Termination of pregnancy

A resource for health professionals

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The Royal Australian and New Zealand College of Obstetricians and Gynaecologists

'Excellence in women's health'

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Summary

Termination of pregnancy is estimated to be the outcome of around one in four pregnancies. Around one in three women will have an abortion in their lifetime.

Supportive non-judgmental counselling should assist decision-making prior to termination of pregnancy; clinical assessment should be undertaken with arrangements made for follow-up and ongoing contraception.

The most appropriate method of termination depends on:

- the stage of the pregnancy
- the woman's particular circumstances, medical history and preference
- the experience, practice and clinical judgement of the practitioner
- the local availability of resources and infrastructure.

Methods of termination of pregnancy

Suction curettage

General

- surgical method used up to about 14 or 15 weeks gestation
- the most common method in Australia and New Zealand
- requires local or general anaesthesia
- cervical priming may be used beforehand
- failure rate 2-3 in 1,000, higher prior to 7 weeks

Side effects

- mild pain and bleeding

Complications

- rates rise with gestation
- infection up to 10%, usually not serious; less with "screen and treat" policy or prophylactic antibiotics
- repeat curettage for bleeding or retained products of contraception around 1-2%
- cervical trauma <10 in 1,000
- uterine perforation 1-4 in 1,000
- haemorrhage requiring transfusion 0.5-2 in 1,000
- maternal mortality <1 in 100,000

Manual vacuum aspiration

General

- surgical method used in first trimester especially prior to 7 weeks
- no information about use in Australia or New Zealand
- lower failure rate than suction curettage for very early terminations
- similar side effects and complication rates to suction curettage

Dilation & evacuation (D&E)

General

- surgical method used after about 14 or 15 weeks gestation
- cervical priming mandatory
- failure rates not reported, extremely rare

Side effects

- mild pain and bleeding, more prolonged than at earlier gestations

Complications

- similar to suction curettage but most rates rise with gestation
- cervical trauma 8-22 in 1,000
- uterine perforation 2-4 in 1,000
- haemorrhage requiring transfusion 2-4 in 1,000

Medical abortion

General

- no information about use in Australia; a minority of abortions in New Zealand
- evidence supports mifepristone plus misoprostol as the preferred regimen for medical abortion
- mifepristone is available in New Zealand but not Australia
- misoprostol is not approved for use in termination of pregnancy, but is registered for other indications and therefore available 'off-label' in both countries
- there is good evidence that medical regimens can be used throughout the first and second trimesters of pregnancy
- optimal dosage regimens for different gestations are still being developed
- women are usually aware of the passage of products of conception, which is accompanied by some pain
- a minority of women will require surgical evacuation of the uterus to complete the termination (around 5% for mifepristone and misoprostol regimens up to about 9 weeks gestation; higher proportions for other combinations)
- the interval between prostaglandin administration and abortion varies according to the regimen used, but is usually within a few hours for the mifepristone and misoprostol combination: the interval is longer for prostaglandin alone or with methotrexate.

Side effects

- bleeding is more prolonged than with suction curettage
- prostaglandin side effects may include diarrhoea, nausea, vomiting, dizziness, warm flushes, chills, headache

Complications

- haemorrhage requiring transfusion does occur but is probably no more frequent than with suction curettage
- pelvic infection is reported, but may be less frequent than with suction curettage
- uterine rupture has been reported with second trimester procedures: the frequency is probably <1 in 1,000
- uterine perforation and cervical trauma will not occur in the absence of surgical evacuation of the uterus

Other methods

Previously used extra- and intra- amniotic instillation methods of inducing abortion have been replaced by the methods described above for safety reasons.

Choice of method

With medical abortion, around 95% of women can avoid a surgical procedure, but several visits are required and bleeding and pain tend to last longer.

Surgical abortion is quicker and awareness can be avoided using general anaesthesia.

The health outcomes appear to be similar, but many women have a strong preference for one or other approach.

Long term risks

Termination of pregnancy is possibly associated with increased risk of later miscarriage, preterm birth and placenta praevia. The evidence is strongest for preterm birth but overall is unclear and inconsistent: effects if confirmed are likely to be slight and similar to those following spontaneous miscarriage.

The evidence does not support an association between termination of pregnancy and infertility, ectopic pregnancy or breast cancer.

Psychological studies suggest:

- there is mainly improvement in psychological wellbeing in the short term after termination of pregnancy
- there are rarely immediate or lasting negative consequences
- there may be an association between termination of pregnancy and some adverse mental health markers: these may reflect pre-existing conditions.

The Royal College of Obstetricians and Gynaecologists has stated that "abortion is safer than continuing a pregnancy to term and that complications are uncommon".[1]

Introduction

Termination of pregnancy is a common procedure, estimated to be the outcome of around one in four pregnancies in Australia.[2-4] The large majority of terminations occur in the first trimester of pregnancy.[3,4] It is further estimated that around one third of all Australian women have at least one abortion.[2,5]

There is no national monitoring of pregnancy terminations in Australia, so accurate national data are not available.[6] Incomplete, indirect data have been derived from Health Insurance Commission statistics and public hospital data and, by extrapolation, from South Australia where monitoring does occur and which is assumed to be indicative of national practice.[7,8] More recently, monitoring has been established in Western Australia.[4] New Zealand's Abortion Supervisory Committee publishes an annual report including abortion statistics.[9]

This document provides an overview of the methods that may be used to terminate a pregnancy prior to 20 weeks gestation and the associated risks. It does not provide guidelines or recommendations on best practice. The aim is to provide a referenced, evidence-based resource for health professionals to assist in decision-making and provision of information in relation to uncomplicated requests for termination that might be encountered by a practitioner providing women's health care. It does not attempt to address exceptional or complex clinical needs: women in these circumstances need to consult a specialist practitioner. While the document discusses both medical and surgical methods, not all methods are available in all settings because of the differing expertise and infrastructure requirements involved, as well as availability of pharmacological agents.

The document is based on current evidence. The limited information on methods of termination of pregnancy in the Cochrane database has been referred to in the resource. The document has drawn on well-conducted recent reviews, including particularly those presented in the Royal College of Obstetricians and Gynaecologists (RCOG) Guideline.[1] The detailed guidance and recommendations for practice published by the World Health Organization (WHO)[10] and New Zealand's Abortion Supervisory Committee[11] were also consulted. No relevant guidance was found on the United Kingdom's National Institute for Health and Clinical Effectiveness (NICE) website.

Primary studies are referenced when found to be informative on issues discussed, including:

- large studies, often case series, which highlight areas of consistent, conflicting, variable or uncertain findings;
- recent studies reporting areas of developing knowledge and changing protocols;
- Australian and New Zealand studies where available, in order to reflect local conditions.

The reviews referred to provide a series of overviews of particular methods and aspects, with many referenced primary sources of potential use to readers interested in further exploring particular aspects.

The first section of the document provides general information about termination of pregnancy. The second section describes specific methods to terminate pregnancy and, for each method, the possible side-effects and associated risks. The third section summarises the evidence about long-term risks associated with termination of pregnancy.

The scope of the resource is limited: it does not include detail about the following important areas:

- epidemiology of abortion;
- health promotion and prevention of abortion;
- decision-making and counselling in relation to a decision about termination of pregnancy;
- reasons behind requests for pregnancy termination;
- legislation and legal aspects of abortion; or
- abortion after 20 weeks gestation.

Additional resources on some of these aspects are included at the end of the document.

General information about termination of pregnancy

Definition

'Termination of pregnancy', as used in this document, means deliberately ending a pregnancy so it does not progress to birth. The document focuses on termination of pregnancy prior to 20 weeks gestation and does not consider the issues or specific aspects of methods relevant after 20 weeks, although some included studies do report these. The vast majority of terminations are performed prior to 20 weeks gestation. The clinical circumstances after 20 weeks are diverse and complex, requiring specialist assessment, counselling and care.

Preparation for termination of pregnancy

Termination of pregnancy must be performed within the local legal framework: relevant law varies between Australian States and Territories and New Zealand. Practitioners need to be familiar with local conditions.

Not all women who consider termination of pregnancy will proceed to have a termination, and the process of decision-making needs to be supported by the health practitioner involved, with provision of accurate information and non-judgmental support and counselling.

Depending on the individual woman's clinical circumstances, needs and preferences, preparation for termination of pregnancy may then include:

- Confirmation of pregnancy and gestational assessment by clinical history and examination, pregnancy test and/or ultrasound examination:
  - to avoid an unnecessary procedure if a woman is not pregnant or miscarriage has already occurred;
  - to check for ectopic pregnancy; and
  - to ensure selection of most appropriate procedure.

  Some studies report routine ultrasound examination: although access to ultrasound is necessary it is not considered by the RCOG to be an essential prerequisite to abortion in all cases.[1] It may be necessary to assess gestation more precisely if medical abortion is to be offered.[12]
- General history and examination to assess medical risk.
- Blood group and Rhesus status
  - to identify Rhesus-negative women for administration of Anti-D, to prevent Rhesus immunisation and its sequelae in later pregnancies.
- Prophylactic antibiotics or testing for genital infection.
- Planning ongoing contraception following termination.

Consideration may be given to opportunistic and/or follow up health screening and advice, for example cervical cytology, rubella titre and smoking cessation advice.

A follow up appointment should be arranged and strongly encouraged, to include:

- assessment of physical recovery;
- discussion of ongoing contraception;
- consideration of emotional issues and arrangements for further review and counselling as necessary.

Methods of termination of pregnancy

A pregnancy may be terminated using a medical or a surgical approach, or a combination of the two. This section outlines the different methods, what a woman can expect to happen with each method, how well it works, and associated risks and side-effects.

Suction curettage is described first and in the most detail because it is the most frequently used method in Australia and New Zealand[3,4,8,9] and there is the most information about its use over the last two to three decades.

Surgical methods

Most of the information about surgical abortion and its complications is reported in case series and cohort studies, some of which are very large. A Cochrane review found insufficient data to make recommendations based on randomised trials about surgical methods for early termination of pregnancy.[13]

Surgical termination may involve the prior use of drugs or other techniques to soften and dilate the cervix.

Cervical priming

Cervical priming may be used prior to curettage depending on gestation and other clinical features[1] and is routinely used prior to dilatation and evacuation.

Methods of cervical priming are:

- osmotic dilators (laminaria tents or hydrophilic dilators) placed into the cervix, where they absorb moisture and expand gradually to dilate the cervix.[14] This process may take several hours to a day or more and is more commonly used in second trimester terminations. Complications of osmotic dilators, including retained fragments and infection, have been recently reviewed.[15]
- a pharmacological agent, usually a prostaglandin such as misoprostol or gemeprost; there is evidence that mifepristone can also be used for this purpose.[16-18]

Cervical preparation has been shown to increase baseline dilatation and reduce the force required to achieve adequate dilatation prior to curettage.[19,20] Randomised controlled trials suggest a reduction in intraoperative blood loss and surgeons subjectively assess the cervix as easier to dilate.[19-21] One large randomised study also found a significant reduction in duration of bleeding and in treatment for pelvic infection in prostaglandin pre-treated women, thought to be due to easier evacuation of the uterus after priming.[21]

Cervical trauma has been found in a large retrospective cohort study to be less frequent when the cervix is prepared before dilatation,[22,23] with some evidence that uterine perforation may also be less frequent after cervical priming.

Numerous studies confirm that vaginal misoprostol is an effective cervical priming agent and most of these studies suggest vaginal administration is more effective than oral administration, although dosage and timing differences limit certainty about this. Overall, recent studies suggest that in the first trimester a dose of 400μg is adequate, that it may be given around 3 hours prior to the procedure and that oral, sublingual or vaginal administration may be used, subject to local logistic and other considerations, including patient location and admission arrangements, and patient and staff preference.[1,24-26]

Because of the higher risk of cervical damage in younger women[23] and the greater risk of uterine perforation with increasing gestation especially in multiparous women,[22] the RCOG recommends routine use of cervical priming in women less than 18 years of age and after 10 weeks gestation.[1] The World Health Organization recommends routine use after 12 weeks gestation and from 9 weeks in nullipara and under 18 year-olds.[10] There is no evidence relating long term outcomes to the use of cervical priming.

The RCOG recommends 400μg misoprostol administered vaginally by the woman or a clinician 3 hours prior to first or second trimester surgical abortion.[1]

Suction curettage

Suction curettage is a minor surgical procedure which is the main method used in Australia and New Zealand for terminations in the first three months of pregnancy.[3,4,9]

The procedure

Cervical priming may or may not be used beforehand (see above).

Anaesthesia may be general or local, with or without oral or intravenous tranquilliser: the method will depend on availability at the particular clinic and the woman's choice.

The cervix is dilated using metal dilators to accommodate the selected suction curette, curettage is performed by applying controlled electrically powered suction to the curette and the uterine cavity may then be checked with tissue forceps and/or metal curettes.[16,27] Sharp curettage should not be used.[1]

Oxytocic agents may be given intravenously to stimulate the uterus to contract and have been shown in small studies to reduce immediate blood loss,[28,29] although the effect on potentially life-threatening haemorrhage has not been assessed. RCOG makes no recommendation and WHO recommends against routine use of oxytocic agents with suction curettage.[10]

Some authors report use of ultrasound to check completeness of the procedure either routinely or in selected cases.[16,30] RCOG does not support routine use.[1]

The products of conception may be examined by the surgeon;[16,30] the possibility of ectopic pregnancy or hydatidiform mole may be recognised at this time. RCOG considers routine histopathology to be unnecessary.[1]

Effectiveness and failure

The procedure is highly effective, but failure does occur. One large US study (over 33,000 procedures) reported continuing pregnancy rates of around 2.3 in 1,000 women, with higher risk in women with one or more prior pregnancies, and terminations at earlier than 7 weeks, particularly when small cannulae were used.[31] A more recent but smaller UK study reported similar ongoing pregnancy rates around 2.4 in 1,000.[32]

Another study, reporting somewhat lower overall failure rates, found that the risk was reduced significantly if the products of conception were routinely examined at the time of the procedure.[33]

The Kaunitz study calculated failure to terminate the pregnancy to be three times more likely using suction curettage before 7 weeks gestation, compared to 7 to 12 weeks gestation.[31] Paul *et al*'s study of 1132 women who had abortions prior to 7 weeks gestation[30] showed failure rates between 15 and 23 in 1,000. Over half of these procedures were manual vacuum aspirations, with around 40% having suction curettage. There was some indication that failure rates were higher in multigravidae. It is generally believed that failed termination of pregnancy will be more common where there is a uterine abnormality, but it may be that both are too rare for any association to be established.

Side effects

There may be some **pain** following a termination and some women require analgesia: oral analgesia is usually adequate and prophylactic analgesia is not indicated.[1]

Bleeding is to be expected following the procedure. Duration of bleeding is seldom reported but some estimates are included in reports of comparative studies with medical abortion. Mean bleeding days after suction curettage are reported as 5.4 and 11.[21,34,35] with similar durations, up to 18 days including spotting, following manual vacuum aspiration procedures.[36,37] Serious blood loss or haemorrhage is rare (see complications).

Other side-effects, such as nausea, are likely to be related to prostaglandins if used in cervical priming and anaesthetic drugs.

Risks and complications

Serious complications are rare, with mortality and serious morbidity occurring less commonly than in pregnancy continued to term.[1]

Mortality

In Australia three maternal deaths were reported in association with termination of pregnancy in the 1994-96 triennium[38] and none in the preceding nor subsequent triennia,[39,40] suggesting a maternal mortality rate less than 1 in 100,000. There were no recorded maternal deaths associated with 244,149 abortions in New Zealand from 1980-2001.[41] Grimes reported mortality associated with first trimester abortions in the US in the seventies as 1.6 in 100,000, increasing with gestation.[42] US data report falling mortality rates from 4.1 in 100,000

in 1972 to 0.4 in 100,000 by 1987.[43] Mortality increased with gestation and by the end of the period the commonest cause was anaesthesia related, the other main causes of death being infection, haemorrhage and embolism. US rates were 0.3-0.8 in 100,000 during the 1990s.[44]

Complications

Hakim-Elahi reported a very low total overall complication rate of 9 in 1,000 in 170,000 first trimester terminations performed in New York City during the 1970s and 80s, with hospital admission being required for 0.71 in 1,000.[45] The complications included haemorrhage, suspected perforation, ectopic pregnancy, sepsis and incomplete abortion. Other large American series from the 1970s report serious complications at around this rate for example 7 in 1,000 for low risk women[42] and 4 in 1,000 for women not having concurrent sterilisation,[46] these series including second trimester terminations. A Canadian retrospective cohort study of over 80,000 procedures, of which 10-12% were second trimester terminations, reported that overall only 7 in 1,000 of women experienced immediate complications, with reported complications including haemorrhage (>500ml), cervical laceration, uterine perforation, retained products, infection and maternal death.[47]

An Australian series found total complication rates including re-admissions of 14 in 1,000 up to 8 weeks gestation and 17 in 1,000 from 9-12 weeks in 11,000 procedures in the early 1980s.[48] Another Australian series focused on uterine perforation reported a major complication rate of 12 in 1,000 in the first trimester among 12,000 procedures.[49]

A recent Danish study of over 50,000 procedures recorded in the Induced Abortion Registry reported a complication rate of 34 in 1,000 within two weeks of the procedure for vacuum aspiration, with most being bleeding, re-evacuation or infection, although this study excluded women without a subsequent pregnancy.[50]

Within these low overall rates, the risk rises with operator inexperience and with gestational age, which also influences the method chosen.[1,22,23,32,42, 46,47,50]

Large studies estimate **uterine perforation to occur in 1-4 in 1,000 cases**, with lower rates in earlier pregnancies and procedures performed by experienced clinicians.[1,42,45,49-52] Some studies show an increase with increasing gestation, especially in multiparae.[22] An Australian retrospective study of nearly 14,000 women undergoing termination of pregnancy found a perforation rate of 0.5 in 1,000 in the first trimester (6 in 12,040 women).[49]

Laparoscopy or laparotomy may be required to assess and/or repair damage.

There is some evidence from concurrent laparoscopy studies that unrecognised perforations occur, although the majority of these do not require treatment.[53]

The rate of **cervical trauma is estimated at no greater than 1%**.1 It was substantially lower, 1 in 1,000, in the recent Danish Registry study[50] and reported even less frequently in the series of Hakim-Elahi *et al.*[45] It increases with increasing gestation and is higher in younger women and with inexperienced operators.[22,23] Suturing may be required.

Most authors note the inconsistency of definition and reporting of haemorrhage,

with transfusion rates providing what is probably the most useful index of clinically important blood loss. **Haemorrhage complicates around 1 in 1,000 abortions overall**, with lower rates for early abortions (0.88 in 1,000 <13 weeks), although the degree of blood loss is not defined in these UK data. Rates of blood loss requiring transfusion are unknown, but estimated to occur in around 0.5 in 1,000 (including later terminations and methods other than suction curettage),1 0.6 in 1,000[42] or 2 in 1,000[46] procedures. Zhou reported heavy bleeding in 4.4 in 1,000 and bleeding requiring curettage in 10.1 in 1,000, the latter including curettage for retained products of conception.[50] These rates include first and second trimester terminations.

Symptomatic infection following the procedure may occur in up to 10% of untreated women but is usually not serious.[1] Others have reported lower rates for example around 5 in 1,000[30,45] and 12 in 1,000.[50] Definitions and ascertainment tend to be inconsistent, but Grimes reported fever (>38C) after 7.5 in 1,000 suction curettage operations.[42]

More serious infections may be related to unrecognised chlamydial infection or bacterial vaginosis. Wein *et al* reported 5% positive Chlamydia rates in an Australian series of women presenting for pregnancy termination.[54]

Antibiotic prophylaxis[55] and/or screening for pre-existing infections and treating women with positive results decrease post abortion infection rates.[1] Sawaya's meta-analysis[55] found a relative risk of postabortal infection of 0.58 (95% confidence intervals 0.47-0.71) following antibiotic prophylaxis compared to placebo. Infection rates in these studies ranged from 1-11% in the treated and 5-23% in the placebo groups. In the short term, infection may cause pain and discharge and necessitate antibiotic treatment and, occasionally, hospital admission. In the longer term, the risk is tubal damage, pain and infertility, although studies have not confirmed an association between prior abortion and secondary infertility.[1] Penney *et al* found prophylaxis to be more cost-efficient than a screen and treat approach, with similar effectiveness in prevention of short-term infective morbidity.[56]

In addition to treating women prior to the procedure, screening does allow for notification and treatment of partners if infection is identified, which has benefits in prevention of reinfection and infection of others by an untreated partner.

Retained products of conception occur following fewer than 1% of procedures in some large cohorts[42,45,52] with higher rates associated with greater gestation and inexperienced operators.[32] The latter study reported an unusually high overall rate of incomplete terminations (requiring a further procedure) of 5.4%, while Zhou's series reported re-evacuation rates for bleeding and/or retained products of conception around 1.5%.[50]

Retained products usually present with increased pain and/or bleeding which should be assessed clinically, with or without ultrasound examination. Management options include conservative management, medical intervention (prostaglandins) or surgical evacuation of the uterus.

Ectopic, heterotopic and hydatidiform mole pregnancy are rare, but

failure to diagnose them can be serious. Clinical assessment before abortion should take these possibilities into account, assessment of the products of conception at surgery will provide a further clue and they should be considered in the differential diagnosis of abnormal pain and bleeding after abortion.

Anaesthesia

Abortion may be performed under local or general anaesthesia. Most women experience some pain when local anaesthetic is used,[57] but this is usually well-tolerated.[58] There is less pain with general anaesthesia and some women prefer each method.[59] Techniques of local anaesthesia are described by Keder[27] and addressed by RCOG.[1]

Complications related to anaesthesia

RCOG[1] and WHO[10] state that abortion is safer under local than general anaesthesia: these safety conclusions are based largely on retrospective case series and comparisons, with one small randomised trial comparing intravenous analgesia and general anaesthesia for incomplete miscarriage,[60] which is of uncertain relevance to elective surgical abortion. RCOG notes that women and clinicians may be unfamiliar with local anaesthesia and that some women prefer general anaesthesia. In some circumstances it may be preferable from the provider's perspective. Complication rates are very low with both approaches.

A 1977 randomised study of over 4,000 women in Ljubljana and Singapore found no differences in complication rates between women having local and general anaesthesia for first trimester abortion, although the aspirate volume was significantly greater in the general groups.[61]

Among the retrospective studies, some suggest no difference between complication rates when local and general anaesthesia are compared[45] while others report differences. The infrequency of serious complications and lack of information as to reasons for selecting anaesthetic technique limits the conclusiveness of most reports.

Grimes reported a large series with similar rates of major complications in women having local and general anaesthesia.[62] Both were considered safe overall, but there was a different spectrum of complications in the two groups. Fever and convulsions were more common in the local anaesthesia group, with haemorrhage, uterine perforation, cervical injury and abdominal surgery more common in the general anaesthesia group. Mackay retrospectively reported over 4,000 second trimester procedures under general anaesthesia and 5,000 second trimester procedures with local anaesthesia.[63] They again found convulsions more common in the local anaesthesia group, no difference in cervical injury or perforation rates, but a higher risk of serious complications in the general anaesthesia group, including persistent fever, blood transfusion and abdominal surgery. Osborn *et al* found an increase in haemorrhage and in overall complication rate among women who had general anaesthesia for suction curettage.[64] In 1981, Peterson *et al* reported a higher risk of death for abortion performed under general than local anaesthesia, with both rates <1 in 100,000 after adjustment for pre-existing disease and concurrent sterilisation.[65]

Anaesthetic complications are uncommon but laryngeal spasm, aspiration pneumonia, anaphylactic shock, malignant hyperthermia, cardiac arrhythmias, thrombophlebitis and bruising at the intravenous access site may occur. Risks are increased in the presence of obesity, smoking, diabetes and other chronic illnesses. Given that suction curettage generally takes less than 15 minutes the risk of anaesthetic complications can be expected to be lower than for more complex procedures.

Manual vacuum aspiration

Manual vacuum aspiration is a technique in which there is renewed interest in the USA and UK, particularly for surgical abortion prior to 7 weeks gestation.[16]

Uterine evacuation is achieved using a narrow cannula attached to a manual vacuum syringe, rather than the thicker cannulae and electric vacuum suction used in conventional suction curettage. In Paul *et al*'s study of 1132 women undergoing abortion at less than seven weeks gestation at a range of sites,[30] manual aspiration had a lower rate of failed abortion (1.1%) than electric suction (2.9%), while a larger study of procedures at less than six weeks gestation in women accepting early follow up had a failure rate of only 0.13%.[66] Results from two randomised trials comparing manual and electric vacuum aspiration suggest that the manual procedure is as acceptable to both patients and providers as the electric one, although it generally takes slightly longer.[58,67] A larger retrospective study suggests no differences in complication rates.[68]

Dilatation and evacuation (D&E)

D&E is used for terminations at more advanced gestation, usually after about 14 to 15 weeks, and this requires the cervix to be dilated more widely than for suction curettage.

The procedure

All studies report the use of some form of cervical priming prior to dilatation and evacuation at gestations of 14 weeks onwards and both WHO and RCOG recommend routine use of cervical priming at these gestations.[1,10]

Local or general anaesthesia may be used. The cervix may be dilated manually (using dilators) if necessary. Products of conception are then removed, usually piecemeal, using forceps. Sometimes the fetus will be passed intact if sufficient cervical dilatation has occurred.

Oxytocic agents may be given (see suction curettage).

RCOG considers "D&E can be undertaken safely only by gynaecologists who have been trained in the technique, have the necessary instruments and have a caseload sufficient to maintain their skills".[1]

Effectiveness

D&E will always terminate a pregnancy unless factors such as anatomical abnormality or anaesthetic complication prevent the procedure from being completed.

Side effects

These are similar to those described for suction curettage, although duration and amount of bleeding are thought to increase with increasing gestation.

Risks and complications

Risks associated with D&E are similar to those described for suction curettage (see above) although the rates may differ.

RCOG concludes that cervical injury is more common with second trimester D&E than earlier abortion and reports haemorrhage requiring transfusion in just under 4 in 1,000 cases after 20 weeks, compared with 0.88 in 1,000 prior to 13 weeks.[1]

Pridmore and Chambers' Australian study found perforation rates of 0.5 in 1,000 in 12,040 first trimester terminations and 3.2 in 1,000 from 13-20 weeks gestation (1,827 cases).[49] Eleven of 12 women with uterine perforations had had previous gynaecological surgery (mainly previous termination of pregnancy but also lower segment caesarean section and the large loop excision of transformation zone of the cervix procedure).

The Peterson *et al* series of over 11,000 D&Es[69] reported 9 in 1,000 bleeding over 500ml, with 4 in 1,000 requiring surgical treatment and 2/1000 being transfused. The cervical laceration rate was 8 in 1,000, higher after 18 weeks gestation. Febrile morbidity occurred with similar frequency, although few infections were considered serious. They did appear to increase in frequency with advancing gestation to 16 in 1,000 at 20-21 weeks. Perforation occurred in 4 in 1,000, but was later reduced following increased use of cervical priming.

Several studies report increasing complication rates with increasing gestation, although in the older series fewer second trimester procedures were D&Es.[42,46,47]

In contrast, one retrospective study from Canada suggests that D&E can be as safe between 15 and 20 weeks as suction curettage is before 15 weeks.[70] This applied for all complications, including more serious ones (which were rare for both methods). The rate for all complications (including infections and incomplete abortion) was 29 in 1,000 for women undergoing D&E, compared with 51 in 1,000 for suction curettage. There were two incomplete abortions, one uterine perforation, one haemorrhage requiring transfusion and one case of disseminated intravascular coagulation among 447 D&E cases (15-20 weeks gestation) for which follow-up was available.

Medical methods

A medical termination of pregnancy is one where drugs are used to induce abortion. Drugs used include prostaglandins, methotrexate and mifepristone, alone or in combination. Mifepristone is available in New Zealand but not Australia.[41,71,72] Misoprostol (a frequently used prostaglandin) and methotrexate are registered for other purposes in both Australia and New Zealand and therefore available for use 'off-label', subject to appropriate informed consent.

The drugs must be given, often in doses separated by two or more days, and the woman must then wait between a few hours and several days for abortion to occur when she will experience pain and bleeding. Other side effects are those of the drugs used. Specific contraindications to the drugs should be considered in planning medical termination and follow up is essential to ensure completeness of the procedure.

Published guidelines[1,10,11] recommend the establishment of protocols which include:

- the provision of clear information to women about what to expect, the necessary follow up, how to recognise complications, and access to urgent care;
- provision of 24 hour telephone advice;
- arrangements for uterine evacuation when needed;
- arrangements for emergency care if required; and
- arrangements for ensuring appropriate follow-up.

Mifepristone with prostaglandin in the first trimester

Mifepristone is a synthetic anti-progesterone. It has been shown to be an effective abortifacient when combined with a prostaglandin administered 2 days later. It works by decreasing progesterone action, thus increasing decidual prostaglandin production, increasing myometrial sensitivity to prostaglandins and softening the cervix.[73] Prostaglandins stimulate uterine contractions and also soften the cervix.

Although early work with mifepristone and prostaglandin regimens focused on gestations initially up to 7 weeks and then up to 9 weeks, there is now good evidence that this combination may be used to induce abortion throughout the first and second trimesters.[1,74]

The method

The most common regimens involve a single dose of mifepristone orally followed 48 hours later by a prostaglandin, usually misoprostol, given orally or vaginally and repeated doses of prostaglandin at intervals of around 4 hours if required. Up to 50% will have some bleeding and a few women (around 3%) will miscarry with mifepristone before the prostaglandin is administered. The majority will begin to bleed and pass products of conception within a few hours of prostaglandin administration. What is passed is checked for tissue, by staff if this occurs in a treatment facility, or by the woman if it occurs after discharge. The experience for the woman may be much like a spontaneous miscarriage, with some pain and bleeding to be expected.[11,74-76]

Follow-up is important to check for completeness of abortion and the need for curettage, especially if no tissue is seen during the woman's admission. A proportion of women, usually around 5% or less, will require surgical evacuation of the uterus for incomplete abortion or continuing pregnancy (see effectiveness and failure below).

Regimens

RCOG considers 200mg mifepristone orally followed 1-3 days later by 800μg misoprostol vaginally to be the optimal method of early medical abortion up to 9 weeks gestation, based on considerations of efficacy, adverse-effect profile and cost.[1] Reportedly effective regimens for later medical termination involve up to 4 further doses of misoprostol at 3-6 hourly intervals.[1,35,77]

200mg mifepristone in combination with prostaglandins has been shown to be as effective as 600mg.[78,79] Fifty milligram doses are less effective,[80] but 100mg may be adequate.[81] This finding remains to be confirmed.

RCOG reviewed the data relating to choice of prostaglandin and concluded that "misoprostol…is a cost-effective alternative for all abortion procedures for which…gemeprost is conventionally used".[1]

Misoprostol is more effective and better tolerated vaginally than orally, with fewer gastrointestinal side effects, although some women may prefer oral administration. Sublingual administration has also been reported and in some programs misoprostol is self-administered. Toxic doses have not been determined.[74,75,79,82,83]

Effectiveness and failure

Mifepristone in combination with vaginal misoprostol as described by RCOG has been reported to be consistently effective in inducing complete abortion in over 95% of pregnancies up to 63 days gestation. Complete abortion rates of 94% have also been achieved in large case series at 9-13 weeks gestation.[1,77,84]

Surgical intervention is undertaken in the remaining 5% or less for continuing viable pregnancy (a minority of cases) or more commonly incomplete or missed abortion. The frequency of surgical evacuation of the uterus is reported to decrease with increasing experience of the clinical team with the method.[74,85]

A large study found that continuing pregnancy was significantly more likely where gestation was 7 to 9 weeks than at lower gestations and primigravid women were more likely to have a complete abortion than those with previous pregnancies.[86]

Side effects

Pain and bleeding are to be expected, with cramping reported in around 90%, adequately managed with oral analgesia for most women. Mean and median days of bleeding are around 9-15, with ranges up to around 70 days. Other side effects may include diarrhoea (around 10-30%), vomiting (around 10-45%) and nausea (around 40-70%). Dizziness, headache, chills, shivering and fever are also reported. Side effects are dose-dependent and greater with oral and sublingual than with vaginal misoprostol. Most women seem to find the side effects acceptable.[75,83,87-89]

Risks and complications

Serious complications are rare, but mortality has been reported, including 3 fatal cases of toxic shock syndrome associated with clostridium sordelli.[90] Haemorrhage requiring blood transfusion is reported, with overall rates probably around 1-2 in 1,000.[83,85,89] Presumed pelvic or genital tract infection occurred in 2.7% of women in the Scottish series of over 4,000 women treated with mifespristone and misoprostol[86] and infection has been reported in other series.[91] A review found an overall rate of infection following medical abortion (up to 26 weeks gestation) of 0.92% among over 46,000 cases.[92]

There have been a small number of reports of congenital defects in the infants of women who have taken misoprostol during the first trimester in an unsuccessful attempt to induce abortion and proceeded to birth. These include Mobius' syndrome (facial paralysis), and limb and other defects. A case-control study cautiously suggests a teratogenic effect of vascular disruption type.[93]

As with other methods of termination, the possibility of ectopic, heterotopic or hydatidiform molar pregnancy should be taken into account when considering abnormal pain and/or bleeding before or after medical termination.

Prostaglandin alone in the first trimester

Synthetic prostaglandin E1 analogues, such as misoprostol and gemeprost, stimulate uterine contractions and also soften the cervix.

RCOG considers that "single agent regimens do not have a place in UK practice, where mifepristone is readily available".[1]

There is limited new evidence about single agent regimens for early medical abortion from areas where mifepristone has become available, including UK and USA. The following summary is derived from several review articles, including a Cochrane review.[79,82,83,85]

The method

Apart from the different dosage regimens, the method is similar to that described above for mifepristone and prostaglandin, but a higher proportion of women will require surgical evacuation of the uterus.

There is a variable time interval to abortion: it most commonly occurs within about 12 to 48 hours, but may take several days.

Regimens

There is no clear optimal regimen for termination of pregnancy with prostaglandin alone, although an American group has recently published a "consensus regimen".[94]

Most studies report the use of vaginal misoprostol, but other prostaglandins have been used and a variety of dosage regimens have been reported, including oral and vaginal administration.

Effectiveness and failure

Prostaglandins used alone have been found to be less effective than other medical regimens in the first trimester.

Side effects

Side effects are similar to those for mifepristone and prostaglandins.

Misoprostol itself is likely to have more side effects when used as a sole agent than in combined regimens because most of its side effects are dose-dependent and higher doses are likely to be required.

Risks and complications

These can be expected to be similar to those for mifepristone and prostaglandin regimens.

Methotrexate with prostaglandin in the first trimester

Methotrexate is a folic acid antagonist registered for use in cancer treatment, and it is used 'off-label' for a range of obstetric and gynaecological indications, including treatment of ectopic pregnancy in order to avoid surgery and minimise damage to the Fallopian tube. Its use in termination of pregnancy relies on its ability to inhibit trophoblast growth and consequently progesterone levels, resulting in prostaglandin release and increase in uterine contractions.

For pregnancy termination it is generally used in conjunction with a prostaglandin E1 analogue, such as misoprostol.

RCOG considers "methotrexate regimens may have a place in those countries where mifepristone is unavailable".[1] The summary below is derived from several review articles including a Cochrane review.[79,82,83,85,95]

The method

Apart from the different dosage regimens, the method is similar to that described above for mifepristone and prostaglandin, but a higher proportion of women will require surgical evacuation of the uterus.

Regimens

Studies report the administration of methotrexate used intramuscularly or orally followed by misoprostol up to 7 days later.

Effectiveness and failure

Around 60 percent of women are reported to abort within 24 hours of the first misoprostol dose, but it may take 3-4 weeks to reach cumulative abortion rates close to 90%.

One randomised controlled trial was found comparing mifepristone and prostaglandin with methotrexate and prostaglandin: the overall success rates were comparable, but the mean time to expulsion was much longer with methotrexate.[96]

Diminishing rates of complete abortion are reported beyond 7 weeks gestation.

Side effects

Pain and bleeding patterns are similar to those described for prostaglandins.

Other side-effects are also similar to those of other medical abortion regimens.

Risks and complications

In general these are similar to those described for prostaglandins although serious complications have been reported following use of methotrexate in treatment of ectopic pregnancy.

Methotrexate is a teratogen in high doses. There are case reports of fetal anomalies after failed medical abortion with methotrexate and misoprostol, although most women exposed to these agents are said to have normal outcomes.[97]

Medical abortion in the second trimester

Mifepristone and misoprostol

RCOG reports mifepristone and misoprostol as an appropriate, safe and effective method for mid-trimester medical abortion, with shorter induction to abortion intervals than methods using prostaglandin alone or supplemented by oxytocin.[1] It summarises many studies of regimens for second trimester medical abortion. A recent report substantially extends one of the larger series referred to in the guideline.[98]

The RCOG guideline and the studies cited within it include several regimens for mifepristone followed by misoprostol (orally or vaginally). Sublingual administration of misoprostol has also been reported.[1,99,100]

Mean or median induction to abortion intervals after first prostaglandin dose were reported as 6-7 hours, with around 10% requiring surgical evacuation of the uterus.[1] One large series found dosage and induction to abortion interval significantly higher at gestations of 17-21 weeks than at 13-16 weeks, with the mean induction-abortion interval approaching 9 hours in the later gestation group.[98] This study reported abortion in 97% of women within 24 hours of the first misoprostol dose.

Similar outcomes have been achieved with mifepristone/gemeprost combinations. Regimens and outcomes are included in the RCOG report.[1]

Prostaglandin alone

There is now little data being produced from countries where mifepristone is available, but the following outcomes have been reported for prostaglandin-only regimens for second trimester medical abortion, including in Australian studies.[14,101-107]

Reported abortion rates range from 60-85% by 24 hours and 75-100% by 48 hours for misoprostol in the mid-trimester while the mean or median time between the commencement of treatment and abortion ranges from around 14 hours to 24 hours, significantly longer with oral than with vaginal administration. Surgical evacuation rates range from 10-60%. Several studies have reported higher abortion rates and shorter induction-abortion intervals in cases involving fetal death than in those with a live fetus. Treatment protocols have varied considerably and there remains no agreed optimal dosage regimen for the use of misoprostol alone for termination of pregnancy in the second trimester.

Methotrexate and misoprostol

There is little reported on the effectiveness or safety of methotrexate plus prostaglandin regimens in the second trimester.

Risks and complications of midtrimester medical abortion

Adverse effects include fever, nausea, vomiting and diarrhoea as previously described for medical abortion, but more serious complications such as uterine rupture, haemorrhage requiring blood transfusion and cervical lacerations are uncommonly reported.[14]

There were nine blood transfusions, one hysterotomy, one "myometrial tear" and no other case of uterine rupture or cervical tear in the total of 2200 mid-trimester medical terminations with mifepristone and prostaglandin reported in four large recent series.[98,108-110] There were 13 transfusions among 817 mid-trimester terminations with a variety of prostaglandin-only regimens included in three recent reports.[102,104,111]

RCOG notes that uterine rupture has been reported in association with mid-trimester medical abortion, but estimates the risk at well under 1 in 1,000.[1] Most reports of uterine rupture associated with second trimester use of prostaglandins are of single cases after 20 weeks gestation, commonly with risk factors such as the presence of a uterine scar and often with prolonged and/or repeated courses of prostaglandins and/or oxytocin. In addition to the myometrial tear mentioned above, four case reports of uterine rupture prior to 20 weeks gestation were found: one of these occurred after only two doses of vaginal prostaglandin and another in the presence of a uterine abnormality.[112-115]

Comparison of medical and surgical methods

There are few randomised trials comparing medical and surgical approaches for termination. A Cochrane review found that medical methods for abortion in early pregnancy can be safe and effective, with the most evidence of effectiveness for a combination of mifepristone and misoprostol.[116] However only six relatively small trials met the criteria of the review and inadequate evidence was found to comment on the acceptability and side effects of medical compared to surgical first-trimester abortions. The following findings are reported in reviews and the larger of the more recent case series and cohort studies in the literature.

First trimester

Failure rates of medical termination procedures generally refer to ongoing pregnancy plus incomplete abortion rates, together indicating the need for a surgical procedure. For surgical abortion procedures failure usually refers to ongoing pregnancy rates, with incomplete abortion and/or retained products of conception rates considered separately as complications. Reported effectiveness rates may therefore not be strictly comparable. The following information on side effects and outcomes is based on a combination of randomised, partly randomised and cohort studies.

Bleeding is heavier and/or more prolonged following medical termination,

but most studies do not report a clinically important lowering of haemoglobin levels.[34-37,116-120]

These studies consistently found higher rates of other side effects for medical terminations, including nausea, vomiting, diarrhoea and need for analgesia.[34,35, 37,117-119,121] Rates of serious complications are not reported to differ.

Time for return to normal activities was similar.[119,122] There is some evidence that infection rates may be lower following medical than surgical abortion: three studies have found higher rates of presentation to general practitioners and postoperative prescription of antibiotics following surgical abortion,[119,122,123] consistent with the very low infection rates following medical abortion reported in a recent review.[92]

Elul *et al* noted a higher incidence of "side effects" following medical than surgical abortion, but observed that pain and bleeding could be regarded as symptoms of the intended effect of the treatment, namely miscarriage.[124] Wellbeing was comparable in both groups and satisfaction was greater in the medical group in this study.

In general the comparative studies have found no differences in psychological outcomes related to treatment modality, while most have found improvement in psychological indicators after termination compared with before.[118-121,125-128] One recent study did find some differences in anxiety and self-esteem changes, although not morbidity, between women having medical and surgical abortion at 10-13 weeks gestation.[129] The authors believed their findings supported the availability of medical abortion at these gestations, while emphasising the importance of good information in assisting women to make choices regarding termination method.

In summary, with medical as compared to surgical termination:

- drug side effects are more common (nausea, vomiting, diarrhoea, fever, chills, flushes);
- pain is more common and more prolonged, up to 90% experiencing cramps, which for most are moderate and acceptable, but greater than menstrual pain;
- bleeding is more prolonged, most reports suggesting an average around 14-17 days with ranges from 1-69, but actual fall in haemoglobin unknown;
- the timing of expulsion of the products of conception may not be clear;
- there is at least a theoretical risk of teratogenicity if the termination fails and the pregnancy continues although normal pregnancy outcomes have been reported. This could also apply to cervical priming if a termination is not proceeded with;
- there are no complications related to instrumentation (unless surgical intervention is required); and
- there are no anaesthetic complications unless anaesthesia is required to deal with a complication.

Second trimester

Comparative studies of medical and surgical methods for second trimester termination of pregnancy are very scarce; there are wide differences in practice, depending on practitioner experience and preference in one or other method.

A recent retrospective American study found that the overall complication rate was lower for the 139 women who underwent D&E than the 158 who had a medical abortion (all medical methods combined), principally because of higher rates of failed initial method and retained products of conception.[130] Medical abortions where misoprostol was the main method used were associated with fewer complications than were other medical methods and the rate of serious complications was low and similar in medically and surgically treated groups; there were some differences between the groups.

A planned randomised trial comparing mifepristone-misoprostol with D&E was abandoned as most women approached had a strong preference for D&E abortion.[131] Among the 18 women treated prior to the abandonment of the study, the 9 who received medical treatment had more adverse events than did those randomised to D&E, including fever, retained products of conception and retained placenta.

Choosing a method

RCOG states that ideally abortion services should be able to offer a choice of recommended methods,[1] but it is acknowledged that local expertise and infrastructure may limit modalities offered. An audit of services in England and Wales found that only 33% of 194 units with facilities for abortion before 13 weeks provided both medical and surgical methods, with the majority of services offering surgical abortion only.[132] After 13 weeks gestation only 25% provided both medical and surgical abortion, with the majority providing medical procedures only. RCOG recognises that late in the second trimester, special expertise and particular staff attitudes are required for surgical abortion and considers that "for gynaecologists lacking the necessary expertise and caseload, and for their patients, mid-trimester medical abortion using mifepristone plus prostaglandin is appropriate".[1]

Studies reporting women's preferences suggest that a substantial proportion of women prefer medical methods when available and a substantial proportion prefer surgical methods. In different populations there may be different proportions with preference for medical or surgical methods.[121,123,126] Several studies have presented evidence that women value choice and are more likely to be satisfied with a method they choose.[35,125,133]

Even when there is no choice or a method is chosen for them, most women are satisfied with the method used and would again choose this method or recommend

it to a friend.[37,134] There is evidence that in some populations, if no preference is expressed, surgical termination is likely to be more acceptable, particularly after 50 days gestation.[133] A selected group of 38 Australian women having a medical abortion reported a high level of satisfaction with the method, with those who had had a prior surgical abortion finding the medical approach more acceptable.[135]

The following reasons were found for preferences for one or other method:[83,85,118,123,133,135-137]

Those who prefer surgical methods:

- like the lower number of visits required (particularly if they live at a distance from the treatment centre)
- like the same day time course of the procedure
- may use general anaesthesia to be unaware of the procedure
- wish to avoid seeing the products of conception
- view medical methods as too slow, with more side effects related to drugs and psychologically worse

Those who prefer medical methods:

- like the low risk of requiring a surgical procedure and/or anaesthesia
- perceive the method as more like a "natural" miscarriage
- may wish to verify expulsion of conceptus
- feel it leaves them more in control
- feel they afford more privacy
- see surgery as more invasive, too fast and psychologically worse

The disadvantages of medical methods are seen as:

- the greater chance of failure
- the uncertain time frame
- the need for several visits
- the greater degree of blood loss and pain

There is very little information in the literature about women's experiences or views about recognising a fetus in the tissue passed. Most reports refer to the passage of a sac and/or bleeding and pain and this is not usually reported as a major concern for women who choose the method.

Women were likely to see their preferred method, whether medical or surgical, as less traumatic, less dangerous and involving less risk for future pregnancies.

Long-term risks associated with termination of pregnancy

Most of the information about long-term outcomes of pregnancy termination relates to suction curettage and/or unspecified procedures, the majority of which are likely to have been suction curettage. The pattern may change over time with the increasing uptake of medical abortion in many parts of the world. One small study compared outcomes of first trimester medical and surgical abortion after 2 years and found no differences.[125]

Thorp *et al* recently reviewed long-term outcomes after abortion and noted the sparseness of data, the small size and flawed nature of many studies and the intertwining of conclusions with political agendas of authors and publishers.[138]

Difficulties of ascertainment of abortion exposure due to recall or reporting bias and the difficulty of selecting appropriate comparison groups bedevil research in this area. Further, "effect sizes are small with risk ratios when present falling in the range of a doubling or less of risk for comparatively rare outcomes".[138]

This summary draws on available reviews and has not attempted to reinterpret the data in view of the complexities and uncertainties which exist. Primary sources are included in the reviews cited.

Psychological effects

A literature review of the psychological consequences of termination of pregnancy examined a total of 72 studies and a further 27 review articles.[139] The quality of the studies (including sample sizes, sample selection, validity of measures and other parameters) was found to vary considerably. Nevertheless, a number of consistent trends emerged:

- The overwhelming indication is that legal and voluntary termination of pregnancy rarely causes immediate or lasting negative psychological consequences in healthy women.
- The following factors seem to predict negative psychological outcomes: certain personality traits including impulsivity, attachment, low self esteem and dependency, late gestation abortion, prior psychiatric illness, and conflict with religious or cultural beliefs.
- Overall, the research seems to suggest that greater partner or parental support improves the psychological outcomes for the woman and that having an abortion results in few negative outcomes to the relationship.
- Comprehensive reviews of the adolescent-specific literature have concluded that the effects on younger women are mild and transitory and that other confounding factors may influence negative outcome.

- The decision to terminate a pregnancy due to medical or genetic reasons seems to have more of a negative impact often eliciting grief and depression amongst women.
- Some studies have reported positive outcomes such as relief.

Outcomes such as grief do occur and for some women there can be difficulty coping. There is a lack of comparative literature, but similar reactions occur following miscarriage and regrets are reported both after termination and continuing pregnancy. The studies suggest usually positive outcomes in the short term, and where negative outcomes occur these diminish over time.

The review of Thorp *et al*[138] presented ten studies which met their criteria. These studies reported some associations between abortion and subsequent mental health outcomes such as suicide, as well as an association between pre-existing depression and subsequent regret. The authors noted that these associations might indicate either common risk factors, such as depression, for abortion and suicide attempts or harmful effects of abortion on mental health.

The majority of the studies included in the Bonevski and Adams review[139] were empirical studies involving interviews or questionnaires, while several of the Thorp studies were record linkage studies, with more limited capacity to examine causality.

RCOG concludes that "some studies suggest that rates of psychiatric illness or self-harm are higher among women who have had an abortion compared with women who give birth and to non-pregnant women of similar age. It must be borne in mind that these findings do not imply a causal association and may reflect continuation of pre-existing conditions."[1]

Reproductive outcomes

Future fertility

The evidence suggests that, overall, in countries where termination of pregnancy is available within the law, a woman who has an uncomplicated termination is not at increased risk of being infertile in the future.[1,138]

Miscarriage

There is a possible small increase in the risk of subsequent miscarriage, which may be related to a short interval between termination and subsequent pregnancy: findings are inconsistent.[1,138]

Ectopic pregnancy

Evidence does not support an association between pregnancy termination and subsequent ectopic pregnancy.[1,138]

Pre-term birth

There is a possible increased risk of preterm birth for women who have had a prior termination, although studies continue to report mixed findings. Some suggest the risk increases with an increasing number of terminations and some that increased risk applies also or only to miscarriage.[1,138]

Placenta praevia

RCOG considers that the evidence does not support a relationship between abortion and subsequent placenta praevia, although some studies have suggested a positive association.[1,138]

Breast cancer

In recent years there has been epidemiological debate about a possible association between induced abortion and breast cancer. A number of studies have looked at the influence of induced or spontaneous abortion on breast cancer risk; however the quality of the studies varies, and results have been inconsistent.[1,138,140,141]

A comprehensive analysis of data from 53 studies including 83,000 women with breast cancer concluded that "pregnancies that end as a spontaneous or induced abortion do not increase a women's risk of developing breast cancer" and that studies of breast cancer with retrospective recording of induced abortion yielded misleading results.[140] Data were analysed separately for spontaneous and induced abortion.

RCOG states that "induced abortion is not associated with an increase in breast cancer risk"[1] and the American College of Obstetricians and Gynaecologists that "rigorous recent studies argue against a causal relationship between induced abortion and a subsequent increase in breast cancer risk".[141]

Outcomes of complicated procedures

Long term complications could be expected to be more frequent in women who have immediate or short term complications of termination procedures, but most follow up studies do not differentiate between complicated and uncomplicated procedures. A Danish study which examined this[142] found no differences in the rates of miscarriage or preterm birth, but a possibly higher stillbirth rate in those who had complications compared with those who did not.

Surgical trauma

There may be long term complications when there are acute surgical complications such as uterine perforation. Outcomes will depend on the nature of the trauma and treatment for example the exceptional case when open surgery is required to repair damage to uterus or bowel may result in pelvic infection and/or intra-abdominal adhesions, which may in turn lead to infertility.

Ascherman's syndrome is rare and unreported in most studies, a Canadian study reporting a rate of less than one per thousand.[70] It results from removal of the basal layer of the endometrium, causing scarring which may result in amenorrhoea, infertility or repeated early miscarriage.

Infection sequelae

In addition to immediate morbidity, pelvic inflammatory disease may lead to tubal infertility or ectopic pregnancy in the longer term. Women are at increased risk of symptomatic infection if they have *C. trachomatis*, *N. gonorrhoea* or bacterial vaginosis in the lower genital tract at the time of the termination, but prophylactic antibiotics do decrease the risk of clinical infection.[1,55,143] Surgical complications such as uterine perforation may also increase the risk of infection.

Conclusion

This resource document for health professionals summarises current medical evidence and reference material about methods of termination of pregnancy prior to 20 weeks gestation.

Varying infrastructure and legal frameworks mean that not all methods are available in all jurisdictions: practitioners need to inform themselves about local conditions.

This resource has not addressed the important issues around counselling and decision-making: education about these matters is essential for health professionals working in women's health.

Health professionals have an important role in prevention of unintended or unwanted pregnancy, through taking up opportunities for individual counselling and population health promotion about relationships, safe sex and contraceptive use.

Additional resources

The following resources may be of interest and assistance. Where website URL addresses are included, these were accessed in November 2005. Women seeking assistance should contact their general practitioner or local family planning organisation.

Guidelines

Detailed guidelines on termination of pregnancy are published by:

- RCOG[1]
  http://www.rcog.org.uk/index.asp?PageID=662
- WHO[10]
  http://www.who.int/reproductive-health/publications/safe_abortion/safe_abortion.pdf
- New Zealand's Abortion Supervisory Committee[11]

Local sources/resources

- Abortion services in New Zealand (Istar): http://www.abortion.gen.nz/

  New Zealand Ministry of Health consumer information:
  http://www.moh.govt.nz/moh.nsf/ 49ba80c00757b8804c256673001d47d0/da3e31ab1e3a5b594c256826000651bc?OpenDocument
- Western Australia Department of Health booklet for medical practitioners:
  http://www.health.wa.gov.au/publications/documents/abortion%20report%20final2.pdf

  Its notification process is at:
  http://www.notifications.health.wa.gov.au/notifications/maternal/abortions.cfm
- New South Wales Department of Health policy directive:
  http://www.health.nsw.gov.au/policies/pd/2005/pdf/PD2005_587.pdf
- Victorian Department of Human Services consumer information:
  http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/hc_reproductivesystem?OpenDocument
- Tasmanian Department of Health and Human services information is under review.
- Queensland Health consent forms for termination procedures:
  http://www.health.qld.gov.au/informedconsent/ConsentForms/obgyn/O&G_26.pdf
  http://www.health.qld.gov.au/informedconsent/ConsentForms/obgyn/O&G_27.pdf

Legal issues

Children By Choice provides a summary of current Australian legislative provisions relevant to abortion.
http://www.childrenbychoice.org.au/nwww/auslawprac.htm

A parliamentary research paper published in 1998 summarises the history of legislation in Australian jurisdictions, but is out of date in respect of several states (Natasha Cica: Abortion Law in Australia: Research Paper 1 1998-1999).
http://www.aph.gov.au/library/pubs/rp/1998-99/99rp01.htm

A book by Loane Skene entitled *Law and Medical Practice - Rights Duties Claims and Defences* includes consideration of relevant issues as well as broader medico-legal issues. (Published in February 2004 by Lexis Nexis Butterworths)

Policy and other issues

The RANZCOG has published statements on:

- Termination of pregnancy
  http://www.ranzcog.edu.au/publications/statements/C-Gyn17.pdf
- Mifepristone
  http://www.ranzcog.edu.au/publications/statements/C-gyn14.pdf
- Misoprostol
  http://www.ranzcog.edu.au/publications/statements/C-obs12.pdf

The Public Health Association of Australia produces a resource entitled *Abortion in Australia: public health perspectives*.
http://www.phaa.net.au/abkit/PHAAAbortionkit.pdf

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