

Emergency contraception

BACKGROUND Humans have long sought an effective method of contraception that could be utilised after unprotected sex.

OBJECTIVE This article aims to examine the range of available emergency contraceptive options, with particular emphasis on the advantages of progestogen only emergency contraception over the combined regimens advocated in the past.

DISCUSSION The recent release of the first commercially packaged emergency contraceptive regimen on the Australian market has refocused attention on this important public health issue. The widespread adoption of effective emergency contraceptive regimens has the potential to reduce the rate of unplanned pregnancy and termination of pregnancy in Australia. This article aims to discuss available regimens, their mode of action and existing barriers to use, and controversies such as over-the-counter supply of emergency contraception.

Emergency or postcoital contraception refers to contraception used after unprotected sexual intercourse has occurred. References to the use of both oral and vaginal postcoital preparations are found in many ancient manuscripts. In the first century AD the Greek herbalist Dioscorides and the Persian physician Avicenna both made reference to postcoital contraception in their writings. Unfortunately none of the methods they advocated were at all effective.

The precedent for modern hormonal contraception can be found in veterinary practice. Since the 1920s high dose injectable oestrogens have been utilised to prevent unintended pregnancies in breeding animals. In the 1960s this concept was extrapolated to humans and clinicians began to recommend the use of high dose oral or injected oestrogens as a means of preventing pregnancy following sexual assault. Despite the high incidence of severe nausea and vomiting, these regimens gradually began to be used more widely in women who had not used contraception but were anxious to avoid a resulting pregnancy.

The Yuzpe method

In 1977 the Canadian gynaecologist Albert Yuzpe, demonstrated that the use of multiple combined oral contraceptive pills provided effective postcoital contraception.¹ This method, which later came to bear his name, consisted of the equivalent of two

Nordiol contraceptive pills (ie. ethinyloestradiol 100 µg and levonorgestrel 500 µg) taken within 72 hours of unprotected sex, followed by an identical dose exactly 12 hours later. This method was widely used in many parts of the world and in some countries was marketed as a commercially packaged emergency contraceptive called PC4, although this has never been available in Australia.

The search for an alternative to the Yuzpe method

The Yuzpe method is not without troublesome side effects. Although nearly 50% of women using the method report no significant problems, 22% of users report mild to moderate nausea and a further 25% report both nausea and vomiting. Irregular vaginal bleeding following the use of the method is also common, due to the destabilising effect that progestogens have on the endometrium. There were also some theoretical concerns regarding the use of combined emergency contraception in women where the use of synthetic oestrogen was contraindicated. A more recent complication has been that in many parts of the world high dose pills such as Nordiol are being phased out of production. It is possible to use multiples of lower dose pills in order to achieve the appropriate dosage, but in practice this is less appealing. The manufacturers of Nordiol withdrew the product from the Australian market in February 2002.

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Figure 1. Multiple minipills vs. the prepackaged two pill regimen

Alternative methods of emergency contraception

It has long been known that the insertion of a copper intrauterine device (IUD) up to five days after unprotected sex provides very effective postcoital contraception, with a failure rate of less than 1%.³ The problem is that the use of an IUD is often contraindicated in women seeking emergency contraception because of their exposure to sexually transmitted infections (STIs) as a result of unprotected sex. Progestogen bearing IUDs have also been trialled, but have been found to be ineffective for postcoital contraception because their effect on the endometrium takes too long to occur to prevent implantation.

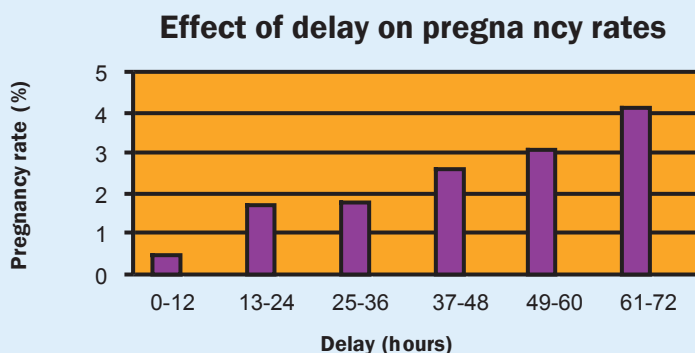
The antiprogestin mifepristone (RU486) has been used for emergency contraception and has also been found to be extremely effective for up to five days after unprotected sex, with very few side effects. It is unlikely that this drug will be marketed in Australia in the near future.

High dose progestogen emergency contraception

Initial trials suggested high dose progestogens might offer a promising alternative to combined emergency contraception and in 1996 a large prospective, randomised trial was commenced under the auspices of the World Health Organisation. This trial compared two doses of levonorgestrel 0.75 mg, separated by a 12 hour interval, with the established Yuzpe regimen.³ The progestogen only regimen was found to be more effective than the combined regimen, preventing 85% of expected pregnancies compared with 76% in the Yuzpe group. The researchers also found a significant reduction in side effects such as nausea, vomiting, dizziness and fatigue in the women using progestogen only emergency contraception. The incidence of vomiting in particular was reduced from 25% to 2.7%, making the use of routine anti-emetics unnecessary.

High dose levonorgestrel preparations have been available in Europe for many years but it was only in July 2002 that a commercially packaged emergency contraception regimen became available in Australia under the trade name of Postinor-2. Until the release of this preparation, practitioners wishing to prescribe progestogen only emergency contraception needed to make up the appropriate dose with multiple minipills, ie. 25 Microval or Microlut pills initially, followed by a further 25 pills 12 hours later. The need for such a large number of pills has represented a real barrier to the widespread adoption of progestogen only emergency contraception in Australia. The availability of the prepackaged two pill regimen makes it easier for practitioners to prescribe the correct dose and for women to use it. Figure 1 compares the multiple pill to the two pill regimen. Postinor-2 is presently available on private prescription at a cost of approximately \$19-25. Since it is not listed on the Pharmaceutical Benefits Scheme, there is no reduction in the price for those with concession cards. It is still however, possible for practitioners to continue to prescribe the multiple minipill regimen (which is available on the PBS) to those patients where cost may be an issue.

Table 1. Timing of emergency contraception with levonorgestrel or the Yuzpe regimen. Adapted from the findings of the Task Force on Postovulatory Methods of Fertility Regulation.³



How critical is timing?

The WHO trial also confirmed the intuitive, but previously unsupported view that the efficacy of emergency contraception is greater the earlier the first dose is taken following unprotected sex. With each 12 hour delay the researchers found there was a doubling of the risk of pregnancy (Table 1).

Interestingly though, a subsequent study⁴ has demonstrated that the Yuzpe regimen retains some

effectiveness up to 120 hours after unprotected sex and should therefore be considered even though the recommended 72 hour period has elapsed. There is no evidence as to whether the progestogen only method is effective for more than 72 hours. Another study⁵ has suggested the 12 hour time interval between doses may not be so critical as once thought for progestogen only emergency contraception, since serum progestogen levels remained relatively stable for up to 24 hours after the initial dose. Although not yet accepted clinical practice, this may mean that in the future, women will be instructed to take the first dose as soon as possible after unprotected sex and the second dose at the next convenient waking hour 12 or more hours later.

How does emergency contraception work?

The mechanism of action of emergency contraception probably varies depending on when in the cycle it is administered. A number of studies have suggested that when the regimen is used in the follicular phase of the cycle, the primary effect is to delay ovulation so that fertilisation does not occur.⁶ Progestogens are believed to have an effect on tubal motility and can also initiate changes in the endometrium, which might act to discourage implantation of the fertilised ovum. These two effects may be more important when the emergency contraceptive regimen is administered after ovulation.⁷ It is this potential to interfere with the implantation of a fertilised ovum that may provoke philosophical objections to the method in those who consider any disruption to the process of implantation as abortion. There is however, no evidence that any available hormonal emergency contraception regimen has the ability to disrupt an early pregnancy once implantation has occurred. Since progestogens in the dosages used in emergency contraception is not known to be teratogenic there would appear to be no evidence based rationale for the commonly cited recommendation that emergency contraception should be used only once per cycle.

Issues surrounding the use and prescribing of emergency contraception

Estimates from the United States indicate that approximately 60% of pregnancies are unintended at the time of conception, ie. they are either unwanted or mistimed. Approximately half of these pregnancies will end in termination.⁸ It is difficult to obtain accurate figures on the number of abortions performed in Australia but estimates suggest that almost

90 000 abortions are performed here each year.

In 1990 Duncan surveyed women attending a British termination clinic about their knowledge of emergency contraception.⁹ Thirty percent of those interviewed had never heard of emergency contraception and a further 10% did not know where or how to obtain it.

It is likely a similar level of knowledge exists in Australia and therefore emergency contraception remains an under utilised option in this country. There would appear to be significant potential to reduce the rate of both unplanned pregnancy and abortion if there was an increased awareness and appropriate use of emergency contraception.

It is important for the practitioner to remember that a request from a woman for emergency contraception may indicate that she is also at risk of contracting a STI from that sexual encounter. The woman should be given appropriate information about STIs and invited to return for testing if there are any concerns. There are also some cases where the history would indicate the need for referral for additional counselling and support. Some examples of situations where this may be required would be where emergency contraception is requested after a sexual assault, or when the history taken from the woman indicates issues around relationship problems, domestic violence, or drug or alcohol problems.

For women whose first language is not English, there may be special access problems, both in terms of possible cultural barriers to emergency contraception and in accessing appropriate information. Ideally, practitioners should make themselves aware of the services in their state that can assist with the delivery of services such as emergency contraception to those women who come from different cultural backgrounds.

Over-the-counter supply of emergency contraception

One option for improving access is to consider making emergency contraception available over-the-counter. This has already occurred in 80 countries throughout the world, where progestogen only emergency contraception is available through accredited pharmacies. Some studies indicate that easier availability may make the method more acceptable to younger women, who may be more reluctant to seek emergency contraception from their usual health provider for fear of being in some way 'judged'.¹⁰ In 1995 a study by Young in New Zealand found that 62% of those attending a termination clinic stated

they would have used emergency contraception if they had access to a supply at home and 57% said they would have used it had it been available from the pharmacist without a prescription.¹¹ The disadvantage of making emergency contraception available without prescription is that consultation with a health provider allows for full discussion of both the method and ongoing contraceptive options. As stated above it also presents an opportunity to arrange screening for STIs if appropriate. It may be possible however, to address some of these issues by means of a well designed package insert and it is certainly reassuring that the work of Anna Glasier has shown that the prospective supply of emergency contraception is not associated with any increase in at risk sexual behaviour.¹²

Religious and moral attitudes held by the practitioner will obviously affect whether a woman is given information on the availability of emergency contraception and whether it is prescribed to her. There are women who also hold similar ethical reservations regarding the use of this method and for whom it will never be an acceptable option. Such views must of course be respected. It is important however, that these views be informed by the available medical evidence, and should a practitioner continue to have ethical reservations regarding emergency contraception, they should consider the option of referring any patient requesting the method to a practitioner who holds an alternative view.

Conclusion

The Australian release of Postinor-2 in mid 2002 has refocused attention on emergency contraception as an important public health issue. It is an extremely safe and effective contraceptive option for those who have failed to use contraception or whose usual method of contraception has failed them. Women need to be made aware that this method is available to them and their health providers need to feel confident in recommending and prescribing it. It would seem preferable to reduce the chances of an unplanned pregnancy occurring in the first place rather than to deal with the more difficult decisions that must be made once a pregnancy test is positive.

Conflict of interest: none declared.

References

1. Yuzpe A A, Lancee W J. Ethinylloestrodial and dl-norgestrel as a potential contraceptive. *Fertil Steril* 1997; 28(9):932-936.
2. Glasier A. Emergency postcoital contraception. *N*

SUMMARY OF IMPORTANT POINTS

- Progestogen only emergency contraception has largely superseded the combined regimens used in the past.
- Emergency contraception is safe, extremely effective and has the potential to reduce the rate of unplanned pregnancy if used more widely.
- The primary mode of action of hormonal emergency contraception is to prevent fertilisation. It will not dislodge an established pregnancy.
- The earlier emergency contraception is commenced the more effective it will be.
- Despite manufacturer recommendations, emergency contraception can safely be used more than once in a cycle if required.
- Practitioner attitudes will still influence whether a woman accesses emergency contraception in Australia.

Engl J Med 1997; 337(15):1059-1054.

3. Task Force on Postovulatory Methods of Fertility Regulation. Randomised controlled trial of levonorgestrel versus the Yuzpe regimen of combined oral contraceptives for emergency contraception. *Lancet* 1998; 352:428-433.
4. Rodrigues I, Grou F, Joly J. Effectiveness of emergency contraceptive pills between 72 and 120 hours after unprotected sexual intercourse. *Am J Obstet Gynaecol* 2001; 184:531-537.
5. Tremblay D, Gainer E, Ulmann A. The pharmacokinetics of 750 micrograms levonorgestrel following administration of one single dose or two doses at 12 or 24 hour intervals. *Contraception* 2001; 64(6):327-331.
6. Ling W Y, Wrixon W, Zayid I, Acorn T, Popat R, Wilson E. Mode of action of dl-norgestrel and ethinylloestradiol combination in postcoital contraception. Effect of postovulatory administration on ovarian function and endometrium. *Fertil Steril* 1983; 39:292-297.
7. Swahn M L, Westlund P, Johannisson E, Bygdeman M. Effect of postcoital contraceptive methods on the endometrium and the menstrual cycle. *Acta Obstet Gynaecol Scand* 1996; 75:738-744.
8. Brown S S, Eisenberg L. The best intentions: Unintended pregnancy and the wellbeing of children and families. Washington DC: National Academy Press, 1995:1-10.
9. Duncan G, Harper C, Ashwell E, Mant D, Buchan H, Jones L. Termination of pregnancy: lessons for prevention. *Br J Fam Plann* 1990; 15:112-117.
10. Hadley A. Picking up the pieces. *Practice Nurse* 1995; (9):169-173.
11. Young L, McCowan L M E, Roberts H E, Farquhar C M. Emergency contraception: why women don't use it. *N Z Med J* 1995; 108:145-148.
12. Glasier A, Baird D. The effects of self administering emergency contraception. *N Engl J Med* 1998; 339:1-4.

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