

How Hormonal Birth Control Affects Depression

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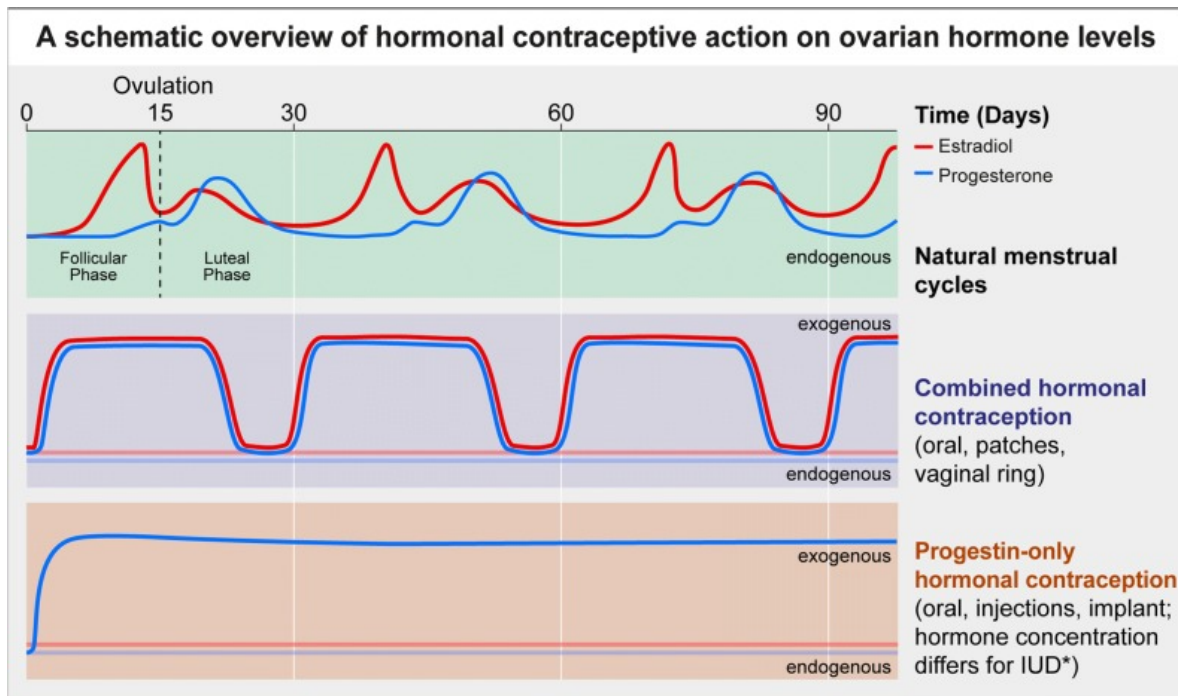
ABSTRACT

In the 21st century, millions of women have gained access to hormonal birth control (HC) (1). However, with the increased usage of hormonal birth control, women have reported many side effects, including increased depressive episodes (11). Unfortunately, the relationship between HC and depression is inadequately addressed by health care professionals (15). They do not always support the particular HC side effects that may affect women with previous or current psychological illnesses (15). HC influences the progesterone and estrogen cycles which can exacerbate psychological symptoms (3). Furthermore, its usage has been linked to dampened stress response in women (17). Overall, HC is a positive invention, but with growing evidence, it is linked to an increased prevalence of depression (11). In this review article, we will discuss evidence supporting this relationship.

INTRODUCTION

Women have been using the birth control pill since the 1960s (1). Over the past 63 years, the pill has continued to evolve with the help of technological advancements that optimize the crucial chemical reactions needed for it to function more effectively(1). After being approved by the Food and Drug Association (FDA) in 1960, the use of the pill skyrocketed over the next two years and successfully reached 1.2 million women across the US (1). Soon after its introduction, the birth control pill reached other parts of the world, and now 300 million women worldwide use it (1). Some say the birth control pill was modern medicine's most "socially significant" invention (2). Women often take the birth control pill to prevent pregnancy and to help sex hormones, and how the pill does this is widely misunderstood or unknown to the user. Ultimately, the birth control pill stops or reduces ovulation during a woman's menstrual cycle (3). Ovulation is the menstrual cycle stage in which women are most likely to get pregnant; thus, stopping or reducing ovulation reduces the chance of pregnancy (4). Even though the birth control pill is an incredible invention, it does come with some adverse effects.

Women have two main sex hormones, estrogen, and progesterone (3).The body naturally makes these hormones and they are primarily responsible for pregnancy (3), puberty (5), menstruation (6), and menopause (7). The birth control pill introduces estradiol and progestin (synthetic versions of estrogen and progesterone) into the system (8). The synthetic sex hormones travel through the bloodstream to the pituitary gland, which then sends a message to the brain to stop the natural production of estrogen and progesterone (9) (Figure 1). Synthetic sex hormones can cause hormonal imbalance because they are not always evenly distributed in an individual's body (10), leading to emotional and physical problems (10). One of the most prevalent emotional problems related to the birth control pill is depression (11).



Adapted and modified Figure 1: Lewis, Carolin A et al. "Effects of Hormonal Contraceptives on Mood: A Focus on Emotion Recognition and Reactivity, Reward Processing, and Stress Response." *Current psychiatry reports* vol. 21,11 115. 7 Nov. 2019, doi:10.1007/s11920-019-1095-z.

The Effect of Hormonal Contraceptives on the Women's Natural Menstrual Cycle - (A)
This figure displays the natural menstrual cycle (top row), the effect of the combined hormonal contraception (middle row) on the natural menstrual cycle, and the effect of the progestin-only hormonal contraception (bottom row) on the natural menstrual cycle of to estradiol and progesterone.

How birth control affects depression

Depression is one of the most common mental illnesses in the world (12), affecting nearly 121 million people worldwide (12). Women are about twice as likely to be diagnosed with depression as men due to hormonal changes (13). Throughout a woman's lifetime, there are specific phases when they are more likely to develop depression (13) due to the significant hormonal changes that are happening during those times. These phases would be during puberty (13), prior to menstruation (13), following pregnancy (postpartum depression) (13), and at perimenopause (13). Unfortunately, many young women between the ages of 15 and 34, who are on the birth control pill, report depression as a significant side effect and are discontinuing the use of it (11). There seems to also be a time component associated with when women start taking birth control and the emergence of major depressive disorder.

According to the United States National Health and Nutrition Examination Survey, adolescents who use OC birth control are more sensitive and thus more susceptible to developing MDD than nonusers or women who use it later in life (14). Researchers continue to search for one clear answer, in the meantime, we have to try and make conclusions based on the information currently available.

Communication barriers between medical healthcare providers and patients regarding hormonal birth control usage

Growing concern regarding HC is specific to the lack of communication regarding possible side effects when starting HC usage. According to a recent 2023 cross-sectional survey-based study, it was reported that 83% of participants stated that their health care providers did not properly prepare them for the possible psychological side effects of the birth control pill (15). This is a liability and affects the trust needed between the patient and their healthcare provider (15). In the same study, 17% of the participants were concerned that their providers were biased towards certain HCs or HC in general (15). It is partially believed that some healthcare providers avoid this level of transparency with their patients because they are financially compensated when a patient successfully goes on HC.

However, it is also believed that some healthcare providers are not aware of the specific psychological side effects. The study mentioned above suggests a disconnect between existing journals and articles on the subject and patients' experiences. The existing literature on the psychological side effects of HC is limited and largely inconclusive, making it challenging for healthcare providers to obtain a clear answer (15). Additionally, according to a journal dedicated to contraception counseling, three of the most common issues that can arise during contraception counseling are clinician preference or bias, discussion of personal experience other than the patient's, and avoidance of less available or familiar methods (18). This illustrates that although many patients trust their healthcare providers, many consistently experience communication barriers between them and their healthcare providers.

Psychological illnesses related to Hormonal Contraception

Women with a history of psychological illnesses have reported being significantly more susceptible to mood changes as a side effect of their HC (15). According to the cross-sectional survey mentioned earlier, 37% of participants experienced mood changes such as increased depression and stress as a side effect of the HC and had no reported history of psychiatric illness (15). One theory researchers have as to why this occurs is due to the HC interfering with the adrenocortical response to psychological stress. HC influences the amount of cortisol released causing unnatural cortisol level fluctuations that can adversely affect the way women respond to stress which can lead to depression and severe anxiety (16).

63% of the survey participants who experienced mood changes as a side effect of the HC had a reported history of psychiatric illness (15). These reported rates of mood changes were significantly higher than those with no reported history of psychiatric illness, meaning individuals

with a history of psychiatric illness are more susceptible towards experiencing negative mood changes while on HC. This is consistent with the findings from a 2019 investigative study that also reported that the adverse effects of HC on mood are more prevalent in women with a history of depressive and psychiatric symptoms. Additionally, they mention a blunted response and a potential dysregulation of stress response (17). This may be due to the HC aggravating the psychiatric illness through the unnatural cortisol level fluctuations that the HC causes.

CONCLUSION

This article highlights the effect HC may have on depression and other psychological illnesses (15). According to the resources used to create this article, there is a growing concern as to the communication between healthcare providers and their patients on how birth control regulates a woman's estrus cycle and the effect it may have on their psychological well-being.

In addition to communication barriers between medical healthcare providers and patients, this article also explores the likelihood of developing psychiatric illnesses while on HC based on where a woman is in her life (puberty, prior to menstruation, following pregnancy, and perimenopause) (13).

Not only do we know that HC may cause or exacerbate existing psychological disorders, but according to a study done in 2014, there is also concern as to the effect it might have on mate selection (19). When women are at their most fertile point in their menstrual cycle, they look for specific alpha male characteristics in a mate. HC may alter their preferences changing the genetic quality of future generations (19).

Although there are some negative connotations associated with HC, there are also some positive ones. HC has also been shown to help menses and women with irregular cycles, such as PCOS (polycystic ovary syndrome) by regulating the estrous cycle (20). As beneficial as this can be for certain users it does not negate the other side effects, such as psychological illnesses and depression.

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