



# Hormonal Contraceptive Chronic Toxicity in Females: A Review

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## Abstract

A contraceptive being a prevailing method for the purpose to prevent pregnancy has been pursued for a long time. The hormonal contraceptives are preferred universally, to prevent pregnancy either in the form of oral pills or injectables. There is a colossal adoption of hormonal contraceptives for crime purpose to prevent pregnancy in continued rape for a period of time, illegal prostitution and other cases. The hormones consist of estrogens and progesterone which are the female primary sex hormones which control pregnancy and menstruation cycle. Hormonal contraceptives are prepared synthetically in the form of pills, injections, vaginal rings and several others forms. These synthetically prepared hormones, when consumed for long period, cause toxicity in the body. The chronic toxicity produced in the body results into health hazards mainly, overweight, ovarian cancer, organ damages, irregular menstruation cycles, negative behavioural changes, cardiovascular effects can be seen in women's consuming dosage with smoking. The use of these hormonal contraceptives especially when considering crime such as human trafficking, illegal prostitution, child abuse, and continued rape causes the damage of organs in the female body. Toxicity of such hormones can lead to death in females.

**Keywords:** Hormonal; Contraceptive; Oestrogen; Progesterone; Toxicity

## Introduction

Hormonal contraceptive which also referred to as the birth control method is usually adopted as a manner of preventing pregnancy by the women's who are under their fertility phase mainly ranging from 15-50 years. Globally, the hormonal contraceptive is used by the major population of sexually active females and even used for the criminal purpose. Substantially cases have been reported from so many years contradicting the use of hormonal contraceptive in case of human trafficking, child abuse, rape, and prostitute cases.

Hormonal Contraception is adapted based on the method of consumption, type of hormone and the dosage of the hormone. The hormone which is used for the contraception is either estrogens, progesterone or in the combination of both. Extensive population prefers and comfortable in consuming the hormones in form of an oral pill and also can be consumed by injection, implanted in body tissues, inserted from the vagina, or can be absorbed from the patch of the skin.

### Type of hormones in hormonal contraception

**Estrogens:** also called oestrogen, is the primary sex hormone that promotes the growth, development, and regulates the female reproductive system and secondary sex characteristics. In females, estrogens are mainly produced in the female ovaries. Also, estrogens are produced by fat cells and adrenal gland. That is why a very small amount of estrogens is also produced in the male body [1]. Estrogens are the main hormone that is produced during the puberty in the female body that is responsible for the development of all the secondary female organs – breast, hips, pubic hairs, armpit hairs. Menstruation in females is regulated by estrogens as it helps in the building of the uterus wall and decreases on the very low level at the time of menstruation and thus the uterus wall sheds. There are 3 types of chemicals similar to estrogens that are produced in the female body i.e. estrone, estradiol, and estriol. Also during pregnancy placenta produces estrogens specifically estriol. Post pregnancy estrogens control lactation and changes in the breast.

So the intake of hormonal contraceptives which consist of estrogens can result in several health problems and can also cause estrogens toxicity in the female body on regular intake which may lead to death.

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**Progesterone:** is the sex hormone in the body and plays a major role in pregnancy. It is produced in the ovaries, by the adrenal gland, and by the placenta during the pregnancy. Low level of progesterone is also present in the male body. Progesterone's most important functions are to cause the endometrium (the outer most wall of the uterus) to secrete special proteins during the second half of the menstrual cycle, preparing it to receive and nourish an implanted fertilized egg. During the menstruation, the progesterone level is on peaks and results into several symptoms that can be observed as a Pre-Menstruation Syndrome (PMS) or during menstruation such as mood swings, bloating, food cravings, breast tenderness, and acne on face. Pregnancy progesterone level remains elevated throughout. Progesterone also encourages the growth of milk-producing glands in the breast during pregnancy. When progesterone is consumed as a hormonal contraceptive the level raises in the body and the regular usage can disturb the normal functioning of the body causing toxicity and further health problems. In combination oral pills progestin is used with estrogen.

### General effects of hormonal contraceptive medicines

Females under their fertility period consume contraceptive pills to prevent pregnancy. On the continuous usage of hormonal contraceptives causes several changes in the female body which affect the complete function of the body. The manufactured hormonal contraceptives are synthetic hormones which result in depression, cancer, irregular menstrual cycles, acne, enlarged breast, and hips. The protracted use of hormonal contraceptives up to a certain period can cause ovary cancer, breast cancer, mood swings to high extents, psychological problems, weight gain and loss of appetite. This dosage causes chronic toxicity of estrogen and progesterone in the body that may lead up to death directly or may be indirect by causing disease.

### Methodology

The study was conducted to summarize the use of hormonal contraception causing chronic toxicity and its effects in females. The journal articles were assessed to compile the data. Various authenticated servers like science direct, Elsevier direct, pub med were used to collect and compile data.

## Result and Discussion

### Hormonal contraceptive chronic toxicity

Chronic toxicity, the development of adverse effects as a result of long-term exposure to a contaminant or other stressor, is an important aspect of aquatic toxicology [2]. Toxicity is the degree to which a chemical substance or a particular mixture of substances can damage an organism [3]. Hormonal contraceptives are highly used all over the world for the purpose to avert pregnancy. The longer use of these hormonal contraceptives causes toxicity in the body which may lead to the organ damage, causing diseases, weight gain mainly around breast and hips, irregular menstrual cycles, lack of fertility and several psychological problems especially negative mood swings resulting into depression. Chronic toxicity of hormonal contraceptives may also lead to death, directly or indirectly. A study conducted by Charlton et al (2014) has discussed the Oral contraceptive use and mortality after 36 years of follow-up in the Nurses' Health Study [4]. In this study they have concluded that hormonal contraceptives use among the females was correlated with the convinced causes of death, including increased rates of violent or accidental death and deaths due to breast cancer. Whereas among women deaths due to ovarian cancer were less common who has been used hormonal

contraceptives in any form.

### Effect on behavior

The use of hormonal contraceptives by females globally helps to avert pregnancy. But as a major concern, it causes a lot of behavior changes in females. A study conducted by Shakerinejad et al. in which they have discussed the factors predicting the mood change among the oral contraceptive users. In which they have studied around 500 women aging between 15-49 years using a low dosage of oral hormonal contraceptives [1]. Their study among the Iraq population has concluded that around 406 women have faced negative behavior changes can be called as mood swings. Several cases have been reported saying that women's have been facing severe depression because of consuming hormonal contraceptives regularly. Thus, the negative behavior results in the depression or several other psychological problems.

### Effect on pregnancy

Hormonal contraceptives are used to avoid pregnancy, but when the individual decides to get pregnant subsequently having a longer dosage of these contraceptives it becomes quite impossible to become fertile again, due to the toxicity of hormone caused in the body. A study conducted by Hassan et al. (2004) has discussed the previous use of hormonal contraception associated with a detrimental effect on subsequent fecundity [5]. In the study, they have concluded the effect of hormonal contraceptives was stronger with long-term use, in older, obese or oligomenorrhoeic (infrequent menstruation periods) women. After the use of hormonal contraceptives a significant reduction in fecundity occurs, which is also dependent on the factor that for long it has been consumed. The effect is conspicuous in women with a potentially compromised ovarian function. Also, the use of progesterone pills is not associated with a significant effect when compared to combination or estrogen-only pills.

### Effect on menstrual cycle

The hormonal contraceptive pills are consumed on 21 days cycle before the menstruation cycle. The hormones estrogens and progesterone's levels are responsible for the menstruation cycle. During the menstruation, the estrogen rate in the body decreases to a low level while the progesterone level is on peaks. The longer dosage of these hormones causes toxicity which results in the irregular periods. The hormones affect the uterus lining that causes menstruation. The irregular periods further causes the abnormal bleeding, negative mood swings, weight gain and premenstrual syndrome.

### Cardiovascular risk factors

Cardiovascular risks are high for the females having hormonal dosage along with the smoking habits for a longer period. A study conducted by Rotermann et al has discussed the oral contraception use among women's of 15-49 years. In the study, they have concluded that the cardiovascular risk factors except smoking were less prevalent among the hormonal contraception users than among non-users aged 15 to 49 [6]. Also, the hormonal contraceptive users were significantly fewer than non-users to be overweight, obese, or have heart disease, stroke and/or hypertension. When these cardiovascular risk factors were combined into a single dichotomous measure, hormonal contraceptive users were significantly less likely than non-users to have at least one.

## Conclusion

The study of hormonal contraceptive chronic toxicity in females

and its effects is a very critical topic in an aspect of female health. Globally females has been witnessed the use of contraceptives in any form once in their lives. On the same note the adoption of hormonal contraceptives for longer period leads to lack of fertility, negative behavior introduced resulting into depression, irregular menstruation cycle, organ damage, ovarian cancer, uterus cancer and the females smoking along with dosage are reported with the cardiovascular risk. However, it cannot be measured that after how long the hormonal contraceptives can cause toxicity in the female body. As toxicity is also affected by several factors including immunity, dosage, for how long dose has been consumed, nature of dosage and so on. Though, it can be concluded that an adoption of hormonal contraceptives for longer period causes toxicity which may lead to death like situation by damaging the internal organs of the female body.

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