

## Overview on the Different Hormonal Contraception Methods: A Review Article

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### Abstract

Hormonal contraceptives contain artificially produced hormones that are almost identical in their effect to the endogenous hormones: estrogen and progestin. These hormones are responsible for controlling the monthly cycle. The best known and most widely used hormonal contraceptive is the combined pills, and the form of a micro-pill, a low-dose estrogen-progestin. The combined pills are a mixture of estrogen and progesterone are taken orally, i.e., in tablet form. Other options for hormonal contraception are the hormonal IUD's, vaginal ring, contraceptive implants, injections and patches.

**Keywords:** Contraception, Hormonal, Combined Contraception Pills, Mini Pills, IUD

### Combined Contraceptive Pills

The pill is still one of the safest contraceptives and is the most frequently used method of preventing pregnancy. There are different types of pills - from different manufacturers and in different dosages. Girls and young women in particular often prefer the pill. The pill is one of the very safe contraceptives (1). The prerequisite is daily intake at the same time of day, with the exception of the pill break.

Most pill preparations are combination pills that contain estrogens and progestins (2). These hormones:

- Suppress ovulation. As a result, the woman's entire cycle consists of sterile days. That means, no fertilization.
- Change the cervical mucus in the cervical canal. This becomes thicker and more viscous. This prevents the sperm from entering the uterus.
- Prevent the monthly build-up of the uterine lining.

There are different types of pills - from different manufacturers and in different dosages. However, they all contain estrogen and progestin (combination pills)

When taking the pill for the first time, it is taken on the first day of the menstrual period. It protects from day one. A distinction is made between single-phase pills and two- and three-phase pills.

#### Single phase pill:

With this type of pill, each tablet contains the same amount of estrogen and progestin. It is taken daily - usually 21 days. Thereafter, the intake is interrupted for seven days. During this time, it usually comes to withdrawal bleeding (3). Even during this break, there is protection from pregnancy. On the eighth day, the first pill of a new pack is started, even if the withdrawal bleeding continues.

There are also single-phase pills that are taken without breaks, although some pills, depending on the preparation, no longer contain any active ingredients. They serve to avoid mistakes in taking. The withdrawal bleeding usually occurs while taking the ineffective pills.

#### Two- and three-phase pill:

These pill preparations have a different composition of estrogen and progestin in one pill pack for the first and second half of the cycle. Here the intake is exactly prescribed, i.e., the pills must be taken in the correct order so that they can work safely.

The pill is taken every day at the same time of day - with the exception of the pill break (4). For example, in the morning after breakfast or in the evening after eating. So that the pill is not forgotten, it is advisable to make taking it a ritual - like brushing your teeth every day.

The pill is one of the very safe contraceptives. Reliability problems can occur in the following cases :

- Taking the pill with other medication: Some medications (e.g., antibiotics, laxatives) can partially or completely cancel the effect of the pill. Inquire with your doctor or at the pharmacy whether a medicine can affect the way the pill works.
- Gastric and intestinal problems: With diarrhea or vomiting, the active ingredient in the pill may be excreted before it has been absorbed into the blood. This can impair the effect. Additional contraception should be used for at least a week if the symptoms are prolonged.
- Vacation trips with a time difference: When traveling with a time difference, taking the pill should be discussed with your gynecologist.

If a tablet is forgotten, the pill is still reliable if the forgotten pill is taken within twelve hours. The following pills are taken again at the usual time of day without a “time difference”. If the pill is forgotten several times in a row, additional contraceptive protection must be used until the next bleeding occurs - e.g., Condoms - be used (5).

The pill is one of the medicines. In addition to the desired effect, any drug can also have undesirable side effects. The pill is a highly effective drug and not suitable for every woman. Therefore, the pill requires a prescription. The right pill preparation can only be selected individually after a detailed discussion with the gynecologist.

#### The advantages:

- When taken regularly, the pill offers almost one hundred percent protection.
- The pill is effective immediately from the first day of use.
- Weaker and shorter menstrual bleeding: The amount and duration of bleeding usually decrease when you take the pill.
- Relief of menstrual cramps: Menstrual pain can usually be relieved by taking pills.
- Positive effects on the complexion: Skin imperfections (e.g., puberty acne) are usually caused by an increased level of male sex hormones. Taking the female sex hormones with the pill often improves the complexion significantly.
- Good cycle control: By taking the pill, you know exactly when your menstrual period starts.
- Fertility: The pill does not affect fertility. Even after many years of use, most women get pregnant quickly after stopping the pill.

#### The disadvantages:

- The pill does not protect against sexually transmitted infections.
- The pill must be taken every day and at the same time of day.
- The pill is not free of side effects. Side effects include: nausea and vomiting, weight gain, sexual desire, irregular bleeding, tenderness in the breasts.
- The combination pill must not be taken during breastfeeding, as the baby would absorb too large number of hormones through breast milk. The estrogen effect can also stop the flow of milk.
- The pill should only be taken by healthy women, as it can also affect the heart and circulation.

- The female sex hormone estrogen contained in the combination pill can change blood pressure and blood clotting. The pill is not suitable for women at risk of thrombosis or embolism.
- In women who suffer from diabetes, the intake must be checked individually.
- Pills and smoking cause blood vessels to constrict. Smokers are not advised to take the pill.

### **Mini-Pills**

In contrast to the "classic" combined birth control pill, the mini pill only contains the luteal hormone progesterin. Therefore, the minipill can also be taken while breastfeeding. Like the combined pills, it requires a prescription. These preparations thicken the mucus in the cervix and at the same time suppress ovulation (inhibit ovulation). The minipill with the active ingredient levonorgestrel must be taken daily and at the same time - without interruption (6). If the intake is delayed by more than three hours, protection against pregnancy is no longer given. In this case, an additional contraceptive (e.g., Condoms) to use.

The reliability of the minipill with levonorgestrel is lower than that of the combination pill. The mini pill with desogestrel works through inhibiting the ovulation and is therefore just as safe as the combination pill. This is achieved through a higher dose of the progesterin. Daily consumption is a prerequisite for reliability (7).

The minipill is one of the hormonal contraceptives and is especially useful during Breastfeeding a popular method of contraception.

#### The advantages

- The minipill is effective immediately from the first day of use.
- The mini pill has fewer side effects than the combination pill. It is particularly suitable for women who cannot tolerate estrogens.
- The minipill can also be taken while breastfeeding: With the combination pill, the baby would absorb too large number of hormones through breast milk, and the flow of estrogen could stop the flow of milk.
- Fertility: The mini pill does not affect fertility. Even after many years of use, most women get pregnant quickly after stopping the minipill.

#### The disadvantages

- The mini pill does not protect against sexually transmitted infections.
- The minipill must be taken daily and at the same time of day: The levonorgestrel-containing minipill in particular requires a high level of discipline when taking it.
- The mini pill is not as safe as the birth control pill.
- More frequent intermenstrual bleeding is possible with the minipill.
- Taking the minipill can cause cycle irregularities (8).

### **The Three-month Injection**

The three-month injection is a hormonal contraceptive and must be re-administered every three months. The three-month injection contains a high-dose, long-acting progesterin (luteal hormone). The three-month injection prevents ovulation on the one hand. On the other hand, the progesterin causes a change in the uterine lining. This prevents the sperm from entering the uterus. The gynecologist injects the preparation into the gluteal muscle or upper arm in the first five days after the start of menstruation. This process must be repeated every three months (twelve weeks) (9).

The three-month injection is considered a very safe method of contraception. The simultaneous use of other drugs with the three-month injection should be carried out in consultation with the gynecologist (10).

The three-month injection is a long-term injection that works due to the high dose of the luteal hormone progesterin.

#### The advantages:

- Long-term effect: The three-month syringe only needs to be injected quarterly (every three months).
- The three-month injection is administered by the gynecologist. There can therefore be no application errors.
- The three-month injection can also be used during the Breastfeeding.
- Gastrointestinal complaints do not affect the reliability.

#### The disadvantages

- The three-month injection does not protect against sexually transmitted infections.

- Due to the three-month injection, the period can occur irregularly.
- Due to the high dose of hormones, bleeding between periods and spotting is possible.
- A rare side effect of the three-month injection is heavy bleeding.
- It takes a long time for the cycle to normalize and fertility to be restored after the last three-month injection.
- The three-month injection is not suitable for women with risk factors for osteoporosis: the three-month injection can lead to a reduction in mineral bone density due to the high dose of progestin.
- Due to the high progestin content, there may be intolerances such as headache, dizziness, depressions, acne and greater weight gain (11).

### **The Vaginal Ring**

The vaginal ring is a flexible plastic ring that releases the female sex hormones estrogen and progestin evenly into the blood. It works like the combination pill: the hormones are absorbed through the vagina and prevent monthly ovulation. The hormones change the monthly liquefaction of the mucus in the cervical canal. This prevents the sperm from entering the uterus (12).

The vaginal ring is flexible and is inserted into the vagina by the woman herself - as far as possible (similar to a tampon). It doesn't matter exactly where the ring is for safety. It is important that it is comfortable and not noticeable to the woman (13). When using for the first time, the vaginal ring should be inserted between the first and fifth day of menstruation. In the first cycle of use, additional contraceptive protection should be used for the first seven days (e.g., Condoms).

The vaginal ring can be used lying down or standing. The ring will remain in the vagina for a period of three weeks. It is then removed by the woman herself, followed by a one-week break (seven days) during which she will bleed. A new ring is inserted after a week - even if the bleeding has not stopped. The vaginal ring should always be used on the same day of the week (14).

The vaginal ring (also called the contraceptive ring) is an alternative to the birth control pills and suitable for all women who do not want to think about contraception every day.

#### Advantages:

- The vaginal ring only needs to be used once a month.
- Diarrhea and vomiting do not affect the functioning of the vaginal ring.
- The vaginal ring is also easy to use when traveling long-distance.
- The hormones in the vaginal ring are dosed lower than in the pill or hormone implant.
- Good cycle control: By changing the vaginal ring, you know pretty much exactly when your menstrual period starts.
- Weaker and shorter menstrual bleeding: The amount and duration of bleeding usually decrease when the vaginal ring is used.

#### Disadvantage:

- The vaginal ring does not protect against sexually transmitted infections.
- Possible side effects of the vaginal ring are, for example headache, Vaginal infections, Vaginal discharge, acne, Nausea, breast tenderness.
- The vaginal ring allows more painful menstrual bleeding.
- The vaginal ring cannot be used while breastfeeding as the baby would absorb too much hormone through breast milk. The estrogen effect can also stop the flow of milk (15).

### **The Hormonal IUD**

The hormone coil is an elastic, T-shaped plastic body. It combines the effectiveness of two tried and tested contraceptive methods: the mini pill and the copper IUD (16). The hormone coil is provided with a small hormone cylinder that continuously releases a small amount of progestin directly into the uterus - which only enters the bloodstream in very small amounts, as is the case with the pill, for example. Therefore, the hormonal release of the IUD is significantly lower than with all other hormonal contraceptives.

The IUD works by thickening the mucus in the cervical canal. This prevents the sperm from entering the uterus and suppresses the growth of the uterine lining. The IUD offers reliable and effective contraception for three or five years (depending on the product) (17).

The hormone coil is inserted into the uterus by the gynecologist using a special insertion tube during the menstrual period (18). The onset of the hormonal IUD only takes a short time, but it can be accompanied by slight, cramp-like pain in the abdomen. The correct position of the coil in the uterus is determined by means of Ultrasonic-checked. After about one to two months, the gynecologist will check whether the T-shaped plastic body is properly seated.

A so-called retrieval thread is attached to the end of the hormone cylinder, which makes it easier for the doctor to remove the IUD.

#### The advantages:

- Weaker and shorter menstrual periods: The amount and duration of bleeding usually decrease.
- Relief from menstrual cramps: Menstrual pain (e.g., abdominal cramps) can often be relieved.
- The hormone release is lower than with conventional hormonal contraceptives. Therefore, hormone-related side effects are very rare.
- The IUD can also be used during breastfeeding.

#### The disadvantages:

- The IUD does not protect against sexually transmitted infections.
- Side effects such as headache, acne or depressive moods.
- Spotting and intermenstrual bleeding are possible due to the hormonal coil.
- The hormonal IUD is thicker than the copper IUD: women who have not yet given birth may need to stretch the cervix (19).

### **The Hormonal Implants**

The hormone implant is a soft plastic stick. It is about 4 cm long and 2 mm thin. The stick itself is made of a plastic that does not dissolve in the body and does not contain silicone. It protects against unwanted pregnancy for a period of three years. The hormone implant is one of the most modern methods of contraception. It offers well-tolerated long-term protection and can be reversed at any time (20).

The hormone implant contains the corpus luteum hormone (Progestin) that is released into the body in small amounts. This will prevent ovulation at the same time change the mucus in the cervical canal, which prevent the sperm from entering the uterus.

The hormone implant protects against unwanted pregnancy for a period of three years. After that, it will gradually become less effective and the implant will have to be removed by a gynecologist (21). A new implant can then be inserted immediately, which means that the woman is protected against pregnancy without interruption. It is also possible to remove the implanted rod prematurely, for example in the event of intolerance.

The implant may only be used by trained gynecologists directly under the skin on the inside of the upper arm. A special applicator is used for this. Before the gynecologist begins the procedure, the area on the upper arm is anesthetized locally. The hormone implant can be placed between the first and fifth day of your cycle. The insertion itself only takes a few minutes. The implant in the upper arm is not visible. However, it can be felt. This is also important so that the doctor can easily locate it when it is removed.

The hormone implant is one of the most modern methods of contraception. It offers well-tolerated long-term protection. As with any drug, however, in addition to the desired effect, undesirable side effects can also occur (22).

#### The advantages

- Long-term contraception: The hormone implant offers reliable protection for a period of three years.
- The hormone implant is also during the Breastfeeding suitable.
- The hormone implant is particularly suitable for women who do not have a estrogen tolerate.
- The hormone implant is effective immediately.
- Through the hormone implant can Menstrual cramps to enhance.

#### The disadvantages

- The hormone implant does not protect against sexually transmitted infections.
- Hormone-related side effects are possible. These include, for example headache, Weight gain, skin blemishes (e.g., acne), Feeling of tension in the breasts.
- Prolonged bleeding or intermenstrual bleeding may occur.

- The menstrual period can also stop completely after using the hormone implant for several months.
- Must be taken as part of a minor surgery local anesthesia can be inserted and removed again by a doctor. The procedure can leave a small scar in the upper arm (23).

### **The Contraceptive Patch**

The contraceptive patch is a small, thin, skin-colored, self-adhesive patch. It is 4.5 x 4.5 cm and is stuck directly onto the skin. Like the combination pill, the contraceptive patch contains the female sex hormones estrogen and progestin, which are absorbed through the skin. This will prevent monthly ovulation (24).

The patch is placed on the skin for seven days on the first day of menstruation. The patch must then be replaced with a new one. This change should always take place on the same day of the week. After three weeks, there is a seven-day break, during which there is bleeding (25). After the patch-free week, a new patch is put on again - even if the bleeding continues.

The following areas of the body are suitable as adhesive points for the plaster:

- Belly
- Buttocks
- Outside of the upper arms
- Entire torso except for the chest

If you forget to change the patch, this can be done within 48 hours. Thereafter, there is no longer any reliable protection against unwanted pregnancy. To be on the safe side, an additional contraceptive (e.g., Condoms) be used.

The contraceptive patch is ideal for all women who do not want to think about contraception every day. As with any medication, the contraceptive patch can have undesirable side effects in addition to the desired effect (26).

### The advantages

- The contraceptive patch only needs to be used once a week.
- Vomiting and diarrhea do not affect its effectiveness.

### The disadvantage

- The contraceptive patch does not protect against sexually transmitted infections.
- Irregular bleeding is possible due to the hormone release.
- The contraceptive patch can cause side effects such as: headache, Reactions where the patch was attached, nausea, breast tenderness.
- The contraceptive patch cannot be used during the Breastfeeding because the baby would absorb too much hormone through breast milk. The estrogen effect can also stop the flow of milk.
- If you are overweight (over 90 kg), the effectiveness of the contraceptive patch is reduced.
- The patch is visible.
- Not suitable for smokers over 35, women with high blood pressure or tendency to thrombosis or Liver disease.
- Skin irritation may occur (27).

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