ACUMEN: INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH
ISSN: 3060-4745 IF(Impact Factor)10.71 / 2025 Volume 3, Issue 5

THE RELATIONSHIP BETWEEN DEPRESSION IN WOMEN AND REPRODUCTIVE HORMONAL CHANGES

Tillayeva Zarina Zafarbekovna
zarina_tillyayeva@tues.uz
https://orcid.org/0009-0000-9394-5324
Qodirov Shodmon
Rustamov Abdukarim
Termiz iqtisodiyot va servis universiteti
Tibbiyot fakulteti

Abstract

Depression in women is a complex biopsychosocial condition influenced by genetic vulnerability, brain chemistry, life stress, trauma, social factors, medical illness, and reproductive hormonal changes. Across the female life span, periods of major hormonal fluctuation—puberty, the menstrual cycle, pregnancy, the postpartum period, perimenopause, and menopause—are associated with increased vulnerability to mood symptoms in some women. Importantly, reproductive hormones do not "cause" depression in every woman; rather, some women appear to have increased sensitivity to normal hormonal changes, especially fluctuations in estrogen and progesterone. This hormone sensitivity can influence neurotransmitter systems, stress-response pathways, sleep, inflammation, and emotional regulation.

The most clinically recognized hormone-related mood conditions include premenstrual dysphoric disorder, perinatal depression, postpartum depression, and perimenopausal depression. Public health and professional organizations emphasize that depression in women is common and treatable, and ACOG recommends screening for perinatal depression and anxiety at the initial prenatal visit, later in pregnancy, and during postpartum care. This article discusses the biological mechanisms, reproductive stages,

ISSN: 3060-4745 IF(Impact Factor)10.71 / 2025 Volume 3, Issue 5

clinical manifestations, diagnosis, prevention, and treatment implications of the relationship between depression and reproductive hormonal changes in women.

Keywords: women's depression, reproductive hormones, estrogen, progesterone, postpartum depression, perimenopausal depression, PMDD, hormone sensitivity, perinatal mental health.

Introduction

Depression is one of the most important mental health problems affecting women worldwide. Women are generally more likely than men to experience depressive disorders, and this sex difference becomes especially visible after puberty, suggesting that reproductive biology may contribute to vulnerability in addition to psychosocial factors. However, it is scientifically inaccurate to say that hormones alone cause depression. A more precise explanation is that reproductive hormonal fluctuations can act as biological triggers in women who are vulnerable because of genetic predisposition, previous depression, trauma, chronic stress, sleep disruption, medical illness, or increased sensitivity of the brain to estrogen and progesterone changes.

Reproductive hormones have broad effects on the central nervous system. Estrogen interacts with serotonin, dopamine, norepinephrine, glutamate, and GABA systems, all of which are involved in mood regulation, motivation, anxiety control, sleep, cognition, and emotional processing. Progesterone and its neuroactive metabolite allopregnanolone influence GABA-A receptor activity, which is related to calmness, irritability, anxiety, and stress tolerance. Therefore, when reproductive hormones fluctuate rapidly—as they do before menstruation, after childbirth, or during perimenopause—some women may experience mood destabilization.

The relationship between depression and reproductive hormones is especially important because many women experience mood symptoms during predictable reproductive transitions. These include the late luteal phase of the menstrual cycle, pregnancy, postpartum hormonal withdrawal, and the menopausal transition. NIMH materials describe that changes in reproductive hormones can trigger mood disorders

such as postpartum depression, premenstrual dysphoric disorder, and perimenopausal depression.

Clinically, this topic matters because hormone-related depression is often underrecognized. A woman may present with fatigue, irritability, insomnia, anxiety, crying spells, low motivation, appetite changes, or reduced concentration, but the timing of symptoms may not be connected to menstrual cycle, childbirth, lactation, or menopause unless the clinician asks directly. A careful reproductive history can therefore improve diagnosis and treatment.

Materials and Methods

This article was prepared as a narrative scientific review. Authoritative medical and public health sources were used, including the Centers for Disease Control and Prevention, the American College of Obstetricians and Gynecologists, the National Institute of Mental Health, peer-reviewed reviews on reproductive hormone sensitivity, and recent literature on women's mental health. The analysis focused on the following areas: hormonal changes across the reproductive life span, neurobiological mechanisms linking hormones to mood, clinical forms of reproductive depression, risk factors, diagnostic principles, and treatment implications.

The methodological approach was clinical-biological. First, normal reproductive hormonal changes were summarized. Second, mechanisms of hormone sensitivity and neurotransmitter interaction were analyzed. Third, specific reproductive periods—menstrual cycle, pregnancy, postpartum, and perimenopause—were discussed. Finally, clinical screening and management principles were reviewed.

Results

The review shows that the relationship between depression and reproductive hormones is strongest during periods of hormonal fluctuation rather than during stable hormone levels. Estrogen and progesterone levels vary across the menstrual cycle, rise dramatically during pregnancy, fall rapidly after delivery, and fluctuate unpredictably

during perimenopause. These transitions can affect mood regulation in hormonally sensitive women.

Hormonal sensitivity rather than hormone level alone

A key finding from the literature is that many women with hormone-related depression do not necessarily have abnormal hormone levels. Instead, they may have an abnormal mood response to normal hormonal changes. Reviews on reproductive hormone sensitivity describe that increased risk of depression may occur when the brain is more sensitive to changes in estrogen and progesterone rather than because hormones are simply "too high" or "too low."

This explains why two women with similar hormone levels may have very different emotional experiences. One may pass through the menstrual cycle, postpartum period, or perimenopause without depressive symptoms, while another may develop severe mood changes. The difference may lie in receptor sensitivity, neurotransmitter response, stress-axis regulation, inflammatory status, sleep quality, trauma history, and genetic vulnerability.

Premenstrual dysphoric disorder

Premenstrual dysphoric disorder is one of the clearest examples of hormone-related mood disturbance. Symptoms occur in the luteal phase, usually in the one to two weeks before menstruation, and improve shortly after menstruation begins. The condition may include depressed mood, irritability, anxiety, mood swings, low energy, sleep disturbance, food cravings, poor concentration, and physical symptoms such as breast tenderness or bloating.

The key clinical feature is cyclicity. PMDD is not simply "bad mood before periods"; it is a recurrent, functionally impairing disorder linked to the menstrual cycle. The underlying mechanism is thought to involve sensitivity to normal ovarian hormone fluctuations, especially progesterone metabolites affecting GABAergic signaling and estrogen-related serotonin modulation.

Pregnancy and antenatal depression

Pregnancy is often socially imagined as a purely joyful period, but biologically and psychologically it is a major transition. Estrogen and progesterone rise sharply, sleep patterns change, body image changes, nausea or pain may occur, and psychosocial stress may increase. Some women develop depression during pregnancy, especially if they have previous depression, anxiety, poor social support, intimate partner violence, financial stress, unplanned pregnancy, medical complications, or previous pregnancy loss.

Antenatal depression is clinically important because it affects both mother and fetus. It may reduce self-care, impair nutrition and sleep, increase substance-use risk, worsen adherence to prenatal care, and increase risk for postpartum depression. It can also affect birth outcomes indirectly through stress hormones, inflammation, and health behaviors.

Postpartum depression

Postpartum depression is one of the most important reproductive mood disorders. After delivery, estrogen and progesterone levels fall rapidly. This abrupt hormonal withdrawal occurs alongside sleep deprivation, physical recovery, lactation demands, pain, role transition, and social pressure. In vulnerable women, this combination can trigger clinically significant depression.

Postpartum depression is different from the common “baby blues,” which are usually mild, transient, and resolve within about two weeks. Postpartum depression is more persistent and impairing. Symptoms may include sadness, emotional numbness, guilt, loss of interest, severe anxiety, irritability, sleep disturbance even when the baby sleeps, appetite changes, hopelessness, difficulty bonding with the baby, and thoughts of self-harm or harm to the infant. CDC emphasizes that depression and postpartum depression are treatable and that women should seek care as early as possible if symptoms occur.

ACOG’s 2023 clinical guidance includes screening and diagnosis recommendations for perinatal mental health conditions, including depression, anxiety, bipolar disorder,

suicidality, and postpartum psychosis. ACOG recommends screening for perinatal depression and anxiety at the first prenatal visit, later in pregnancy, and at postpartum visits.

Perimenopausal depression

Perimenopause is another high-risk period because estrogen levels fluctuate unpredictably before eventually declining. Many women experience vasomotor symptoms, sleep disruption, night sweats, irregular bleeding, cognitive complaints, anxiety, and mood changes. A major point is that perimenopause is not only a reproductive transition; it is also a neuroendocrine transition.

Recent discussion of perimenopausal mental health emphasizes that women may experience increased risk of depressive symptoms during this period. A 2024 report described a study involving 9,141 women globally, in which perimenopausal women had a higher risk of depression than premenopausal women. Although media reports should not replace clinical guidelines, they reflect growing scientific and public health attention to perimenopause as a vulnerable mental health window.

Mechanistically, estrogen fluctuation can affect serotonin and dopamine pathways, sleep, thermoregulation, and stress sensitivity. Sleep disruption from night sweats can itself worsen depression risk. Women with a history of PMDD, postpartum depression, major depression, trauma, or bipolar disorder may be especially vulnerable during perimenopause.

Discussion

The connection between depression and reproductive hormonal changes should be understood through the concept of **biological sensitivity within a psychosocial context**. Hormones are important, but they do not act in isolation. Depression emerges when hormonal changes interact with brain vulnerability, stress, sleep disruption, inflammation, personality factors, social support, and life circumstances.

Neurotransmitter mechanisms

Estrogen has important effects on serotonin synthesis, receptor expression, serotonin transporter function, and monoamine oxidase activity. Since serotonin is central in mood regulation, estrogen withdrawal or fluctuation may contribute to depressive symptoms in sensitive women. Estrogen also influences dopamine pathways, which are related to motivation, reward, attention, and energy. This may help explain why some women report loss of motivation, anhedonia, poor concentration, and fatigue during hormone-transition periods.

Progesterone is more complex. It can have calming effects through allopregnanolone, a neurosteroid that modulates GABA-A receptors. However, in some women, fluctuations in allopregnanolone may paradoxically be associated with irritability, anxiety, dysphoria, and mood instability. This mechanism is especially relevant to PMDD and possibly postpartum depression.

Stress axis and inflammation

Reproductive hormone changes also interact with the hypothalamic-pituitary-adrenal axis, which regulates the stress response. Women with chronic stress, trauma history, or poor sleep may have altered cortisol regulation. During reproductive transitions, this may increase vulnerability to depressive episodes.

Inflammation is another important pathway. Pregnancy, postpartum recovery, obesity, autoimmune disease, sleep deprivation, and psychosocial stress can all influence inflammatory signaling. Inflammation may affect neurotransmitter metabolism and neuroplasticity, contributing to depressive symptoms.

Sleep as a bridge between hormones and mood

Sleep disturbance is one of the strongest practical links between reproductive hormonal changes and depression. Premenstrual symptoms, late pregnancy discomfort, newborn care, night feeding, hot flashes, and perimenopausal night sweats can all disrupt sleep. Poor sleep reduces emotional regulation, increases irritability, worsens anxiety, and increases depressive risk. Therefore, treating sleep problems is not secondary; it is a central part of managing hormone-related depression.

Why reproductive history matters

A reproductive mental health history should include age at menarche, menstrual regularity, PMS/PMDD symptoms, mood changes with hormonal contraception, infertility treatment, pregnancy mood history, miscarriage or pregnancy loss, postpartum depression, breastfeeding status, perimenopausal symptoms, age at menopause, and surgical removal of ovaries. These details can reveal patterns that a general psychiatric history may miss.

For example, a woman who reports depression only in the late luteal phase may need PMDD-focused assessment. A woman who becomes severely depressed after childbirth may have postpartum depression. A woman in her late 40s with new insomnia, hot flashes, anxiety, and mood symptoms may need evaluation for perimenopausal depression. Recognizing these patterns helps clinicians choose better treatment and monitoring.

Clinical management implications

Treatment depends on severity, reproductive stage, safety, and patient preference. Psychotherapy, especially cognitive behavioral therapy and interpersonal therapy, can be effective for depressive symptoms related to reproductive transitions. Lifestyle interventions—regular physical activity, sleep protection, nutrition, reducing alcohol, stress management, and social support—are clinically meaningful.

Medication may be necessary for moderate to severe depression, recurrent depression, suicidality, marked functional impairment, or when psychotherapy alone is insufficient. Selective serotonin reuptake inhibitors are commonly used for major depression, PMDD, and perinatal depression, but pregnancy and lactation require individualized risk-benefit discussion. For severe postpartum depression, specialized treatments may be considered depending on local availability and clinical indication.

Hormonal therapy may help some women, particularly in perimenopause when vasomotor symptoms and sleep disruption contribute to mood symptoms, but it is not appropriate for everyone. It must be individualized based on cardiovascular risk, breast

cancer risk, thromboembolic history, age, time since menopause, and patient goals. Mayo Clinic appropriately notes that hormonal changes alone do not cause depression; other biological, inherited, and life circumstances also contribute.

Red flags

Immediate clinical attention is needed if a woman has suicidal thoughts, thoughts of harming the baby, psychotic symptoms, severe agitation, inability to sleep for days with elevated energy, confusion, or signs of bipolar disorder or postpartum psychosis. These are urgent conditions and should not be treated as ordinary hormonal mood swings.

Conclusion

Depression in women is strongly shaped by reproductive biology, but it is not caused by hormones alone. The most accurate view is that reproductive hormonal changes can trigger depressive symptoms in vulnerable women through effects on serotonin, dopamine, GABA, stress-response systems, sleep, inflammation, and emotional regulation. The highest-risk periods include the premenstrual phase, pregnancy, postpartum, and perimenopause.

Clinically, the relationship between depression and reproductive hormonal changes is important because it allows earlier recognition and more individualized care. Screening during pregnancy and postpartum is recommended by ACOG, and clinicians should also pay attention to menstrual-cycle-related symptoms and perimenopausal mood changes. A woman's reproductive history should be considered a vital part of mental health assessment.

The main clinical message is clear: hormone-related depression is real, common, and treatable. Proper diagnosis, timely screening, psychotherapy, medication when needed, sleep support, lifestyle intervention, and individualized reproductive care can significantly improve women's mental health and quality of life.

References

1. Centers for Disease Control and Prevention. Symptoms of Depression Among Women. 2024.
2. American College of Obstetricians and Gynecologists. Screening and Diagnosis of Mental Health Conditions During Pregnancy and Postpartum. Clinical Practice Guideline No. 4, 2023.
3. ACOG. Patient Screening: Perinatal Mental Health.
4. National Institute of Mental Health. Depression in Women: 5 Things You Should Know.
5. Soares CN, Zitek B. Reproductive hormone sensitivity and risk for depression across the female life cycle. 2008.
6. Schiller CE, Meltzer-Brody S, Rubinow DR. The Role of Reproductive Hormones in Postpartum Depression. 2014.
7. Mayo Clinic. Depression in women: Understanding the gender gap.
8. Wieczorek K, et al. Reproductive Hormones and Female Mental Wellbeing. 2023.