Obstetrics & Gynecology
TEAM

Contraception

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◆very important ◆mentioned by doctor ◆team notes ◆not important

Types of birth control:

A) Reversible:

1) Hormonal. (Oral – injection – implant)
2) Intrauterine Contraception Devices (IUCD).
3) Barrier Method. (E.g. coitus interruptus, simple and doesn't have side effects but it has high failure rate because sperm may enter the vagina if withdrawal isn't properly timed or if pre-ejaculation fluid contains sperm).
4) Natural Methods.
5) Spermicides.

> Coitus interruptus "the withdrawal method" is the practice of withdrawing the penis from the vagina and away from a woman's external genitals before ejaculation to prevent pregnancy.

B) Irreversible (Surgical Methods):

1) Tubal ligation. Laparoscopic sterilization: Rings – Clips – Bipolar diathermy – Lazer.
2) Vasectomy.

The Ideal contraception method should be:

- Acceptable – requires no user motivation so compliance not problem.
- Safe.
- Accessible.
- Less side effects.
- Low failure rate.
- Non-invasive.
- Rapid reversible.
- Prevention of STD.

Type 1 - Reversible Methods

1) Hormonal

A) Combined Oral Contraceptive pills:

- Combined Oral Contraceptive (COC) contains a mixture of estrogen and progesterone.
- Progesterone only contraception:
  - Pills - levonoregesterol.
  - Injectable - DMPA (Depot Medroxyprogesterone Acetate).
  - Subdermal implant.

- Pills are safe and effective when taken properly. They are over 99% effective. (Must be taken in 3 hours time window e.g. if the woman decided to take it at 8 p.m. she must take it everyday between 8-11 p.m.)

- Estrogen component of most modern COC:
  - ethinyloestradiol (EE) 20-50 ug. (Estrogen suppresses lactation and has risk of thrombosis)

- Progesterone Component:
  - Second generation (e.g. norethisterone and levonorgestrill)
  - Third generation (e.g. desogestrel and gestodene)
  - Third generation have higher affinity for progesterone receptors and lower affinity for the androgen receptor than second generation, i.e. they confer greater efficacy with few androgenic side effects.
  - Third generation also have fewer effects on carbohydrate and lipid metabolism.

Mechanism of action: (MCQs)

- Stop ovulation by inhibition pituitary FSH and LH secretion.
- Cervical mucus becomes scanty and viscous with law spinnbarkeit and thus inhibits sperm transport. (Spinnbarkeit is the stringy, elastic character of cervical mucus)
- Thins uterine lining (endometrium lining) and become unreceptive to implantation.
- Direct effect on fallopian tubes impairing sperm and ovum transport.

Combined oral contraceptive formulation is either:

- Fixed dose.
- Phasic: the dose of estrogen and progesterone changes once (biphasic) or twice (triphasic) in each day course. They are designed to mimic the cyclical variation in hormone levels.

Positive benefits of Oral Contraceptive pills (OCP):

- Prevent pregnancy.
- Less dysmenorroea and menorrhagia.
- Less incidence of carcinoma of the endometrium and ovary.
- Less incidence of benign breast disease.
- Less incidence of pelvic inflammatory disease (PID). (Can relief pain)
- Less incidence of ovarian cyst.
- Protective effect against rheumatoid arthritis, thyroid disease and duodenal ulceration.
- Less acne.

Side effect and risks:

- Weight gain – with pills containing Levonoregestrel (2nd generation) but not desogestral or gestodene (3rd generation).
- Carbohydrate metabolism – effect on insulin secretion.
- Lipid metabolism – effect ratio of HDL/LDL.
- No protection from STDs.
- Cardiovascular effects – increase risks of thromboembolism by three to four fold in women with risk factors: congenital acquired throbophilias, obesity, advanced age and immobility
- Myocardial infarction and hemorrhagic stroke and increased with:
  - ↑ Oestrogen dose.
  - Hypertension.
  - Smoking.
- Breast Cancer – long term oral contraceptive user before age 25 specially with more potent progesterone.

- Cervical cancer – ↑ incidence due to ↓ immunity to antigenic causal factor, with greater sexual activity without benefits of Barrier contraception.

Contraindication: (we are taking about absolute contraindications)

- Arterial or venous thrombosis.
- Ischemic Heart disease.
- Focal migraine.
- Athcrogenic lipid disorder.
- Inherted or acquired throbophilias.
- Post-cerebral hemorrhage.
- Pulmonary hypertension
- Disease of Liver: Acute liver disease i.e. with
  - Abnormal LFT test
  - Adenoma or Carcinoma
  - Gallstones
  - Acute Hepatic prophyrias.
- Others:
  - Pregnancy.
  - Undiagnosed genital tract bleeding.
  - Estrogen dependent neoplasm e.g. Breast Cancer.

B) Progesterone only contraceptive (also called Mini Pill)

Mechanism of action:

- Supression FSH and LH secreation and inhibits ovulation.
- Cervical mucus modification, which inhibits sperms penetration.
- Endometrial modifications to prevent implantation.

Advantage of progesterone only contraception:

- Minimal impact or lipid profile and hypertension so can be used in cardiovascular disease.
- Used by lactating mother.
- Advantages of Depot Medroxyprogesterone Acetate (DMPA):
  - Protection against endometrial cancer.
  - Protection against Acute PID.
  - Protection against Vaginal candidiasis.
  - Protection against ovarian cancer, endometriosis and fibroids.
  - Relief dysmenorrhea and pre menstrual syndrome.
  - No daily pills to remember.
  - Given once every 3 months.
  - 99.7% effective preventing pregnancy.

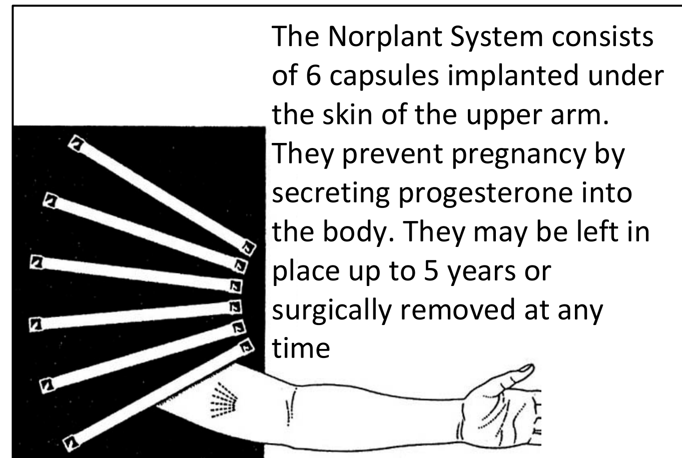
Disadvantages of Progesterone only Contraception:

- Menstrual disturbance – ammenorrhoea with injection.
- Irregular prolonged spotting or bleeding with pills.
- May develop functional ovarian cyst due to luteinzation of unruptured ovarian follicle.

- Protect against intrauterine pregnancy but not ectopic because it modify tubal function - ↓ ovum transport.
- Acne, headaches, Breast tenderness and lose of libido (androgenic progesterone).

Sub dermal implants:

- Need trained personal for insertion and removal.
- Out patients procedure.
- 99.5% effectiveness rate.
- No user motivation i.e. compliance isn't a problem.
- Amennorhoea is common.



The Norplant System consists of 6 capsules implanted under the skin of the upper arm. They prevent pregnancy by secreting progesterone into the body. They may be left in place up to 5 years or surgically removed at any time

Failure of the Pill:

- If the patient forgets to take the pill.
- Gastroentroentritis.
- Drugs:
  - Anticonvulsant: phenytoin, phenobarbitone. (Affect the metabolism of the contraceptive)
  - Antibiotics. (Change intestinal flora → affects the metabolism. E.g. ampicillin and rifampin)

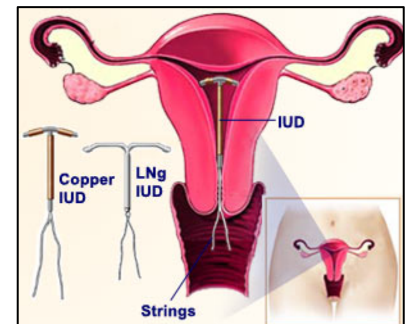
2) Intrauterine Contraception Devices

- Most commonly used reversible method of Contraception worldwide
- Effective > 97%.
- The newer devices have failure rate < 0.5%

Three Types of IUCD:

A) Inert:

- These are polythene IUCD, bulkier than other types.
- More likely to cause heavy bleeding and pelvic actinomyosis.
- No longer available.



B) Copper bearing IUCD:

- Consist of a plastic frame with copper wire around the stem.
- Surface of the copper determine the effectiveness and active life of the device.
- Most IUCD licensed for use over 5-10 years and because of gradual absorption of copper, these IUCD are renewed after 3-5 years.
- Copper salt gives some protection against bacterial infection.

C) Hormone releasing IUCD (Mirena):

- Releasing levonoregtrel (20ug/24hrs) over at least 5 years.
- Reduce menstrual, blood flow and markedly reduces Blood loss in menorrhagia.
- Protect against pelvic inflammatory disease.
- Cause irregular uterine bleeding for first 6 months following insertion.

Mechanism of Action:

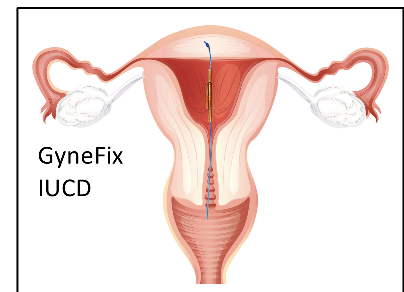
- All IUCD cause a foreign body reaction in the endometrium with increased prostaglandin production and Leucocyte infeltration. This reaction enhanced by copper which effect endometrial enzymes and oestrogen uptake and also inhibit sperm transport.
- Alteration of uterine and tubal fluid impairs the viability of the gametes.
- The progesterone IUCD (LNG.IUS) cause endometrial suppression and change in the cervical mucus and utro tubal fluid impair sperm migration.

Complications:

- Dysmenorrhoea and Menorrhagia:
  - Antifibrilolytic agent tranexamic acid.
  - Antiprostaglandin agents.
  - Non-steroidal anti-inflammatory drugs.
- Infection – Actinomycosis associated with granulomatous pelvic abscesses.
- Pregnancy rate 1-1.5% most likely in the first 2 years. Copper bearing has lower rate 0.5% and levonoregtrel 0.1%.
- Risk of ectopic pregnancy is greater with IUCD especially progesterone releasing IUCD.
- Expulsion of the device 5-10% in just 6 months. Usually during menstruation.
- Translocation – the IUCD passes through uterine wall into the peritoneal cavity or blood ligament usually a consequence of unrecognized perforation at insertion – laparoscopy should be performed.

Contraindications:

- Pelvic inflammatory disease.
- Menorrhagia.
- History of previous ectopic pregnancy.
- Severe dysmenorrhea.



Choices of Devices:

- Copper T380 is the first choice as it has the lowest failure rate and longest life span.
- Women with:
  - Small uterus
  - Experienced pain
  - Spontaneous expulsion

  } GyneFix IUCD
- Women with Menorrhagia are given Levonorgestrel – releasing (LNG – IUCD)

3) Barrier method

- Prevent pregnancy by blocking the eggs and sperm from meeting.
- Have higher failure rate than hormonal methods due to design and human errors.

Most important advantage: protection against STDs.

Barrier Methods:

- **Male:** Condom
- **Female:** Condom (Femidon) – pessaries (diaphragm, cervical cap) in combination with spermicides.

A) Condoms:

- Most common and effective barrier when used properly.
- Thin rubber sheath fits on the penis, it interfere 3-23% with sensation and it is liable to come off as the penis withdraws after the act.
- Widely accessible.
- Inexpensive.
- Reversible.
- Provide protection against STDs including HIV and premalignant disease of the cervix.
- Contraindication to the condom use is latex allergy in either partner.
- Failure rate 3-23%

B) Occlusive pessaries:

- Diaphragm, cervical cap inserted into the vagina, prior to intercourse to occlude the cervix and should be used with spermicide to provide maximum protection and remains 6 hours after intercourse.
- Initially need to be fitted by trained person.
- Needs high degree of motivation for successful use (Efficacy 4-20%).

C) Female Condom:

- Polyurethane sheath inserted to and lines the vagina.
- Wildly available.
- Failure rate 5-21%.

D) Vaginal Sponges:

- Made of polyurethane foam and one inserted with spermicide into the vagina and cover the cervix.
- Provide contraception by-acting as Barrier
    - Absorbing the semen.
    - Carrier for spermicide.
    - Higher failure rate.
    - Advantage – protection against STD.

4) Natural Methods

A) Calendar Method (Safe period):

- Relies upon the fact that there are certain days during the menstrual cycle when conception can occur following ovulation, the ovum is viable within reproductive tract for a maximum of 24 hrs.
- The life spam of sperm is longer 3 days.
- During a 28-day menstrual cycle, ovulation occurs around day 14. This means that coitus must be avoided from 8th to 17th day.
- Failure rate is high and so many couples find it difficult to adhere to this method.

B) Ovulation method (The billing's method):

Ovulation prediction can be enhanced by several complementary methods including

Measuring basal body temperature (BBT):

Progesterone causes rise in temperature by 0.2-0.4°C following ovulation until the onset of menstruation.

Observing cervical mucus:

- Several days before ovulation mucus appearance of raw egg white, clear, slippery and stretchy (spinnbarkeit). Effect of estrogen
- The final day of fertile mucus is considered to be the day when ovulation is most likely to occur and abstinence must be maintained from first day of fertile mucus until 3 days after the peak day.
- The end of the fertile period is characterized by appearance of (infertile mucus) which is scanty and viscous. (Thick mucus: infertile mucus. Sperm can't swim through thick mucus)

Failure rate of calendar method and ovulation method is is 2.8 %.

C) Personal fertility monitors:

- Small devices able to detect urine concentration of estrogen and LH indicate start and end of fertile period.
- Failure rate is 6.2%.

Disadvantage of natural methods:

No protection against STDs.

Emergency Contraception

1) Hormonal methods:

Yuzpe Regime (PC4):

- Ethinylostradiol (100μg) levonorgesterel (500μg). Trade name: Eugynon/ovran.
- First dose is taken with 72 hours of intercourse and second dose taken 12 hours after the first.
- It inhibits or delay ovulation, altering endometrial receptivity.

Progestegen only form of emergency contraception.

- Levonorgestrel (0.75 mg)
- Given twice within 72 hours of intercourse.
- It also alters cervical mucus, impairing sperm transport and prevents fertilization, which explains the greater efficacy 99% compared to Yuze regime 77% in prevention of expected pregnancy. If commenced with 24 hours of intercourse.
- Side effects:
  - Nausea and vomiting.
  - Theoretical risk to pregnancy.
  - If pregnancy occurs: increased risk of ectopic pregnancy.

2) Copper IUCD:

- Very effective if used 5 days after coitus or ovulation due to spermicidal and Blastocidal actin of copper.
- Has the lowest failure rate (<1%).
- Age, nulliparity and menorrhagia are NOT contraindications.

Type 2 - Irreversible Methods (Sterilization)

A permanent, irreversible method, performed on a man or a women.

1) Female – Tubal ligation:

- Laparoscopic sterilization (mini laparotomy): ring, clips, diathermy, laser
- Pre – counseling include:
  - Irreversible and permanent nature of the procedure.
  - Failure rate 1:200
  - Risk of laparoscopy and chance of requiring laparotomy.

2) Male – Vasectomy:

- Vas deferentia can be divided by removal of a piece of each vas under local anaesthesia.
- Advised to use effective contraception until there are two consecutive semen analyses showing azooospermia.
- Failure rate is 1:2000 and it can occur up to 10 years as a result of late recanalization.
- Minor complication can occur in 5% of patient:
  - Vaso vagal reaction.
  - Hematoma.
  - Mild infection.
  - Sperm auto antibodies – difficulty in reversing the operation.