen

Two anti-progestins have been effective for EC: mifepristone and ulipristal acetate (UPA). In Portugal mifepristone is used for medical abortion and, although highly effective, it is not licensed for EC.

UPA, a selective progesterone receptor modulator, was approved by the FDA in 2010 for EC. It is used as a 30 mg single-dose and is indicated up to 120 hours (5 days) after UPSI [1, 3, 5, 8, 10]. To date it is the only oral form of EC approved for the 72-120 hour period after UPSI.

UPA's primary mechanism of action is thought to be inhibition or delay of ovulation. The reported pregnancy reduction rate is greater than 85% and maintains its efficacy throughout 120 hours making it the most effective method of oral EC [5]. The most common adverse effects are headaches, nausea and abdominal pain [8, 10].

Since UPA is in pregnancy category X [3], prior to its administration women should be informed of the risks if pregnancy occurs.

TABLE 2
KNOWLEDGE OF EMERGENCY CONTRACEPTION

Question	No. (%)	95% CI
Have you ever heard of EC?		
No	4 (4.5)	1.1-8.4
Yes	85 (95.5)	91.6-98.9
Which methods of EC do you know?		
Hormonal oral contraceptive pill	70 (82.3)	71.3-88.2
IUD	1 (1.2)	0-3.5
Both	14 (16.5)	9.4-24.5
Does EC prevent pregnancy?		
No	35 (41.2)	29.6-52.3
Yes	48 (56.4)	45.9-69.3
Unanswered	2 (2.4)	0-5.9
When should EC be used?		
After any sexual intercourse	7 (8.2)	1.8-15.8
After every unprotected sexual intercourse	74 (87.1)	76.5-95.3
Unanswered	4 (4.7)	1.2-9.9
Until when can EC be used?		
10 days after sexual intercourse	1 (1.2)	0-4.7
3-5 days after sexual intercourse	17 (20.0)	11.8-29.4
1 day after sexual intercourse	57 (67.0)	54.4-76.5
1 day before sexual intercourse	1 (1.2)	0-3.5
Don't know	9 (10.6)	3.7-17.6
Have you ever used EC?		
No	60 (70.6)	61.2-80
Yes	25 (29.4)	20-38.8
Which of EC methods is more efficient?		
Hormonal oral contraceptive pill	56 (65.9)	56.6-75.3
IUD	17 (20.0)	11.3-28.2
Unanswered	12 (14.1)	7.1-20.5
Does EC protect against STI?		
No	79 (92.9)	86-97.6
Yes	4 (4.7)	0-9.9
Unanswered	2 (2.4)	0-5.9

CI, confidence interval; IUD, intrauterine device; EC, emergency contraception; STI, sexually transmitted infections.

Copper-releasing intrauterine device (IUD)

The copper-releasing IUD can be safely used for EC up to 5 days after UPSI or within 5 days from the earliest estimated date of ovulation, reducing the risk of pregnancy by more than 99% [8, 11-14]. The copper-releasing IUD can be inserted up to the time of implantation to prevent pregnancy. However, most providers limit insertion to

within 5 days of intercourse rather than ovulation because it is frequently difficult to estimate the day of ovulation. Besides higher efficacy it also works as long-term contraception (up to 10 years).

Unlike oral forms of EC, the copper-releasing IUD requires a physical examination and a physician comfortable in its insertion. For women at risk of STI administration of prophylactic antibiotics at least to cover *Chlamydia trachomatis* should be considered [14]. Copper is toxic to the ovum and sperm and therefore this method is effective immediately after insertion and works primarily by inhibiting fertilization. If fertilization has occurred there is an anti-implantation effect [8].

There has not been established a single mechanism of action for EC since it depends on the day of the menstrual cycle on which UPSI occurs and EC is administered.[2] Pregnancy is the only contraindication for its use, however some methods may be preferred in specific cases. Although highly effective, available data demonstrates that women are still not using EC as often as needed. Lack of knowledge among women or their physicians, difficulty in acquiring EC, lack of perception of the risk of pregnancy, or feeling of shame and fear if others knew about it may contribute to the underutilization of this method.

Emergency contraception should be discussed with women previous of their need and it should also be reaffirmed that a regular method of contraception is always more effective as long as properly used.

The aim of our study was to evaluate knowledge and personal experience with emergency contraception among a sample of Portuguese women at childbearing age through a survey.

Materials and Methods

We conducted a prospective survey among women seeking care in Centro Hospitalar de Lisboa Central (Maternidade Dr. Alfredo da Costa), a tertiary maternity center in Portugal, during four months.

Subjects were included if they were in reproductive age (between 18 and 49 years of age) and were recruited from family planning, gynecology or unwanted first trimester pregnancy appointments and postpartum ward.

Participants were informed that the survey was anonymous and voluntary and that its purpose was for medical research. Verbal consent was obtained and women were not compensated for their participation. After completing the survey they were offered an informative handout addressing different topics of the survey.

The survey included 13 questions regarding sociodemographic characteristics, obstetrical history, knowledge of EC methods and timing to use it, personal experience and efficacy of available methods.

Women were asked about their age, marital status, parity and previous abortions. Next, they were questioned if they had ever heard about EC. If the answer was negative, the survey was complete; otherwise it would continue. The following items addressed methods of EC known ("hormonal oral contraceptive pill" and/or "IUD"), efficacy of EC in preventing pregnancy ("yes" or "no"), appropriate circumstance ("after any sexual intercourse" or "after every unprotected sexual intercourse") and proper time limit to use it ("10 days after the sexual intercourse", "3-5 days after the sexual intercourse" or "1 day after the sexual intercourse", "1 day before the sexual intercourse", "don't know"). Previous experience with this method of contraception was evaluated and participants were also asked about the person who counseled them in taking EC ("friend", "doctor", "nurse", "other", "no one"). The two last items regarded the most efficient method of EC ("hormonal oral contraceptive pill" or "IUD") and if it was effective in preventing STI ("yes" or "no").

Sociodemographic characteristics of the participants were described by standard descriptive statistics (using means and standard deviations (SD) for continuous variables) and proportions and 95% confidence intervals (CI) for categorical variables. The remaining items of the survey were determined by using proportions and 95% CI.

Results

A total of 92 women answered the survey but three were excluded due to incorrect filling. Consequently, 89 participants were included in the study.

The mean age of participants was 30 years and most were single (48.3%), multiparous (47.2%) and with no history of previous abortions (71.9%) (Table 1).

With respect to specific knowledge of EC (Table 2), 95.5% of women answered "yes" to the question "Have you ever heard of EC?" Therefore, the remaining of the survey was only completed by 85 women.

The majority of women (82.3%) knew about hormonal oral contraceptive pill as an EC method but only 14 (16.5%) stated that both the hormonal oral method and the copper-releasing IUD were in fact the available methods. When asked if EC was efficient in preventing pregnancy just over half of them (56.4%) said "yes." As for the appropriate circumstance to use it 87.1% answered "after every unprotected sexual intercourse". When addressed the proper time limit, through a multiple-choice question, only one fifth of participants knew that EC could be effective within 3-5 days of the unprotected sexual intercourse and about two thirds considered the 1-day after unprotected sexual intercourse option as the correct one.

Regarding previous personal experience with this method of contraception the majority of participants had never used it before. For those who had used it (25 women), a friend or their doctor were the ones who had counseled them the most (in 7 and 8 women, respectively).

As for the most efficient method of EC, the hormonal oral method was the one considered by most participants (65.9%) with only 20% considering the copper-releasing IUD as the choice.

The last question of the survey addressed knowledge of women on the efficacy of EC in protecting against STI and over 90% said "no."

Discussion

Forty years have passed since the first regimen of EC was established. Since then, new and more efficient methods have been developed presenting nowadays rates of 75-99% efficacy on pregnancy prevention.

Since 2007 abortion, by women's choice, is legal in Portugal until the 10th week of pregnancy. According to the yearly report on pregnancy termination in Portugal, during the year of 2013 there were 17964 pregnancy interruptions and of these 17414 were by women's choice [15]. The authors agree that aside from these numbers of pregnancy interruptions, what really matters is the number of women that would benefit from EC if they were aware of it and if they would consider it to be safe.

Awareness of EC has always been a key point in preventing its use. However in our study a significant number of women (85 in 89, representing 95%) were aware of EC. Previous studies have also evaluated this issue. Mollen et al. [16] in 2013 reported a 63.7% rate of awareness of EC among female adolescents, Abbott et al. [17] in 2004 reported a 77% rate of awareness in adult women and Chuang et al. [18] in 2005 reported an 85% rate of awareness of EC among adult women.

Despite a higher awareness rate, in our study, participants had significant limitations concerning knowledge of available methods of EC and their proper use. As for the correct timing to use EC about two-thirds of participants considered that it would only be effective 24 hours after UPSI. Most women still do not consider the copper-releasing IUD as a form of EC which is not only the most efficient method but also the only one that has the potential to offer long-term contraception.

Another misconception in our population concerned the purpose of EC. Just over half of participants knew that EC worked by preventing pregnancy but 92.9% knew that it does not protect against STI. Indeed, if women do not recognize the aim of EC they will not consider it after UPSI. The non-recognition of the risk of pregnancy (either because women are unaware of their ovulatory period or because they do not believe that a single missed pill would be enough), the cost or the difficulty in obtaining EC or the myths associated with EC (induces abortion, contains massive levels of hormones and is only used by irresponsible women) could also contribute to its underutilization.

Regarding previous personal experience with this method of contraception most participants claimed to have never used it before. Forty percent (10 cases) of the 25 women who had previously used EC were counseled either by their doctor or nurse. Although health care providers counseling is a positive feature the authors agree that this rate is far too low since every woman attending a gynecology or family planning appointment should be aware of this last option of contraception. Previous studies have indicated that women's health care providers do not routinely discuss EC with them [5]. Reasons like lack of knowledge in their use and efficacy have been appointed.

Surely this study has its limitations: the reduced sample could explain the higher rate of awareness of EC when compared to other studies merely by a casual association and the study population included only women who sought medical care and therefore more prone to have previously discussed it with a health care provider.

Despite the high rate of awareness of EC our study population had some limitations concerning the purpose and different forms of EC as well as the correct timing to use it. However, the authors believe that it is comforting to know that women are conscious that it does not offer protection against STI. The authors hope that the informative handout that was given to every participant will make a difference by providing accurate information on this matter.

EC remains forgotten by many health care providers either by lack of knowledge about this method of contraception or by fearing that women will give up their regular method of contraception. EC should be considered a topic to debate in every medical or nursing appointment and promoting publicity campaigns or other forms of divulgation is crucial.

EC is safe and effective to every woman and should not replace a regular method of contraception.

This study provides further information on knowledge and personal experience with EC stating that despite a high awareness rate most women believe that it is only effective up to one day after unprotected sexual intercourse. Counseling on EC should emphasize the correct time limit to use it.

Conflict of Interest

The authors declare that there is no conflict of interests regarding the publication of this article and no sources of funding.

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