


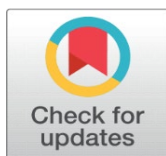
A REVIEW STUDY ON ROLE OF CONTRACEPTIVES AND THEIR VARIOUS TYPES

Deeksha ¹, Ompi Kumari ², Soumya Bharadwaj ³

¹ Assistant Professor, Quantum University, Roorkee, India

² Assistant Professor in Motherhood University, Roorkee, India

³ Roorkee college of pharmacy, Roorkee, India



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Corresponding Author

Deeksha, shailytyagi664@gmail.com

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ABSTRACT

Contraception is the process used to stop unwanted pregnancy and control birth rate. Contraceptives reduces the chances of pregnancy after sexual intercourse. Contraceptives prevent pregnancies by interfering with the procedure of fertilization. Contraceptives reduces the chances of abortion by preventing unintended pregnancies on their partners, in which 842 million (44%) are modern using modern methods of Contraceptives are accessible in huge varieties and types. Numerous contraceptives are available, 790 million (42%) are traditional method users according the statistical data of 2019. The most common contraceptive techniques that are use of contraceptives are increasing day by day, 922 million of women of reproductive age used worldwide are female sterilization and male condoms, female sterilization are used in 219 million users (24%), male condoms are used in 189 million users (21%) according the data of 2019. The use of traditional methods and IUDs has reduced worldwide since 1994. According to WHO, The only form of birth control is a condom, that can prevent both unintended pregnancies and sexually transmitted diseases. The need of family planning is increased globally up to 77% from 2015 to 2020. Over the past 20 years, the number of women using family planning methods has grown, rising from 900 million in 2020 to 2000 million. Use of modern contraceptive methods is also increased from 663 million to 851 million with the prevalence rate of 47.7% to 49.0%. Numerous contraceptive methods exist, including hormonal methods like CHC vaginal ring, CHC transdermal patch, and combination hormonal contraceptives. Progestin-only techniques include hormonal male contraceptives, progestin-only pills, DMPA injections, implants, and progestin-only IUDs. The other approach is non-hormonal and consists of vaginal pH modulators, barrier techniques like condoms, and copper IUDs. Traditional methods, such as the LAM method, the fertile cycle method, and the withdrawal approach, comprise the third type of contraception. Herbal contraceptives, which use a variety of herbs and plant preparations, are the fourth technique of birth control.

Keywords: CHC Vaginal Ring, CHC Transdermal Patch, LAM Method

1. INTRODUCTION

Contraception is the process that is used to prevent unwanted pregnancy and control birth rate. Contraceptives reduces the chances of pregnancy after sexual intercourse. Contraceptives prevent pregnancy by interfering with the technique of fertilization. Contraceptives such as condoms reduce the danger of infections spread through sexual contact. Contraceptives reduces the chances of abortion by preventing unintended pregnancies on their partners, in which 842 million (44%) are modern using modern methods of Contraceptives are available in huge varieties

and types. There are numerous people who utilise contraception; according to 2019 statistics, 790 million people (42%) use the traditional technique. The most common contraceptive steps that are Use of contraceptives are increasing day by day, 922 million of women of reproductive age used worldwide are female sterilization and male condoms, female sterilization are used in 219 million users (24%), male condoms are used in 189 million users (21%) according the data of 2019. Since 1994, the use of IUDs and conventional techniques has decreased globally. The only method of contraception that can prevent both, according to WHO, is the condom unintended pregnancies and sexually transmitted diseases. The need of family planning is increased globally upto 77% from 2015 to 2020. The number of use of family planning methods is increased among women over the past two decades from 900 million to 2000 million in 2020. Use of modern contraceptive methods is also increased from 663 million to 851 million with the prevalence rate of 47.7% to 49.0%. [Deborah et al. \(2023\)](#)

2. HORMONAL CONTRACEPTIVES

2.1. HORMONAL CONTRACEPTIVES COMBINED

It includes the combination of artificial estrogen and progestins. It has a lower failure rate than 1% with the proper prescribed use and 7% to 9% with typical unprescribed use. These are most often prescribed by medical practitioner. Progestin prevent the release of eggs from ovaries by inhibiting LH surge, results in suppressed ovulation. They thickens the cervical mucus and makes the endometrium atrophic. Estrogen suppress FSH production, results in inhibition of development of dominant follicle. CHCs are basically taken for three weeks. Three weeks later, withdrawal bleeding occurs, which could indicate that the user is not pregnant.

A shorter menstrual cycle, a 40%–50% decrease in menstrual flow, nausea, breast soreness, headaches, mental stress, irregular bleeding, and a decrease in PMS are common side effects of CHCs.

Common contraindications of CHCs include age of 35 years or older, smoking, high blood pressure, having major surgeries, migraine, suffering from deep vein thrombosis and pulmonary embolism.

CHCs pills: These conveniently accessible pills contain a generation of progestins along with a combinational salt of 10 to 35 mcg ethinyl estradiol. These pills should be taken at the same time every day; if a dose is missed, the user should take it as soon as they remember. Missing a dose for longer than 48 hours will not guarantee ovulation suppression; in fact, skipping a dose will reduce the pill's effectiveness. To avoid getting pregnant, utilise the backup method of contraception for seven days if the dose is missed. [Dey et al. \(2021\)](#)

Major disadvantages of hormonal pills:

- It offers no defence against diseases spread by sex.
- Doses must not be skipped.
- Irregular bleeding, low menstrual flow.
- Women with high BP cannot take these pills.
- These pills can often cause cycle irregularities.

CHC transdermal patch: It is a small, two-inch square that has 150 mcg of norelgestromin and 35 mcg of ethinyl estradiol combined in it. It can be applied anywhere, such as the buttocks, arms, or stomach, and for best effects, it should be

fully adhered to the skin. Every week for a maximum of three weeks, it is changed after being used for three weeks.

Major disadvantages:

- It offers no defence against diseases spread by sex.
- Irregular bleeding
- It can cause reactions and side effects like headaches, nausea etc.
- Can skin reactions like irritation.

CHC vaginal ring: it is the transparent ring and is flexible in nature, it is of 2 inches. It is placed inside the vagina for 21 days. It is withdrawn from the vagina for 7 days for the withdrawal bleeding. It releases 15 mcg of ethinyl estradiol per day and 120 mcg of etonogestrel per day for 21 days, it is changed every month. Vaginal ring can be placed by users themselves inside the vagina. The vaginal ring can be removed for three hours, but user should wash the ring with lukewarm water before placing inside vagina. If the ring is removed accidentally then it increases the chances of pregnancy.

Major disadvantages:

- It does not protect against sexually transmitted diseases.
- It causes more painful menstrual blood flow.
- These cannot be at the time of breast feeding.

Effects of oral contraceptives on mental health and mood

Estrogen and progesterone both produces negative effect on mood of individual user. They can cause depression and negative thinking buildup, and It is thought to be the most typical cause for women to stop taking these medications. The mechanism of action of depression and negative thinking caused by oral contraceptives is still unknown. New salts like estradiol have less influence on the mood of users. Users of medroxyprogesterone acetate injection have much more emerging symptoms of depression. The symptoms of depression in oral contraceptive users may be depends upon the type and amount of progesterone present in the contraceptives.

Effects with continuous use of oral contraceptives

- **Bleeding profile:** the bleeding in menstrual cycle decreases because of the inactive endometrium layer caused by the continuous use of oral contraceptives. Spotting and irregular bleeding can also be observed. Oral contraception continuous use is the efficacious way to decrease the menstrual flow during the year.
- **Symptoms related to menstrual cycle:** the symptoms produce at this can affect the quality of life women. The hormonal symptoms gets worse during the hormone free time interval of oral contraception. Studies suggests that women who continuously use oral contraceptive reduced their pelvic pain comparative to non users.
- **Contraceptive effect:** they prevent pregnancies. Their major three principles are inhibition of ovulation, secretion of thick cervical mucus and inhibition of endometrium development. The continuous users have better contraceptive effect due to production of smaller follicle because of the continuous use of oral contraceptives.
- **Fertility:** the fertility rate increases day by day after the discontinuation of oral contraceptives, the study suggests that 34 women discontinued the use of oral contraceptives to get pregnant, their pregnancy rate was 57% after

three months of discontinuation and 81% after 12 months of discontinuation.

- **Pulmonary embolism and arterial complication:** the risk of myocardial infraction, pulmonary embolism, arterial complication is less compared to continuous users of oral contraceptives. The risk of these diseases is reduced in oral contraceptive users by lowering the doses of contraceptives with less than 50 mcg ethinylestradiol.
- **Effect on sleep:** Users of hormonal contraceptives (women) have the rate of sleep disturbance up to 6%.

Progestin only methods

These pills contains only progestin without the combination of estrogen. These pills require prescription before use and before purchasing. Progestin only methods includes pills, implants, injections, IUDs.

Progestin only pills (POPs): They have a lower dosage than CHCs and are manufactured from the salts of first-generation progestins. POPs are recommended to users at the same time every day. Unlike CHCs, they are used on a regular basis and do not have a hormone-free phase. When used as directed, their failure rate is less than 1%, but when used as not intended, it is 7%. POPs are referred to as safer when CHCs are not recommended. Because the drug amount in the bloodstream is only maintained for 22 hours, POPs are administered at the same time every day. Regular dosing is therefore necessary for the correct maintenance of the drug level in the bloodstream. [Pandey et al. \(2009\)](#).

DMPA injection: Depo-Provera is the combinational salt of 150 mg per mL IM (intramuscular) injection or a salt of 104 mg per mL subcutaneous injection. These injections are injected in every 12 to 13 weeks. Their failure rate is less than 1% with perfect use and less than 4% with the imperfect use. They suppress ovulation by inhibiting gonadotropin releasing hormone. It has more side effects than CHCs and POPs.

Implants: They go by the name "long acting reversible contraceptives" as well. They have progestin that is hormone-free. Only licenced and skilled nurses and midwives, or experienced medical professionals, should do these insertions and extractions. Matchstick-sized implants are inserted into the upper arm and left there for three years. The single salt of 68 mg etonogestrel is included in the implant. By the end of the previous year, the 68 mc etonogestrel salt emissions had decreased from a daily rate of 60 to 70 mc to a daily rate of 25 to 30 mg. When used properly, its failure rates are fewer than 1%.

IUDs with progestin: They are also termed as intrauterine devices. Their failure rate is less than 1% with the perfect use. They are placed at the cervical canal. They can be inserted within the first 5 days of unprotected intercourse. IUDs are inserted with the help of experienced medical practitioner, experienced nurses or experienced midwives only. Contraindications of IUDs includes gonorrhea, cervicitis, inflammation of pelvic region. If inflammation develops at pelvic region, then it is cured with the course of antibiotics, or the IUD is removed if the inflammatory disease is not treated with antibiotics.

Male hormonal contraception

Their effectiveness and knowledge is increasing day by day. Its main mechanism of action is suppression of testosterone production and results in inhibition of sperm production. 17-methyl-testosterone have better bioavailability, but its major side effect is hepatotoxicity when used in long term. A

synthetic androgen named 7-alpha-methyl-19-nortestoesterone is currently being studied as a possible new male contraceptive with better activity.

3. NON-HORMONAL METHODS

These techniques consist of the barrier methods, copper IUD. Non hormonal methods does not have many side effects, they just include few side effects. These methods do not contain synthetic hormone, so they do not interfere with body exogenous processes. Non hormonal methods like condoms also prevent STDs (sexually transmitted disease).

Copper IUDs: These can be used perfectly or imperfectly, and their failure rate is less than 1%. These are the most efficacious non hormonal contraceptive method. The device should be inserted with the help of experienced medical practitioner, experienced nurses or experienced midwives only. The IUD device can be used up to 10 years. Copper IUDs are spermicidal, they kills sperms entering the cervical canal, thus prevents pregnancy.

Barrier methods: They are exclusively utilised during sexual activity. These include male, female condoms and diaphragms. They have high success rate. These are most common method used by people. These are available in huge varieties according to users requirements.

As over-the-counter measurements, condoms are utilised. Condoms are basically manufactured from latex, polyurethane, polyisoprene, and for users who are allergic to latex the condoms are manufactured from lambskin.

Diaphragms are used in conjunction with spermicides to boost their efficacy by blocking the cervical entrance inside the vagina. They are available in large varieties of sizes according the requirement of users.

Vaginal pH modulators

They are administered though vagina. These are in the form of gels, they include different buffering agents like citric acid, lactic acid, potassium bicarbonate, humectants, purified water and gelling agents. Women vaginal pH ranges from 3.5 to 4.5 hence the pH is acidic inside the vagina and sperm is alkaline having the pH ranges from 7.2 to 8.0. The vaginal pH modulators maintain the acidic pH of vagina even in the presence of sperm which reduces the sperm mobility inside the vagina and act as spermicides, it also creates a barrier at the cervix due to its high viscosity which inhibit entry of sperm inside the cervix.

Burning, itching, infections, and soreness inside the vagina are among its main negative effects. [Roberto et al. \(1999\)](#)

4. CLASSICAL METHODS

This type of methods are in use from the decades. These are the oldest methods of contraception. They are still in use. These methods include withdrawal method or the pulling out method, lactation period method (LAM), fertility cycle method (FABMs).

The withdrawal method, which involves the ejaculating partner exercising great control, excellent communication, and mutual agreement, involves pulling the penis out of the vagina prior to ejaculation. Due to its high failure rate (20% with imperfect use and 4% with perfect use), very few people adopt this procedure.

LAM is performed when the women is breastfeeding the infant under 6 months. It depends on the LH surge. The LH level increases during the breast feeding time, it decreases the chances of pregnancy. it is applicable only if the infant is under 6 months. After the infant get older above 6 months its success rate drops.

The unprotected sex during the infertile window is part of the fertility cycle approach. The window is established using a variety of data. 15% of it fails when used improperly, and 0.4% to 5% when used correctly. [Pande et al. \(2009\)](#).

5. HERBAL CONTRACEPTIVES

Since ancient times, people have utilised plants to ease their suffering. Plants and human bodies are more compatible. 80% of the plant species are used for medicinal purpose for human being. Herbal preparations are used in the reproductive health majorly in suppressing the fertility in both males and females. They are the best alternatives for peoples having health issues. Herbal contraceptive are the preparation that are manufactured by plant products only and they are to prevent unintended pregnancies. All herbal contraceptives have different mechanism of actions, they requires time to achieve their desired effect until then a barrier method should be used temporarily. [Malmberg et al. \(2020\)](#)

Herbal contraceptives frequently lag behind contemporary contraceptives since there is very little public awareness of them, people assume they are ineffective, and information about them is primarily from ancient cultures.

Table 1

Table 1 Common Plants with their Contraceptive Activity						
A. Effects on Female Side:						
Sl. No	Action	Botanical name	Common name	Family	Parts used	References
1	Implantation Preventer	<i>Adhatoda vasica</i>	Aduss, Arusa	Acanthaceae	Leaves	6
		<i>Alium cepa</i>	Onion	Liliaceae	Bulb	6
		<i>Cassia fistula</i>	Amaltas Ratti, Gunchi,	Caesalpiniaceae	Pods, Seeds	10,2
2	Abortification	<i>Abrus precatorius</i>	Gunja	Fabaceae	Seeds	10, 5, 2, 9, 7
		<i>Jatropha curcas</i>	Jamal ghot, Ratanjot	Euphorbiaceae.	Fruits	3
		<i>Plantago ovata.</i>	Isabgol	Plantaginaceae	Seeds	10,2
3	Contraception	<i>Bacopa monnieri</i>	Brahmi	Scrophulariaceae E	Plant	10
		<i>Aegel marmelos</i>	Bel	Rutaceae	Leaf	10,2,9
		<i>Piper nigrum</i>	Black pepper	Piperaceae	Fruit powder	3
4	Antioestrogenic	<i>Acalypha indica</i>	Kuppi, Kuppikhokh ali	Euphorbiaceae	Whole plant	5,2
		<i>Croton roxburghii</i>	Banmirchi	Euphorbiaceae	Bark	10

		<i>Nelumbo nucifera</i>	Lotus	Nymphiaceae	Seeds	6,11
5	Antiovolatory	<i>Aspilia Africana</i>	Haemorrhage plant	Asteraceae	Leaves	10
		<i>Butea monosperma</i>	Palas	Papilionaceae	Seeds	1,12,8,7
		<i>Ficus religiosa</i>	Peepal	Mosaceae	Seeds	6
B. Effects on Male Side:						
		<i>Aloe vera</i>	Ghritakumari	Liliaceae	Latex	11
1	Spermicidal	<i>Clerodendrum serratum</i>	Babhneti, Bharangi	Verbenaceae	Whole plant except root	6
		<i>Terminillia bellirica</i>	Bahera, Bahuvirya	Combretaceae	Fruits	3,2
		<i>Tinospora cordifolia</i>	Amrita, Giloy, Guduchi	Menispermaceae		
2	Reduce sperm count & sperm motility	<i>Ocimum sanctum</i>	Tulsi, Ocimum	Labiatae	Leaves	10,2
		<i>Lobelia inflata</i>	Pokeweed, Indian tobacco	Lobeliaceae	Stem	7
3	Inhibit spermatogenesis	<i>Lawsonia intermis</i>	Henna, Mehandi	Lythraceae	Flower	2
		<i>Hibiscus rosa-sinensis</i>	China rose	Malvaceae	Flower	3
		<i>Randia dumetorum</i>	Mainaphal	Rubiaceae	Fruit	10,12

CONFLICT OF INTERESTS

None.

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