Non-oral contraception

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Abstract

Non-oral contraception is increasingly being promoted by contraceptive experts as a more convenient and, in many cases, safer and more efficacious alternative to oral contraception. Injectables, implants and intrauterine methods offer the advantage of being long-acting and less user dependent, factors which may potentially improve contraceptive compliance. Combined contraceptive methods in non-oral delivery forms offer a choice for women who find it difficult to adhere to daily use. The barrier methods, particularly the male and female condoms, offer user-controlled but default-vulnerable protection against sexually transmitted infections.

Keywords condoms; contraceptive implants; contraceptive patch; depot medroxyprogesterone acetate; intrauterine device; non-oral contraception; vaginal contraceptive ring

In the UK, as in much of the developed world, the combined oral contraceptive (COC) pill is the most popular reversible method of contraception. Despite a variety of non-oral methods entering the market in the last decade, the reported use of the contraceptive pills has remained constant in the UK during this time. A proportion of women possibly remains unaware of all the contraceptive options available and may be uninformed of the benefits many of the non-oral methods offer. Most non-oral methods do not rely on daily compliance and indeed, increased uptake of the longer-acting, reversible methods (such as the intrauterine devices and subdermal implants), may enhance other public health measures to reduce unplanned pregnancies. The other group of non-oral methods are the male and female barriers, which although relying on reliable self-directed use, offer the advantage of protection against sexually-transmitted infections (STIs). This discussion will highlight some of the new developments in the field of contraception with respect to non-oral methods.

Research into alternative methods of contraception that avoid dependence on daily adherence has resulted in a number of new products. These include the EVRA patch and the combined contraceptive vaginal ring (NuvaRing). Long-acting progestogen methods too have increased in popularity with a variety of delivery mechanisms, including intrauterine and subdermal. Apart from avoiding the necessity of daily compliance, some of the non-oral hormonal methods offer the advantage of direct absorption into the circulation and therefore have consistent bioavailability, thereby providing lower or comparable doses of circulating hormone, but with a steadier release.

Although most women using contraceptive methods are medically fit, comorbidities may lead to unacceptable health risks with particular contraceptives. An essential resource to indicate which women are eligible for a particular method is the UK version of the WHO Medical Eligibility Criteria for Contraceptive Use (UKMEC), published in 2006 (Table 1). The efficacy of each of the methods is listed in Table 2, which documents rates of both perfect use (failure rates for women when contraception is used every time they have sexual intercourse and used according to instructions every time), and typical use (failure rates for women when contraception is not used every time they have sexual intercourse and/or it is not used according to instructions every time).

Combined hormonal contraceptives

The vaginal ring

The combined vaginal contraceptive ring (VCR) is a flexible 54-mm silicone vaginal ring. Most published trials have examined the one ring available on the market, the NuvaRing ® (NV Organon Oss, The Netherlands) which releases 15 μg of ethinyl oestradiol (EE) and 120 μg of etonogestrel/day in a sustained release fashion.

The ring is inserted high in the vagina and left in situ for 3 weeks. After 3 weeks the ring is removed to allow for a hormone-free interval of 7 days during which the user experiences a withdrawal bleed. A new ring is then inserted. The ring's hormone reservoir has enough hormone for a fourth week to allow for users forgetting to change it on time. The ring can be removed for up to 3 hours without loss of efficacy. However, if removed for longer than 3 hours, the ring should then be re-inserted and extra precautions used for 7 days. Several studies have found the

United Kingdom Medical Eligibility Criteria (UKMEC) Classification

Category	Definition of category
1	Condition for which there is no restriction of use
2	Condition for which the advantages of using the method generally outweigh the theoretical or proven risks
3	Condition where the theoretical or proven risks usually outweigh the advantages of using the method
4	Condition which represents an unacceptable health risk if the contraceptive method is used

Table 1

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Efficacy of non-oral methods

	Women having an unintended pregnancy in the first year of use (%)	
	Typical use	**Perfect use**
Male condoms	15	2
Female condoms	21	5
Diaphragms and caps	16	6
Vaginal ring	8	0.3
Contraceptive patch	8	0.3
Injectables	3	0.3
Implants	0.05	0.05
Intrauterine device	0.8	0.6
Intrauterine system	0.2	0.2

Adapted from Trussell J. Contraceptive efficacy. In: Hatcher RA, Trussell J, Nelson AL, Cates W, Stewart FH, Kowal D (eds). *Contraceptive Technology*, 19th revised edn. New York: Ardent Media, 2007.

Table 2

efficacy of the VCR to be comparable to that of the COC and to have similar tolerability.

The key advantages are that the ring does not require daily administration, it uses lower doses of contraceptive hormones and its controlled release delivery avoids daily fluctuations in hormone levels. Maximum serum concentrations of EE and etonorgestrel are achieved 1 week after insertion and are 60–70% lower than the peak concentration when taking a COC with 150 μg desogestrel and 30 μg of EE. The theoretical advantage of better compliance has not been substantiated in published trials, but is cited by users as a major advantage. Discontinuation rates have been similar to those in women taking a COC. Cycle control has generally been found to be good or superior.

Women experience the hormonal side effects of nausea, breast tenderness and headache, as with other COC methods. However, vaginal irritation and discharge are increased with ring use compared to COC use, and are reported in around 10% of users. The VCR has the same contraindications as all other COCs (Table 3). Evidence suggests no detrimental effect on cervical or vaginal epithelium.

Future developments

Extended-use rings that can be left in situ for 3 – 6 months would further boost compliance and are being evaluated. Progestogen-only vaginal rings have been developed on a small scale in some regions, such as South America, but are unlikely to become widely available.

Contraceptive patch

The currently available contraceptive patch is the Ortho Evra® transdermal patch, which delivers 20 μg of EE and 150 μg of norelegestromin/day. The patch produces plasma levels higher than comparable oral preparations but without the peaks and troughs of the oral regimen. The first-pass hepatic effect is similar to that for oral pills. The patch is licensed for two-cycle continuous use. A patch is applied weekly for 3 weeks, followed by a patch-free week.

UKMEC category 4 (a condition which represents an unacceptable health risk if the contraceptive method is used) for combined hormonal methods (vaginal contraceptive ring and contraceptive patch)

- Breastfeeding – <6 weeks postpartum
- Smoking – aged ≥35 years and smoking ≥15 cigarettes/day
- Obesity – BMI ≥40 kg/m^2
- Cardiovascular disease – multiple risk factors for arterial cardiovascular disease
- Hypertension – blood pressure ≥160 mmHg systolic and/or ≥95 mmHg diastolic; or vascular disease
- Venous thromboembolism – current (on anticoagulants) or past history
- Major surgery with prolonged immobilization
- Known thrombogenic mutations
- Current and history of ischaemic heart disease
- Stroke
- Valvular and congenital heart disease – complicated by pulmonary hypertension, atrial fibrillation
- Migraine headaches – with aura at any age
- Gestational trophoblastic neoplasia – when human chorionic gonadotrophin is detectable
- Breast disease – current breast cancer
- Diabetes – with nephropathy, retinopathy, neuropathy or other vascular disease, or diabetes of >20 years' duration (category given will depend on disease severity)
- Viral hepatitis – active disease
- Cirrhosis – severe decompensated disease
- Liver tumours – benign and malignant
- Raynaud disease – secondary with lupus anticoagulant and thus a tendency to thrombosis

Table 3

It exerts its contraceptive effect through suppression of ovulation and the secondary effects of cervical mucus and endometrial suppression. If the first patch is applied on days 1–5 of the cycle, no extra precautions are required. Detachment is uncommon, but where this does occur, extra precautions are only required if this is for greater than 24 hours. Extending the patch-free interval for more than 7 day risks pregnancy. The contraindications to the patch are the same as for the COC pill (Table 3).

The continuation rates with the patch have been found to be lower compared to the COC, although in those women who continue to use it, there is good compliance. Around 10% of women may develop application site reactions. Breast tenderness and nausea are more common in patch users compared to COC users, but resolve by the third cycle of use. Pharmacokinetic studies have found higher mean oestrodiol levels in women using the patch compared to COCs and VCR, and therefore the theoretical increased risk of venous thromboembolism and cardiovascular events has been raised. No studies have definitely confirmed an excess risk and the patch is rated a category 4 (unacceptable health risk) in the presence of a history of thromboembolic, cardiovascular or cerebrovascular disease, which is the same classifications as oral contraception (Table 3).