ejpmr, 2022,9(8), 121-131

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

A REVIEW ON ORAL CONTRACEPTIVE

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Article Received on 11/06/2022 **Article Revised on 01/07/2022** **Article Accepted on 21/07/2022**

ABSTRACT

Oral contraceptive pills are a class of drugs which have been widely studied since 1960,and are used by more than 70 million women daily. In a national research conducted in the USon the contraceptive methods, it was concluded that the oral contraceptives had the highest rate of use, and using oral contraceptives was the first-grade selected method in 15-44-year-old women (18.9%). Oral contraceptives (birth control pills) are medications that are used to prevent pregnancy. Oral contraceptive, also called birth control pill, any of a class of syntheticsteroid hormones that suppress the release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) from the anterior lobe of the pituitary gland in the female body. FSH and LH normally stimulate the release of Estrogen from the ovaries, which in turn stimulates ovulation—the release of a mature egg from the female ovary. Oral contraceptives are hormonal preparations that may contain combinations of the hormones, Estrogen and progestin or progestin alone This combination inhibits ovulation, presumably by preventing release of follicle-stimulating hormone by Estrogen and luteinizing hormone by progesterone. Hormonal contraceptives may be divided into combined Estrogen-Progestogen contraceptives preparation available as pills, skin patches, vaginal rings which are monophasic, biphasic and triphasic. Progestogen-only contraceptives Preparation available as pills, injections, implants, hormone spirals which contain only one hormone, synthetic progestogen are called 'minipill' and Emergency contraception pills also called as "morning after pills". When oral contraceptives are used correctly, they are between 92 and 99 percent effective in preventing an unintended pregnancy. This review will enlightened various methods of oral contraceptives.

KEYWORDS: Oral contraceptive pills, Estrogen, Progesterone.

INTRODUCTION

The number of women using contraception in developed countries has remained relatively constant since 1982 with approximately 62% of women of reproductive age using contraception in the USA. Oral contraceptive pills are the most common method used by 28% of contraceptive users. Globally, oral contraceptive pills are used by 8.8% of contraceptive users.[1]

These are hormonal preparations used for reversible suppressions of fertility. Because of our alarming population trends, antifertility drugs are the need of the day. In developing countries particularly, the mortality rate has declined and birth rate has increased due to urbanization.In the earlier part of 20th century, methods of contraception used (Condoms, Diaphragms, Spermicidal creams, Foam tablets, etc,) were intimately related to sexual intercourse, therefore, despised by most couples. These also have higher failure rate. Rock and Pincus (1955) announced the successful use of an oral progestin for contraception, separating fertility control from coitus.

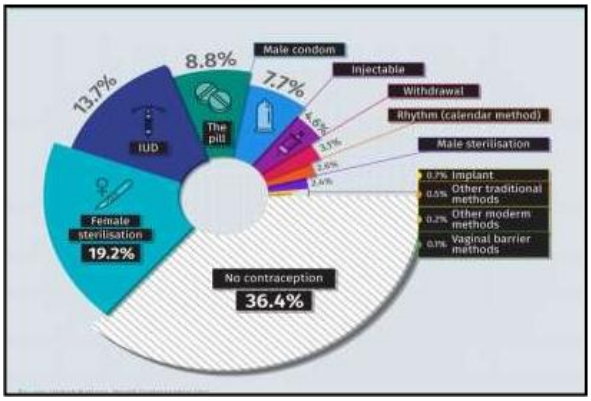

Fig. 1: Epidemiologic status of using an Oral contraceptive around the world.

It was known for several years that estrogens could prevent ovulation and, therefore, conception. However, their use for this purpose was beset with two drawbacks: firstly, the dose of estrogen has to be increased in succeeding cycles; otherwise, escape ovulation would occur; and secondly, continuous administration of large doses of estrogen would cause endometrial hyperplasia

and upset the pattern of menstruation. It was also known that large doses of progesterone could prevent ovulation, but progesterone had to be given parenterally.With the development of potent orally active progestins (norethynodrel and norethindrone), a large number of oral contraceptives containing estrogens or progestins (or both) are now available for clinical use.

Evolution of oral contraceptives[2]

There is a vast difference between the original pill and the current forms of hormonal contraception. This evolution was characterised by the reduction of hormonal dosages, introduction of new progestins, elaboration of various estrogen-progestin administration schemes and the development of alternative routes of administration. It was driven by the search for oral contraceptives causing less side effects, but also by competition between pharmaceutical companies, and was facilitated by advances in the knowledge of hormonal mechanisms and the monitoring of the endocrine and metabolic effects OCs elicit.

Definitions

Oral contraceptives are medications taken by mouth for the purpose of birth control. “Active pills” refer to the pills in the package that contain hormones. “Inactive” or “placebo” pills are members of the pill package that do not contain any hormone. Their presence in the pack is to help a women stay on schedule taking her pills. Inactive pills always have a different color from the active pills. During the days that the inactive pills are taken, a women will likelyhave a period. For years, all pill packs had 21 days of active pills and 7 days of inactive pills =28 pills creating a monthly menstrual cycle.

Combined oral contraceptives pill[3]

Combined Oral Contraceptive (COC) is composed of estrogen and progestogen. The firstCOC was introduced in 1957 in the United States for the treatment of menstrual disturbances.The combined oral contraceptive pill is extremely effective, at least in the absence of intercurrent illness and of treatment with potentially interacting drugs. The estrogen in most combined preparations (second- generation pills) is ethinylestradiol, although a few preparations contain mestranol instead. The progestogen may be norethisterone, levonorgestrel, ethynodiol, or in ‘third-generation’ pills – desogestrel or gestodene, which are more potent, have less androgenic action and cause less change in lipoprotein metabolism,but which probably cause a greater risk of thromboembolism than do second-generation preparations. The estrogen content is generally 20-50µg of ethinylestradiol or its equivalent, and a prepartion is chosen with the lowest estrogen and progestogen content that is well tolerated and gives good cycle control in the individual woman. This combined pill is taken for 21 consecutive days followed by 7 pill-free days, which causes a withdrawal bleed. Normal cycles of menstruation usually commence fairly soon after discontinuing treatment, and permanent loss of fertility (which may be a result of early menopause rather thana long-term consequence of the contraceptive)is rare.

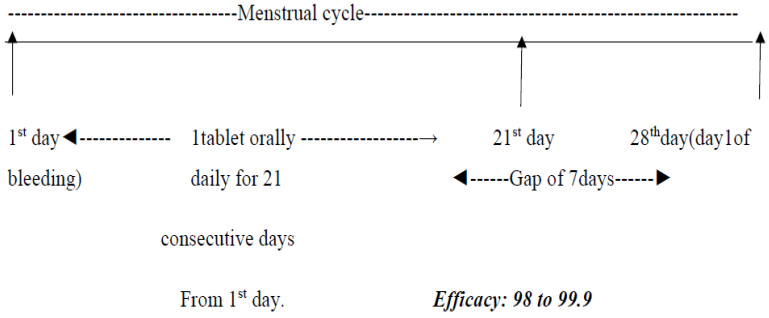

Fig. 2: Schedule for use of combinedpill

Examples of combination birth control pills include[4]

- **Azurette**
- Balcoltra
- Beyaz
- Caziant
- Cryselle
- Gianvi
- Junel
- Kariva
- Kelnor
- Levora
- Loestrin 24 Fe
- Low-Ogestrel
- Microgestin
- Necon
- Nortrel
- Ocella
- Ogestrel
- Ortho-Novum
- Portia
- Previfem
- Safyral
- TriNessa
- Trivora
- Velivet
- Yasmin
- Yaz

Fig. 3: Oral contraceptive Pills.

The mode of action is as follows

1. Estrogen inhibits secretion of FSH via negative feedback on the anterior pituitary, and thus suppresses development of the ovarian follicle.
2. Progestogen inhibits secretion of LH and thus prevents ovulation; it also makes the cervical mucus less suitable for the passage of sperm.
3. Estrogen and progestogen act in concert to alter the endometrium in such a way as to discourage implantation.

They may also interfere with the coordinated contractions of cervix, uterus and fallopian tubes that facilitate fertilisation and implantation.

Combined pills formulation are available as monophasic, biphasic or tri-phasic preparations[5]

Monophasic: In monophasic agents, fixed amounts of estrogen and progestin are present in each pill. The pill is started on the 5th day of the menstrual cycle, taken daily for 21 days followed by a gap of 7 days, during which, bleeding occurs. This is monophasic regimen.

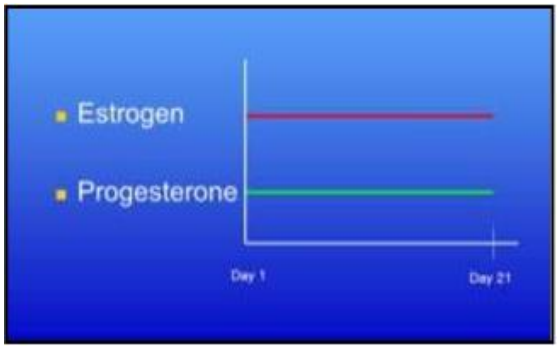

Fig. 4: Monophasic pills.

Biphasic: Oral contraceptives are also available as biphasic or triphasic preparations. This reduces the amount of hormones needed and more closely mimics menstrual cycles. Biphasic pills consist of estrogens given for 10 days followed by a progestin for the next 11 days. Because of the risk of endometrial cancer following such biphasic use of the hormones, biphasic pills are not preferred.

Triphasic: In Tri-phasic preparations, the dose of estrogen is slightly more in mid cycle but doses of progestin increase in three successive phases of menstrual cycle. Triphasic pills with low doses of an estrogen with a progestin are very effective with least side effects.

If a woman misses a pill, she should take 2 pills the next day and continue the course. If more than 2 pills are missed, then that course should be withdrawn, should follow an alternative method of contraception for that particular cycle and restart the course on the 5th day of the next menstrual cycle.

If the woman has conceived, the pregnancy should be terminated as these hormones are teratogenic. However, recent studies have shown that in such low doses, the hormones are not teratogenic.

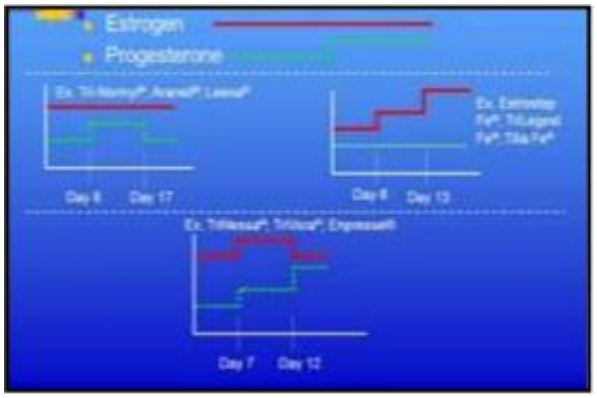

Fig. 5: Triphasic pills.

Table 1: Oral contraceptive preparations.

Brand name	Oestrogen	Progestin(mg)
Combined oestrogen and progestin preparations (combined pill)		
(a)Monophasic combination tablets		
Nelova	Ethinyl estradiol (35)	Norethindrone (1.0)
Yasmin	Ethinyl estradiol (30)	Drospirenone (3)
Ovral-L	Ethinyl estradiol (30)	Levonorgestrel (0.15)
Novelon	Ethinyl estradiol (30)	Desogestrel (0.15)
(b) Biphasic combination tablets (not marketed in most of the countries)		
NECON 10/11		
Days 1-10	Ethinyl estradiol (35)	Norethindrone (0.5)
Days 11-21	Ethinyl estradiol (35)	Norethindrone (1.0)
(c) Triphasic combination tablets:		
Days 1-7	Ethinyl estradiol (35)	Norethindrone (0.5)
Days 8-14	Ethinyl estradiol (40)	Norethindrone (0.75)
Days 15-21	Ethinyl estradiol (35)	Norethindrone (1.0)
2.Minipill (progestin-only pill)		
Micronor	-	Norethindrone (0.35)
Norgest	-	Norgestrel(0.075)

Possible Modes and Sites of action[6]

1. **Direct inhibition of spermatogenesis:** This presents many problems including the lagin onset of effect due to storage of mature spermatozoa until they are ejaculated or diefrom old storage.
2. **Indirect inhibition of spermatogenesis:** By suppression of hypothalamic-pituitary activity, which controls it, e.g. by progestogen-androgen combinations;
3. **Immunological techniques:** (Vaccines) to induce antibodies to pituitary gonadotrophins, sperm, or other components of the reproductive process in either sex;these are being developed.
4. Inhibition of ovulation presents a different and easier biological problem. There is no need to suppress continuous formation of the gametes, as in the male, but only to prevent their release from the ovary approximately 13 times a year. Either the pituitary gonadotrophin may be inhibited or the ovary may be made unresponsive to it.
5. **Prevention of fertilization:** The female genital tract may be made inhospitable to spermatozoa, e.g. by altering cervical mucus or fallopian tube function.
6. **Antizygotic drugs:** compounds effective in the rat have been developed.
7. **Inhibition of implantation:** Implantation does not occur unless the endometrium is in the right state, and this depends on a delicate balance between oestrogen and progesterone. This balance can readily be disturbed.
8. **Use of spermicides** in the vagina (in combination with barrier methods). This is strictlychemical rather than hormonal contraception, as also are intrauterine devices that contain copper, which is gametocidal.

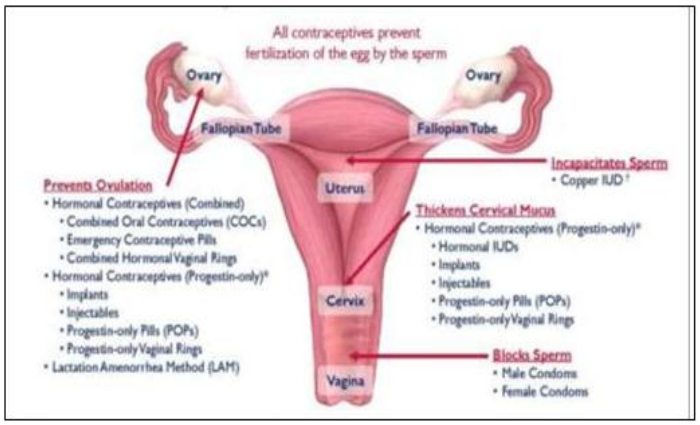

Figure 6: Mechanism of action of contraception.

Potential unwanted and beneficial effects of the combined pill

More than 200 million women worldwide have used this method since the 1960s, and in general the combined pill constitutes a safe and effective method of contraception. There are distinct health benefits from taking the pill, and serious adverse effects are rare. However, minor unwanted effects constitute drawbacks to its use, and several important questions need to be considered.

Common adverse effect

- Weight gain, owing to fluid retention or an anabolic effect,or both
- Mild nausea, flushing, dizziness, depression or irritability
- Skin changes (e.g.acne and/or an increase in pigmentation)
- Amenorrhoea of variable duration on cessation of taking the pill.

Beneficial effects

The combined pill markedly decreases menstrual symptoms such as irregular periods and intermenstrual bleeding, iron deficiency anaemia and premenstrual tension are reduced, as are benign breast disaease, uterine fibroids and functional cysts of the ovaries. unwanted pregnany, carrying a maternal mortality ranging from 1 in 10000 in developed countries to 1 in 150 in africa,is avoided.

Other uses of combined preparations[7]

1. Hormone replacement therapy
2. **Endometriosis**: Combined pills may be used continuously to induce atrophy of the endometriotic tissues. Amenorrhoea is produced.
3. **Postponement of menstruation:** Combined pills are started 2 tablets daily 3-6 days prior to the expected date of menstruation and continued till desired. Menstruation occurs 2-3 days after stopping the drug. Such use in higher dose may cause nausea and vomiting. Another way of using the hormones is to start low dose combined pill on day 7-10 (1 tab daily) and continue throughout the cycle and stop it when menstruation is desired.
4. **Premenstrual syndrome:** Oral contraceptive pills are used to suppress ovulation and continued for 3-6 cycles.
5. **Dysmenorrhoea:** If analgesics cannot be used,oral contraceptive pills may be given for 3-4 cycles.
6. **Idiopathic hirsutism:** Cyclic therapy with combined pills is useful in hirsutism.

Progestin-only contraceptive pills

The drug used in this progestogen-only pill include norethisterone, levonorgestrel and ethynodiol. They are slightly less efficacious (96-97% effective) than the combination oral contraceptives. The pill is taken daily without interruption. The mode of action is primarily on the cervical mucus, which is made inhospitable to sperms. The progestogen probably also hinders implantation. Effective contraception can also be achieved by injecting 150 mg of depot medroxyprogesterone acetate every 3 months. This preparation is not desirable for women planning a pregnancy soon after cessation of therapy. This is because ovulation suppression can persist for about 18 months after the last injection. The drawbacks include irregular menstrual bleeding,which can be heavy, breast tenderness, headache and migraine. Progestogen-only contraceptives offer a suitable alternative to the combined pill for some women in whom estrogen is contraindicated (e.g., venous thrombosis, smoking, old age and unacceptable rise in blood pressure).

Examples of progestin-only pills include[4]

- Camila
- Errin
- Heather
- Jolivette
- Nora-BE

Additional benefits of progestogen only pills[8]

Lactation: The progestogen only contraceptives can be used in lactating women because thereis no reduction in milk production and no negative effect on the newborn.

Menstrual symptoms: Contraceptive progestogens can, due to their antimitotic and transformational action on the endometrial cells reduce the frequency and intensity

of uterine bleeding. The contraceptive progestogens with ovulation inhibition can reduce dysmenorrhea. Additionally, progestogens block the synthesis of prostaglandins in the endometrium by reducing the endometrial thickness.

Menstrual migraine: Progestogens in continuous use reduce the intensity of menstrualmigraine.

Endometriosis: Progestogens can reduce the proliferative activity of the endometrium.

Extended-cycle contraceptives

The extended-cycle contraceptives (eg., COCPs, implants, transdermal patch, vaginal rings) are used to prevent pregnancy as well as monthly bleeding by providing a continuous supply of hormones. Seasonique and Seasonale are COCPs approved for a 91-day extended cycle. The extended-cycle contraceptives are intended for women who want to avoid monthlybleeding because of travel, sports, vacations, parties, honeymoon, busy schedule, and so forth.Extended-cycle contraceptive regimens decrease the hormone-free period and reduce the scheduled bleeding episodes, as well as withdrawal symptoms such menstrual pain, headache, breast tenderness, bloating, cramping, and hypermenorrhea.

Emergency contraceptives[9,10]

Most contraceptives are used before (eg, COCPs, implants, vaginal rings) or during (eg, condoms, diaphragms) intercourse. Emergency contraceptives (EMCs) are used after unprotected sex or when a contraceptive method has failed. Emergency contraceptives also are called “postcoital contraceptives” or “morning after pills.” Emergency contraceptives are used in cases of failed coitus interruptus, failed contraceptive methods (eg., diaphragm slipped out of place, breakage or misuse of condom during intercourse), sexual assault, consecutive missedcontraceptive pills, and when no other contraceptive has been used.

Table 2: Emergency contraceptives.

Si. No.	Method	Use within timeof unprotected intercourse	Dose andduration	Failure	Comments
1.	Levonorgestrel(lng)	72 hours	1.5 mg (oral)single dose	1%	Can be used upto 12 hourshowever less efficacy
2.	Oc pills	72 hours	2 tablets followed by another 2 Within 12hours	3%	-
3.	Mifepristone	72 hours	600 mg oralsingle dose	1%	-
4.	Ulipristal	12 hours	30 mg oral single dose	-	More effectivethan used b/w 72-12 hours

Emergency contraceptives act by preventing or delaying ovulation. Sometimes, if the egg is fertilized by sperm, EMCs may prevent its implantation in the uterus wall.Emergency contraceptives can be useful for the victims of sexual assault because undesired pregnancy can be avoided by taking the EMC pills within the recommended time period. Emergency contraceptive regimens recommend taking the pills as soon as possible within 3 to 5 days afterunprotected intercourse.

Other methods of contraception

Implants and Transdermal patches

Other medications are used as long- acting contraceptives. A subdermal system, the norplant implant, provides the synthetic progestin levonorgestrel as a long –term, reversible method of contraception. The six tiny capsules that are surgically implanted inside the upper arm contain the synthetic progestin and are the most effective form of contraception. The levonorgestrel diffuses slowly and continuously at the rate of about 80 mcg/day to provide contraception upto 5 years. The implant must be surgically removed when no longer desired oreffective.

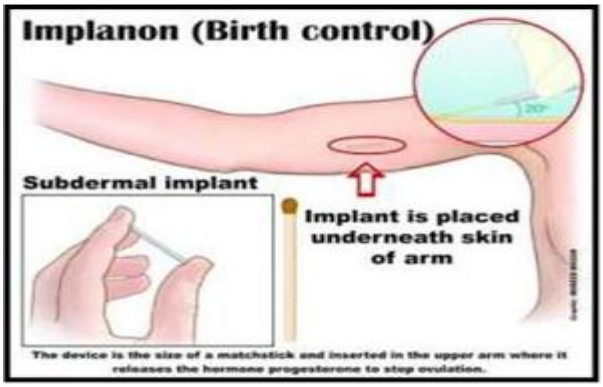

Fig.7: Implant.

A transdermal patch for contraception is a monophasic patch that holds a combination of ethinyl estradiol and norelgestromin to provide contraception much like oral preparations with the same indications and contraindications.

Fig. 8: Birth control patch.

Contraception by injection

A single injection of medroxyprogesterone (Depo - provera) provides contraception safelyand effectively for 3 months or more.

The injections prevent pregnancy in three ways: 1) by suppressing ovulation, 2) by thickening the cervical mucus, and 3) by altering the endometrium to discourage implantation of the fertilized ovum.

Copper intrauterine devices are widely used and highly effective (>99% at 1 year) for 5 years, and some for 10 years. They are especially useful in the over-40s, in whom oral contraceptives may become progressively contraindicated and for whom one IUD will last into the menopause. The IUD Prevents implantation of the fertilized ovum, and has an additional anti fertilisation effect enhanced by the toxic effect of copper ions on the gametes.

Fig. 9: Intrauterine devices.

The intrauterine devices

Intrauterine devices, another relatively long term effective reversible form of birth control, are inserted using minor surgical procedures. Two IUDS are available: the copper T 380A (Paragard) IUD and the intrauterine progesterone contraceptive system (progestasert).

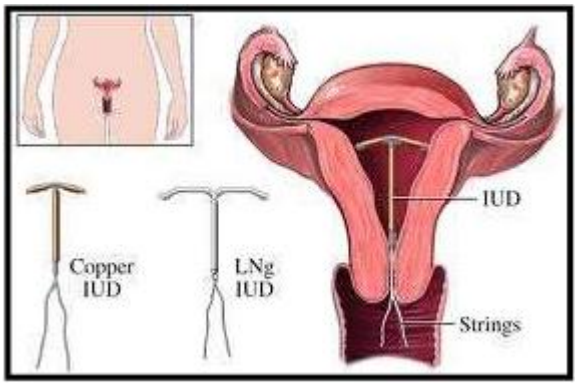

Fig. 10: Copper IUD.

Intrauterine levonorgestrel system: Mirena is used as a contraceptive, as a medical treatment for idiopathic menorrhagia and as the progestogen component of hormone replacement therapy. It is popular because of reduced dysmenorrhea and lighter menses. Mirena contains 52mg levonorgestrel surrounded by a silastic capsule, and releases 20 micrograms/day over 5 years, after which the device should be changed.

Vaginal preparations, used to immobilise or kill (spermicide) spermatozoa, are used to add safety to various mechanical contraceptives. They are very unreliable and should be used aloneonly in an emergency. substances used include non- oxinols (surfactants that alter the permeability of the sperm lipoprotein membrane) as pessary, gel or foam.

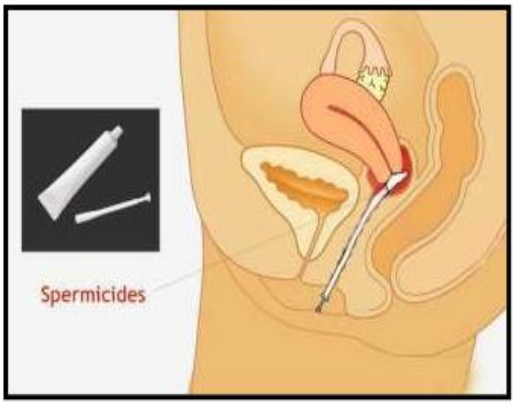

Fig. 11: Spermicides.

Oil-based lubricants cause failure of rubber condoms and contraceptive diaphragms; many 'lubricant',e.g. hand or baby creams, wash off readily, but are nevertheless oil-based. Barrier Contraceptive devices made of polyurethane, e.g. the female condom (femidom), are not so effected.

Non-contraceptive benefits of ocps[11]

- Oral contraceptives are used to treat signs of hyperandrogenism in women. The associated skin problems are

1. Acne vulgaris and comedonal acne
2. Hirsutism
3. Seborrhoea
4. Female pattern hair loss

- Reduction in endometrial cancer by 50% (when used for atleast 12 months, greatestbenefit with> 3 years use).
- Reduction in ovarian cancer by 40%, most notable after 3 years, use, but present after as little as 3-6 months of use.
- Reduction in benign breast disease.
- Reduction in blood loss, anemia , and dysmenorrhea.
- Protection against pelvic inflammatory disease.
- Decreased risk of ectopic pregnancy.
- Possible reduction in risk of colon cancer.
- Possible decrease in uterine leiomyoma.
- Possible protection against rheumatoid arthritis.
- Protection against osteoporosis.

Drug interactions

Pharmacological interactions between OCPs and other compounds may be of two types: drugs may impair the effectiveness of the OCPs or OCPs may interfere with the metabolism of other compounds. Interactions of the first kind are due to interference with the absorption, metabolism, or excretion of estrogen, and interactions of the second kind are due to competition for metabolic pathway.

a. **Drugs may impair the efficacy of OCPs:** Drugs such as anticonvulsants (phenobarbital, phenytoin, and carbamazepine) and rifampicin induce a

cytochrome P450, thereby increasingthe clearance of the OCPs.

Other antibiotics such as ampicillin, metronidazole, quinolones, and tetracycline, which reduce the bacterial flora of the gastrointestinal tract and increase enterohepatic recirculation, affect OC efficacy as a result of low bioavailability of EE.

Ascorbic acid and paracetamol give rise to increased blood concentrations of EE due to competition for sulfation , which can increase the risk of its side effects.

b. OCPs may interfere with the metabolism of other drugs: OCPs reduce the clearance of benzodiazepines (chlordiazepoxide, alprazolam, diazepam) and nitrazepam.The concentration of theophylline, prednisolone, caffeine, and cyclosporine is also reduced in OCP users. Thus, lower doses of these drugs may be effective in OCPs users.

The clearance of temazepam, salicylic acid, paracetamol, morphine, and clofibric acid apparently is increased. OCPs users may require larger doses of these drugs. Serum concentration of some of the antiepileptic drug (AEDs) such as lamotrigine may vary during the cycle when OCPs are being used. Lamotrigine level decreases almost by 50% when on thepill resulting in poor seizure control. During 'pill-free' interval, the level may increase causing lamotrigine toxicities such as dizziness, double vision, and lack of coordination; therefore, the dose should be decreased during the pill-free period.

For women taking antiretroviral drugs that have significant pharmacokinetic interactions with hormonal contraceptives, an alternative or additional effective contraceptivemethod to prevent unintended pregnancy is recommended. Several ritonavir-boosted protease inhibitors (PIs/r), efavirenz (EFV), and elvitegravir/cobicistat (EVG/c) based regimens have drug interactions with COCP. These drugs decrease or increase the blood levels of EE, norethindrone, or norgestimate, which potentially decreases contraceptive efficacy or increases estrogen or progestin-related adverse effects (e.g., thromboembolism). EFV can decrease etonogestrel bioavailability and plasma progestin concentrations of COCP containing EE and norgestimate. Several PI/r and EVG/c decrease OC estradiol levels.Several pharmacokinetic studies have shown that etravirine, rilpivirine, and nevirapine use did not significantly affect estradiol or progestin levels in women with HIV using COCP.

Adverse effect of oral contraceptives[12]

This has led to the development of the current low-dose preparations, because the current consensus is that low-dose preparations pose minimal health risks in women who have no predisposing factors. The earlier oral contraceptives produced adverse cardiovascular effects like hypertension, myocardial infarction, stroke and venous thrombosis and embolism, and cancer of cervix, liver and breast and a number of endocrine and metabolic effects. The low- dose preparation of oral contraceptives has a minimal incidence of such adverse effects.

Thromboembolism

There is an increased risk of deep vein thrombosis, cerebral thrombosis, and pulmonary Embolism. The risk is related to the concentration of estrogen component. The low dose Pills reduce this risk. The pill is contraindicated in patients with thrombophlebitis, thromboembolic disorders and cerebral apoplexy or with a past history of these conditions theappearance of any of the conditions such as vascular headaches, leg cramps, visual disturbances or hypertension is an indication for permanent discontinuation of the pill.

Hypertension

It occurs in about 5% of users after 5 years and is related to the length of usage. Blood pressurecondition elevation is mild and is reversible on stoppage of the pill. It is probably due to the estrogen-induced increase in angiotensinogen.

Liver and Gall bladder

Increase in plasma conjugated bilirubin and alkaline phosphatase occurs in upto 2% of patients.both estrogens and progestogens may be involved if a woman develops acute Hepatitis, the drug should be stopped and should be resumed only after the liver function tests have been normal for atleast six months. gall stones occur about twice as commonly in women using thepill.

Carcinogenicity

The major concern is about the carcinogenic effects of oral contraceptives, in particular breast cancer. The risk of breast cancer in women of childbearing age is very low with the current oral contraceptives containing low dose estrogens.

Bleeding irregularities

Sometimes bleeding, similar to normal bleeding (break-through bleeding), occurs in some women. It is due to failure of synthetic hormones to maintain the endometrium. In such cases,the tablets are stopped and a new course started five days later with a preparation containing large quantity of progestogen.

Periodontal effects[3]

The use of COCs can influence the periodontal conditions of patients, resulting in increased gingival disease. This adverse effect can be enhanced by the use of newer generations of OCPs that lack the possible protective effect of the androgenic properties of older OCPs, especiallyin high‑risk populations.

Other toxic effects

Nausea and vomiting may occur with the first dose of the

pill, but may subside with continued use. The effects are due to the estrogen component. The drug should be taken at bedtime, on a full stomach to minimize them.

The estrogen content may be responsible for fluid retention and weight gain, breastengorgement, mastalgia and leucorrhea (increased vaginal secretion). Migraine may be precipitated or aggravated. depression may be more common in pill users and is more likely tooccur in women with previous history of depression or premenstrual tension syndrome. The pill may increases the frequency of fits, particularly if these have been related to premenstrual tension, and some patients develop epilepsy for the first time on the pill.

Ormeloxifene (Centchroman)[5]

It is a non-steroidal SERM developed at CDRI India as an oral contraceptive. It has predominant estrogen antagonistic action in uterus and breast with little action on vaginal epithelium and cervical mucus. Endometrial proliferation is suppressed by down regulation of endometrial ER. Contraceptive action is probably due to utero-embyonic asynchrony and failure of implantation.Pituitary, ovarian and other endocrine functions remain practically unaffected. Menstrual cycle is not distrupted, but in some women it may be lengthened irregularly. Excessive bleeding attending anovulatory cycles (that generally occurs near menopause) is diminished; ormeloxifene is approved for use in dysfunctional uterine bleeding. The plasma t1/2 of ormeloxifene is long (~1 week).It prevents conception as long as taken with return of fertility few months after stoppage. Failure rate is considerd acceptable, but it has failed to gain popularity for widespread use. Side effects are nausea, headache, fluid retention, weight gain, rise in BP and prolongation of menstrual cycles.

Centchroman has the following

Advantages

1. Success ratte claimed is 97-99%.
2. No teratogenicity, carcinogenicity or mutagenicity reported.
3. It is well tolerated.

Disadvantages

1. It may cause ovarian enlargement and should be avoided in polycystic ovaries.
2. It should also be avooided in renal and hepatic dysfunction, tuberculosis and in lactatingmothers.

Use and Packaging

Half-used blister pack of LevlenED Combined oral contraceptive pills should be taken atthe same time each day. If one or more tablets are forgotten for more than 12 hours, contraceptive protection will be reduced. Most brands of combined pills are packaged in one of two different packet sizes, with days marked off for a 28 day cycle. For the 21-pill packet, apill is consumed daily for three weeks, followed by a week of no pills. For the 28-pill packet, 21 pills are taken, followed by week of placebo or sugar pills.. There are also two newer combination birth control pills (Yaz 28 and Loestrin 24 Fe) that have 24 days of active hormonepills, followed by 4 days of placebo.

Figure 12: Use and Packaging of oral contraceptive pills.

Storage of contraceptive pills

Contraceptive pills should be stored in a dry and cool place. They do not need to be refrigerated. Also, they should be stored properly to avoid accidents of mistaken consumptionby children.

Guidelines[2]

In 2000, the American College of Obstetricians and Gynecologists (ACOG) issued practice guidelines regarding hormonal contraception. Also in 2000, the World Health Organization (WHO) published guidelines on medical eligibility for contraceptive use. The two sets of guidelines are similar.

Recent trends in oral contraceptive pills[13]

A contraceptive pill that needs to be taken only once a month has been developed by scientists. The gelatine capsule, which has so far only been tested on pigs, dissolves in the stomach to a release a six-armed star-shaped polymer structure that sits in the stomach for at least three weeks and releases synthetic hormones to prevent pregnancy. Scientists say it couldhelp to prevent

unplanned pregnancies caused by errors in daily pill use.

CONCLUSIONS

Oral contraceptive pills are among the preferred contraceptive methods because they are easy to take, there is no pleasure interruption, no surgical procedure is required, there is no device- related discomfort, they can be discontinued easily if the couple is planning for pregnancy, and the method is highly effective when taken properly according to the regimen. Success of OCPs is almost 99% when taken regularly according to recommended regimens.

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