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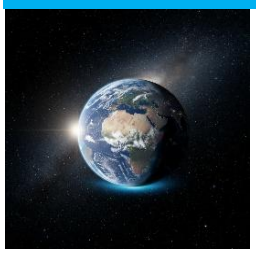

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Mental Disorders in Postpartum Period and Lactation: A Literature Review

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Abstract

Traditionally, postpartum mental problems have been characterized as major depressive disorder, obsessive-compulsive disorder, bipolar disorder, postpartum psychosis, and postpartum blues. The difficult postpartum phase is characterized by major changes in one's physical, biological, social, and emotional makeup. This period necessitates significant interpersonal and personal adjustment, especially for primigravida women. A wide range of emotions are typical during pregnancy and the postpartum phase, ranging from anticipation, fulfillment, and excitement to feelings of anxiety, confusion, frustration, guilt, and sadness. This may cause the mother's psychological condition to deteriorate. Misdiagnosis and inadequate treatment of prenatal mental illnesses are common. Both the mother and the child may have long-term effects from postpartum mental health disorders. The postpartum psychological state might become so severe that hospitalization is required. Furthermore, this conditions might have a negative impact on mother-infant connection and attachment. Early diagnosis and starting the treatment of postpartum psychiatric disorder is important, which can result in faster and quicker recovery. When the disease is mild or in its early stages, non-pharmacological treatment methods like psychotherapy, psychoeducation, and social and familial support might be beneficial. When the condition is more serious, medication is used. However, women should be mindful of the risks and benefits of using psychoactive medications during lactation, even though pharmacological treatment is more effective. Numerous factors, such as the mother's medication dosage, the time and frequency of dosing, the mother's drug metabolism rate, and the infant's drug metabolism, influence how much drug an infant is exposed to.
Keywords: postpartum period, lactation, psychopharmacological treatment

Introduction

Women who have a history of mental illness or a family history of mental illness may be more vulnerable during the postpartum period. During the postpartum phase, mental illnesses are common. Diagnosing postpartum mood disorders and psychoses is necessary to avoid negative short- and long-term consequences for mothers and newborns. The three mental disorders most common after the birth of a baby are postpartum blues, postpartum depression, and postpartum psychosis. Depression and psychosis present risks to both the mother and her infant, making early diagnosis and treatment important.

The term postpartum blues refers to a brief period of irritation, anxiety, poor focus, insomnia, tearfulness, and mild, frequently rapid, mood swings from euphoria to despair. It is a highly prevalent condition that affects 50 to 80 percent of new mothers. Postpartum blues typically appear two to three days after birth and should fade as hormone levels begin to regulate. Symptoms often peak on the fifth postpartum day and resolve within two weeks. Providing support and comfort to the new mother, as well as emphasizing the significance of proper sleep

and rest, is usually effective treatment for postpartum blues. Minor tranquilizers (e.g., lorazepam) in modest doses may help in treating insomnia. (Rai et al, 2015)

Postpartum depression (PPD) is a severe form of depression that occurs less frequently than postpartum blues. Excessive guilt, anxiety, anhedonia, depression, insomnia/hypersomnia, suicidal ideation, and exhaustion are all signs of PPD. It can begin at any time after delivery, with a peak incidence occurring within the first four months postpartum, and last for up to a year. PPD is estimated to affect roughly 13% of new mothers. Treatment for postpartum depression has an overall success rate of 80%. (Steward&Vigod, 2019)

Pregnancy-associated first-onset psychosis is a rare but serious condition. It is estimated that postpartum psychosis affects one to two women per 1,000 live births. This disorder necessitates urgent medical and obstetric intervention due to its potential for rapid progression, with symptoms typically emerging within the first two weeks after childbirth, or, at the latest, within three months. Affected individuals may display signs of psychotic depression or experience an acute manic episode, which can manifest as agitation, hallucinations, delusions, erratic behaviour, cognitive impairments, and diminished self-awareness. Treatment for postpartum psychosis often includes electroconvulsive therapy or pharmacological approaches such as mood stabilizers, antipsychotics, and antidepressants. Mothers who have postpartum psychosis are more likely to get it again in their future pregnancies. (Sit et al., 2006)

First-onset of bipolar disorder is usually diagnosed between 18 and 30 years of age, which usually coincides with pregnancy and childbirth. (Rusner et al., 2016). Impatience, animosity, hurried speech, and flight of ideas or racing thoughts are some of the early signs of this illness. The first episode of bipolar disorder can be brought on by a number of risk factors, including having a parent, sibling, or first-degree family who has the illness. However, major life events, including pregnancy, can also trigger the first episode of bipolar disorder. According to the research, bipolar disorder is more likely after a live birth than after a miscarriage or termination of pregnancy. (Balaram&Marwaha, 2022)

The management of postpartum disorders generally involves a holistic approach that includes reassurance, support from family and friends, psychoeducation, and, when needed, psychotherapy and/or medication.

In situations involving postpartum psychosis (PP), it may be necessary to separate the mother from her infant. For those experiencing moderate to severe depression and postpartum psychosis, medication is essential. It is crucial to carefully consider both the benefits and drawbacks of administering mental health medications while breastfeeding. The extent to which a newborn is exposed to these medications is influenced by several factors, including the dosage taken by the mother, the timing and frequency of the doses, the mother's rate of drug metabolism, and the infant's own metabolism of drugs. Commonly prescribed pharmacological treatments include antidepressants, lithium, anticonvulsants, benzodiazepines, and electroconvulsive therapy.

Routine screening for perinatal mental health conditions should be integrated into the evaluation process during postpartum clinic appointments. These conditions are often overlooked, yet they can significantly impact the mother, her child, and her relationships with her partner and family. Early identification and intervention are essential for improving outcomes. When postpartum disorders—particularly affective psychosis and brief psychotic disorders—are recognized and treated promptly, they typically yield a positive prognosis.

Additionally, women experiencing postpartum psychosis related to bipolar disorder generally have a favorable outlook; studies show that 75-86 percent remain symptom-free after their first episode.

The more symptoms resemble schizophrenia, the greater the chance of long-term damage. The probability of recurrence is very high. Relapse rates in subsequent pregnancies might range between 25 and 40%. (Rai et al., 2015)

1.1 Postpartum blues – symptoms, diagnosis

Symptoms of mild depression and a transient, self-limiting low mood are referred to as postpartum blues. Postpartum blues symptoms include crying, sadness, labile mood, poor focus, fatigue, dysphoric affect, irritability, anxiety, insomnia, and changes in appetite. When they do occur, these symptoms shouldn't fit the criteria for either major depressive disorder or postpartum depression, if they occur during the postpartum phase. In order for symptoms to be diagnosed as postpartum blues, they must appear two to three days after delivery and disappear within two weeks. The diagnostic criteria for postpartum depression are satisfied if the symptoms persist for more than two weeks. One clinical tool for screening for postpartum depression is the Edinburgh Postpartum Depression Scale. Even when evaluating changes in depression over time, it has been shown to have adequate sensitivity and specificity across population groups. Sleep issues, low energy, and slight mood swings are typical during the peripartum phase. By determining whether the mood and activity changes are typical peripartum changes or if the symptoms cause the person's life to be impaired or distressed, these can be differentiated from postpartum blues.

The revised DSM-5 defines postpartum blues as a depressive disorder with peripartum start, which must be differentiated from postpartum depression. In the latter case, mood abnormalities should persist for more than two weeks and symptoms should be consistent with those of a depressive episode. The DSM-5 lists the following symptoms as indicators of a depressive disorder: anhedonia, changes in weight or appetite, sleep disturbances or insomnia, psychomotor agitation or retardation, exhaustion or loss of energy, feelings of guilt or worthlessness, difficulty concentrating, and recurrent thoughts of death or suicidal ideation. The same diagnostic criteria are used for depressive disorder with peripartum onset, with the addition that symptoms must occur during pregnancy or within four weeks after birth. (Balaram&Marwaha, 2022)

1.2 Postpartum psychosis - symptoms, diagnosis

According to Wisner et al., women with childbearing-related psychosis commonly show cognitive disorganization and atypical psychotic symptoms. These were frequently signs of an organic disease, such as mood-incongruent delusions of reference, persecution, jealously, and grandiosity, as well as visual, tactile, or olfactory hallucinations. The average age of onset for postpartum psychosis is 26.3 years, which corresponds to the time when the majority of women have their first or second child. Patients with postpartum psychosis typically had higher functional levels prior to the onset of disease when compared to women with persistent mental illness.

Postpartum psychosis must be differentiated from obsessive-compulsive disorder and obsessive-compulsive symptoms. Obsessive-compulsive disorder and OC symptoms are characterized by intrusive thoughts and compulsive, irresistible behaviors. Often, intrusive thoughts center on religious obsessions, a desire for symmetry, objectionable violent or sexual imagery, contamination, and hurting their children. Cleaning, checking, repeating, organizing, hoarding, and mental rituals like counting are examples of compulsions. Women with postpartum depression frequently have comorbid obsessive-compulsive thoughts (41–57%). The preservation of logical judgment and reality checking distinguishes OC or OC disorder from PP; patients often do not act on their aggressive thoughts. Rather, they avoid objects or locations that make them anxious, and they are bothered by their unwelcome thoughts. In contrast, those suffering from florid psychosis are unable to recognize reality, feel pressured to act on their delusions, and are unable to weigh the effects of their choices.

PP is seen as an emergency that calls for a quick assessment, a referral to a psychiatrist, and perhaps even hospitalization. A comprehensive history, physical examination, and laboratory tests are necessary for the initial evaluation in order to rule out an organic etiology of acute psychosis. Important tests include a complete blood count (CBC), electrolytes, blood urea nitrogen (BUN), creatinine, glucose, vitamin B12, folate, thyroid function tests, calcium, urinalysis and urine culture in the patient with fever, and a urine drug screen. A careful neurological assessment is essential; this includes a head CT or MRI scan to rule out the presence of a stroke related to ischemia (vascular occlusion) or hemorrhage (uncontrolled hypertension, ruptured arteriovenous malformation, or aneurysm). The stroke patient is differentiated from the patient with PP by a history of hypertension or preeclampsia, evidence of fluid/electrolyte imbalance, and complaints of severe headache, unilateral weakness, sensory deficits, and even seizures with the neurological event. (Larchmt, 2011).

Table 1. Symptoms, onset and incidence of mental disorders in postpartum period.

Levels	Symptoms	Onset	Incidence
Postpartum Blues	Transitory tearfulness, irritability, fatigue, anxiety	Comes (and goes) within 2 weeks after birth	60-80%
Difficult Postpartum Adjustment/Stress	Extension of blues, feelings of doubt, overwhelmed	Can extend up to 3-4 months after birth, or longer	Unknown
Perinatal/Postpartum Depression/Anxiety	Feelings of inadequacy, despair, extreme anxiety, intense mood changes	Variable onset from right after birth to months later	10-28%
Postpartum Psychosis	Out of touch with reality, delusions, confusion, agitation	Acute & quick onset but can occur later	0.1%-0.2%

Source: Pacific Post Partum Support Society

(Counselling in Hamilton, 2021)

1.3 Major depressive disorder

Postpartum depression is the most common mental illness observed during the postpartum phase. It might be challenging to differentiate PPD from depression at any other point in a woman's life. Unpleasant thoughts, however, are mostly connected to the newborn in PPD. The diagnostic criteria are hard to differentiate from those of a major depressive episode, which is characterized by low energy, anxiety, suicidal thoughts, sleep and food disorders, and a persistently dismal mood. It affects 10–15% of postpartum women. There may also be a considerable concern for the baby's safety or well-being, as well as feelings of guilt or inadequacy over the new mother's capacity to care for the newborn. Numerous research investigations have found that postpartum depression has a higher prevalence of anxiety symptoms than non-PPD. Usually occurring in the first two to three months after labor, onset might occur a few days to a few weeks after delivery. The chance of developing postpartum depression is increased by 25% if a patient has a history of major depression, and by 50% in a patient with previous episode of PPD.

Laboratory investigations and thorough physical examination should be done to exclude organic etiology. Sometimes rare medical conditions, such as frontotemporal dementia or frontal lobe tuberculoma, and Sheehan syndrome can mimic postpartum depression. (Rai et al., 2015).

1.4 Obsessive – compulsive disorder – symptoms, diagnosis

Although symptoms of obsessive compulsive disorder often occur 12–26 weeks after giving birth, some women experience a quicker onset (within days). Obsessions frequently involve worries about purposefully or unintentionally hurting the baby, worrying about the baby dying while they are asleep, worrying about being judged and/or criticized as a mother, cleanliness, symmetry/exactness, or aggression, even though the clinical presentation of postpartum OCD varies greatly. Frequent and ritualistic washing, checking, avoiding, hiding, and seeking confirmation are examples of common compulsions. Generally speaking, obsessions occur more frequently than compulsions. Many women (45%) who experience compulsions and obsessions at two weeks postpartum say that the symptoms are still present six months later. It is important to distinguish OCD symptoms from the "normal" thoughts that worry parents about their child's safety, which affect 34–65% of women after giving birth and are seen as a "normal" aspect of parenthood. Thinking about kid safety may be beneficial in shielding the infant from possible damage because of their adaptive nature. These "normal" preoccupying thoughts are typically fleeting and do not impede proper childcare duties or everyday functioning. Postpartum OCD obsessions, on the other hand, are obviously maladaptive, time-consuming, and can lead to distress or functional impairment.

Obsessional thoughts about harming the infant are not unique to postpartum OCD and have been reported in over 57% of women with postpartum depression. The ruminations in postpartum depression are usually mood-congruent and are not intrusive or distressing as is the case in postpartum OCD. However, postpartum depression (major depressive disorder or bipolar disorder) can co-occur with OCD and should be diagnosed as a comorbid disorder. Use of screening instruments for postpartum depression like Edinburgh Postnatal Depression Scale may be helpful in differentiating these disorders (Sharma et al., 2015).

1.5 Bipolar disorder – symptoms, diagnosis

Most prenatal episodes are sad, while manic and hypomanic episodes are suggestive of bipolar disorder. Clinically, there is no difference between acute bipolar and unipolar depressive episodes. Bipolar I and bipolar II disorder are distinguished by their separate histories of manic or hypomanic episodes. The distinction is crucial during the postpartum phase, which is linked to a high risk of bipolar disorder onset, both new and recurrent. Manic and hypomanic episodes are characterised by an elevated or irritable mood and enhanced energy that lasts for four (hypomania) or seven (mania) days in a row. Patients must also have at least three or four (if an irritable mood is present) additional symptoms present including grandiosity, disturbances in sleeping, rapid and verbose speech, racing thoughts, difficulty focusing, impulsive behaviour, and/or increased goal directed activity at home or at work. (Clark, 2019)

Women with untreated bipolar disorder have an increased risk of gestational hypertension and antepartum hemorrhage, as well as self-injury, substance use, and suicide. Infants may also be affected by a mother with untreated bipolar disorder; they are more likely to be born small for their gestational age, have elevated levels of fetal stress hormones, and have impaired mother-baby bonding. Bipolar disorder is a known risk factor for postpartum psychosis, which carries a risk of suicide and infanticide. (Masters, 2019)

2. Risk factors for PPD

The risk factors which are associated with the development of postpartum disorders include being a single mother, caesarean section, perinatal or natal complications, primigravida, previous history of psychotic illness, especially past history of depression and anxiety, as well as family history of psychiatric disease, especially mother and sister having postpartum disorder and previous episode of postpartum disorder. (Rai et al., 2015). In the largest population based study to date it has been found that the risk of postpartum depression was over 20 times higher for women with a depression history in comparison to women without previous onset of depressive symptoms. (Silverman et al., 2017)

Additionally, stressful life events especially during pregnancy and close to giving birth, partner violence, history of being sexually abused, vulnerable personality traits. unsupportive spouse, being socially isolated as well as lower education level, unstable financial situation, low occupational prestige and having multiple offspring are also considered factors that can trigger the onset of mental disorders. (Frieder et al., 2019, Rai et al., 2015)

Postpartum depression is connected to an increased recurrence rates in both the peripartum and non-peripartum periods. In women who were previously treated with postpartum antidepressants or hospitalized due to PPD, the risk of non-postpartum affective disorder was 6.2 and 6.6 times higher in the years following first childbirth, respectively, and a 27 and 46 times higher recurrence risk rate of postpartum affective disorder following a second birth, respectively, compared to women with no episode of postpartum affective disorder after their first delivery. (Frieder et al., 2019)

2.1. Genetics as a risk factor

Although it is unclear if this vulnerability is separate from or related to the genetic risk for other mood disorders, such as major depressive disorder and bipolar disorder, several studies indicate that there is an underlying genetic sensitivity for postpartum depression (PPD). One way to conceptualize PPD is as a significant depressed episode that starts right after giving birth. Numerous studies have demonstrated that mood swings that happen in the first four weeks after giving birth, in particular, have a genetic foundation.

The most studied potential gene in PPD is the serotonin transporter gene (SERT). The SERT gene has two significant polymorphisms. The short and long variants of the gene are caused by a 44-bp insertion/deletion in the 5-HTTLPR promoter region. The long (L) allele enhances transcriptional efficacy and activity in contrast to the short (S) allele, whereas the S allele has been connected to depression and mental health problems. The 5-HTTLPR polymorphism is the one that is studied the most in PPD. Longer repeat sets are linked to mental health problems and depression. The second polymorphism (STin2VNTR) has a variable number of tandem repeats (VNTR) in the second intron.

Despite conflicting research, there is proof that SERT polymorphisms contribute to PPD. When PPD is identified within the first 6–8 weeks of birth, the 5-HTTPLRP studies tend to be positive, and when PPD is discovered later, they tend to be negative. It has been shown that PPD runs in families, but only if symptoms start to show up within the first four weeks of birth. Thus, only during the postpartum phase may the 5-HTTPLRP polymorphism contribute to PPD risk. It suggests that a significant amount (about 40%) of the risk for PPD has a genetic basis. The genetic risk for PPD may include a component that overlaps with the genetic risk for MDD and/or bipolar disorder, as well as a component that is unique to PPD. Definitional challenges hamper studies aiming to discover genetic risk factors for PPD, such as when to measure the presence or absence of PPD, the timing of development of symptoms (during pregnancy, after delivery, how soon after delivery), and discrepancies in assessment instruments. To date, candidate gene association and familiality studies indicate a stronger genetic basis when postpartum depression is characterized as occurring shortly after birth. (Payne, 2020)

There has also been reported, that the effect of sex steroids on human behaviour can be seen in illnesses such as premenstrual dysphoric disorder, perimenopausal dysphoria, postpartum depression, postpartum psychosis, dysphoria caused by hormonal replacement treatment or oral contraceptives, as well as anabolic steroid-induced aggressiveness. (Westberg&Eriksson, 2008)

2.2. Maternal Age

Most high-income nations have seen an increase in the number of women giving birth at advanced maternal age (>35 years) throughout the past 30 years. It has become a public health concern that older women are more likely than younger mothers to experience severe maternal morbidity, obstetrical intervention, and pregnancy problems. Numerous studies have found a connection between advanced maternal age and chromosomal abnormalities, gestational diabetes, multiple births, caesarean sections, premature birth, low birth weight, and perinatal death. Few studies have examined postnatal depression and the psychological

experiences of older women, despite the large amount of study devoted to comprehending the physiological effects of prolonged maternal age.

Postpartum depression is significant because of its prevalence (10% to 15% of women experience depression after childbirth) and severe consequences on both the mother and the infant. (Muraca & Joseph, 2014)

2.3 Multiple births as a risk factor

High levels of parental stress, tiredness, and social isolation can arise from the unique demands of raising multiple newborns. The effects of multiple births, such as high-risk pregnancy and giving birth to multiples, are both stressful life events. One of the main causes of maternal depression in multiple birth mothers has been suggested to be the stress of parenting a large number of children. Maternal depression has a well-established detrimental effect on the health and development of children, and children of multiple births may be more susceptible to developmental delays as a result of low birth weight, preterm, and inefficient use of health services brought on by maternal depression. In population-based data, mothers of multiple deliveries had a 43 percent greater risk of experiencing moderate/severe, 9-month postpartum depressive symptoms compared to mothers of singletons. Pediatric practices should make an extra effort to educate new and prospective parents with multiple infants about the elevated risk of maternal postpartum depression.

Furthermore, pediatric well-child visits have the potential to be useful opportunities for postpartum depression education, screening, and referrals for mothers of multiple births. (Choi et al., 2009)

2.4. Pregnancy, perinatal and postpartum complications as a risk factor

Specific prenatal, perinatal, and postpartum problems, such as gestational hypertension and/or preeclampsia, sleep loss and snoring throughout pregnancy, unfavorable early nursing experiences, and breastfeeding termination, were linked to PPD symptomatology at 8 weeks postpartum. (Koutra et al., 2018)

A comprehensive study and meta-analysis found that preterm delivery was associated with an increased risk of postpartum depression. Additionally, a prospective cohort study found a connection between PPD and duration of pregnancy. This could be associated with mother's biological vulnerability to unexpected hormonal and homeostatic changes during premature labor. (Dubey et al., 2021)

2.5. Lifestyle as a risk factor

A healthy diet, sleep patterns, physical activity, and exercise are lifestyle choices that can impact postpartum depression. Consuming enough fruits, vegetables, fish, milk, dairy products, olive oil, and a variety of nutritious foods has been shown to reduce the risk of developing postpartum depression by as much as 50%. Increased consumption of seafood and fish oil, which contains a high amount of docosahexaenoic acid, has been shown to greatly reduce the chance of developing PPD.

Tryptophan is converted to serotonin with the help of vitamin B6 as a cofactor. Postpartum depression may therefore be triggered by a decreased level of this vitamin. One

study found a link between postpartum depression at the 21st week of pregnancy and the degree of vitamin B2 absorption.

A higher incidence of postpartum depression has been linked to decreased intake of mictonutrients including zinc and selenium. One study suggests that zinc works as an antidepressant by changing the way serotonin is reabsorbed. Zinc is abundant in red meat, grains, pork, and shellfish. Thyroid dysfunction brought on by selenium deficiency may be a contributing factor to postpartum depression.

Depression is caused by a number of factors, including sleep quality and nutritional state. There is proof that postpartum depression and sleep deprivation are related. Additionally, a strong correlation has been shown between the degree of depression in the days after labor and the prevalence of weariness. It has been noted that depressed women may suffer from acute sleep loss after giving birth. Chronic sleep deprivation affects social interactions, quality of life, and mental health in addition to glucose metabolism and inflammatory processes. Severe sleep loss also affects the immune system and raises inflammatory markers like as tumor necrosis factor and interleukin-6, which have been linked to postpartum depression in women.

Additional research demonstrates that physical activity and exercise can reduce depressive symptoms in ways that are similar to the advantages of pharmaceuticals. It has been demonstrated that moderate exercise throughout the third trimester of pregnancy lowers postpartum depression six weeks after delivery.

The effect of exercise on women's mental health works by boosting endogenous opioids and endorphins levels , which are contributed to promoting of mental health. Exercise also boosts self-esteem and helps to reduce negative self-assesments occurring as a consequence of depression. Furthermore, exercise will assist the women to focus on their surroundings and work on their personal issues. (Ghaedrahmati et al., 2017)

Risk Factor	Interventions
Biological (genetic, hormonal) vulnerability	Antidepressant medication
Stress	Cognitive-behavioral therapy with a focus on realistic expectations, stress management, relaxation, and problem-solving skills
Insufficient social support	Interpersonal psychotherapy with a focus on negotiating for needed support Outreach (eg, by public health nurses or midwives)
Nutritional deficiencies	Nutritional education and counseling Specific supplements as indicated (eg, n-3 EFA, folate, iron)
Insufficient physical activity	Education about perinatal physical activity Support in helping a woman find and maintain realistic ways to increase physical activity
Sleep deprivation	Education about perinatal sleep hygiene Medication if needed
Breastfeeding decision support	Lactation support if a woman wants to breastfeed but is having difficulties Support for weaning if a woman is finding breastfeeding too stressful
Family planning	Proactive, noncoercive family planning counseling Psychotherapeutic support of assertiveness and effective communication with partner if needed

Figure 2. Risk factors and preventive interventions for postpartum depression (Miller and LaRusso, 2011)

3. Treatment

Once the condition is diagnosed, the physician should inform the patient and the family about the disease, rule out organic causes, initiate pharmacotherapy as well as supportive therapy, and review the patient's function and safety status on a regular basis. Physicians will make a significant contribution by informing patients and their families about the disease's symptoms, treatments, predicted results, and prevention strategies. Psychoeducation process is essential to enhance the therapeutic alliance and the patient's decision-making process concerning treatment, as well as her emotions of self-efficacy and mastery over disease. (Sit et al., 2006)

The liver of the infant, which is still immature even in full-term humans, produces the enzymes needed to metabolize drugs. Other factors include hydration and immature renal function. Every physiological system is impacted by the infant's age. The functions of premature babies are poorly developed. Older infants are better at metabolizing and excreting medications. The antidepressant's half-life may potentially influence the drug level in the infant. Thus, due to short half-lives of the selective serotonin reuptake inhibitors (SSRIs) sertraline or paroxetine these drugs are considered suitable for initial pharmacological therapy for breastfeeding mothers with concern that the different antidepressants were not efficient in the past. (O'Hara et al., 2018)

3.1 Non – pharmacological treatment

Many postpartum mothers are hesitant to take antidepressants due to concerns about infant exposure to medication through breast milk or potential adverse effects, and hence choose psychological therapy. Non-pharmacological treatment may be an option in some circumstances, and women with postpartum depression prefer non-pharmacological treatment over medication. It has also been demonstrated that women in the postpartum period obtain less psychotropic drug prescriptions than non-breastfeeding women, yet while psychotherapy is beneficial in the treatment of postpartum depression, it is not widely accessible. As a result, there is a risk of women without antidepressant treatment to be inadequately treated for their condition. (Bergle&Spigset, 2011)

Existing research supports the use of psychosocial interventions like nondirective counseling as well as psychological treatments like interpersonal therapy, cognitive-behavioral therapy, and psychodynamic psychotherapy, despite the paucity of systematic studies on nonpharmacologic treatments for PPD.

Women usually prefer psychological treatments for PPD because they reduce the risks of pharmaceutical exposure while alleviating the symptoms of depression. Psychotherapy and other psychosocial therapies have been shown in studies to help lessen the symptoms of PPD. It has been demonstrated that supportive interventions such as spousal support, health visitor counseling, cognitive behavioral therapy, psychodynamic psychotherapy, and phone-based peer support are more successful than wait-list or standard care controls.

Other nonpharmacologic methods investigated in the treatment of PPD include bright light therapy, acupuncture, massage, omega-3 fatty acid supplementation and exercise. There is limited data on the efficacy of these modalities in lowering maternal depression symptoms, although these interventions are being investigated. (Rai et al., 2015)

In obsessive- compulsive disorder, psychoeducation should be an integral part of the treatment plan. The focus of psychoeducation should be on imparting information about the disorder and psychiatric comorbidities, reducing feelings of blame and guilt, providing a rationale for treatment and promoting treatment adherence. Incorporating a cognitive-behavioral prevention program into childbirth education classes also appears effective in reducing the obsessive–compulsive symptoms in the postpartum period (Sharma, 2015).

3.2 .Pharmacological treatment

3.2.1 Lithium

Lithium is an important treatment option for the prevention and treatment of PP and a standard treatment for bipolar disorder, particulary manic episodes. (Larchmt, 2011).
Lithium treatment can minimize the incidence of relapse throughout pregnancy and the postpartum period, but its usage is limited due to teratogenicity and perinatal complications, such as congenital cardiac malformations. (Albertini et al., 2019)

Monitoring of lithium levels, thyroid and renal function, and adequate hydration is mandatory during the use of lithium (Indian J Psychiatry, 2015). Five days after beginning treatment, drug levels and kidney tests should be reevaluated. Lithium levels should be checked every 6 to 12 months following stability, with a target level of 0.4 to 1.0 mEq/L at 12 hours after the dose. Doctors should keep an eye out for side effects such nausea, vomiting, weight gain, tremor, sleepiness, and renal failure. Serum levels that are hazardous and therapeutic differ very little. Patients should avoid thiazides, nonsteroidal anti-inflammatory medications, and angiotensin-converting enzyme inhibitors because they alter fluid balance and interfere with the kidneys' ability to excrete lithium. Women who suffer from dehydration or illnesses that cause their salt levels to drop are more vulnerable to lithium poisoning. Lithium poisoning in women manifests as excessive sedation, severe tremors, sudden renal failure, and intractable vomiting. Toxicology is indicated by elevated drug levels.

Lithium toxicity must be treated quickly by discontinuing the medicine, rehydrating with fluids, and closely monitoring electrolyte balance and renal function. (Larchmt, 2011).

It is recommended to either avoid lactating altogether or adjust the disorder's treatment for breastfeeding. Some adverse consequences, including thyroid issues, hypothermia, and hypotonia, have been linked to the administration of lithium during lactation. The amount of lithium in the mother's serum ranges from 0% to 50%, and it is eliminated in the breastfeeding. After about a week, it is advised to see a pediatrician to frequently monitor and evaluate the exposed infant's blood lithium level, thyroid function, renal function, and other factors including weight increase, tremor, and attentiveness.

Depending on the newborn's blood lithium level after a week of full breastfeeding, the baby may be monitored every four weeks as long as it is being nursed. If the mother's lithium level stays constant and the newborn grows properly, the test might not need to be repeated if the newborn's lithium level is less than 0.1 mmol/L during the initial test. Breastmilk, on the other hand, is the healthiest food for babies during the first year of life and has many positive health impacts on both mothers and children. The possible risks of lithium exposure must be weighed against this.

Furthermore, it has been repeatedly demonstrated that the postpartum time is a very vulnerable period for relapse in bipolar women. Continuing mood-stabilizing medication with lithium may significantly minimize the likelihood of postpartum recurrence. (Gehrmann et al.,2021)

3.2.2 Selective serotonin reuptake inhibitors

Postpartum depression symptoms improved after receiving treatment with selective serotonin reuptake inhibitors (SSRIs), such as sertraline, fluvoxamine, and fluoxetine. Because of their relative safety in the event of an overdose, SSRIs are frequently used and are currently regarded as first-line therapy in the treatment of postpartum depression.

The SSRI class of medications is also indicated for the treatment of postpartum dysthymia, panic disorder, obsessive-compulsive disorder and anxiety due to their low toxicity. Furthermore, the serotonin noradrenaline reuptake inhibitor (SNRI) venlafaxine has been shown to decrease postpartum depression symptoms. (Bergle&Spigset, 2011)

Besides from the primary function of selective inhibition of serotonergic reuptake, several selective serotonin reuptake inhibitors inhibit noradrenergic and dopaminergic reuptake, antagonize serotonin 2C, muscarinic, and sigma 1 receptors, as well as inhibit nitric oxide generation and other cytochrome P450 enzymes. Adverse effects may occur during the early days of treatment as a result of rapidly raised serotonin levels in specific parts of the body. The most common side effects include nausea, diarrhea, vomiting, difficulties in sleeping, and reduced sex drive. (Fitelson et al., 2010) Usually minor, these effects go away when postsynaptic receptors become desensitized.

The SSRIs' therapeutically active S-stereoisomer (enantiomer), escitalopram, is well-known for its highly selective inhibition of serotonin reuptake. The half-life of the SSRI fluoxetine is lengthy; it can last anywhere from one to three days after a single dose and four to six days after prolonged use. Its active metabolite, norfluoxetine, has a half-life of up to 16 days. Fluoxetine is more likely than other SSRIs to produce measurable levels in breast milk and baby serum due to its pharmacokinetic characteristics. Additionally, prenatal loading brought on by in utero exposure may raise postnatal infant blood levels.

Fluvoxamine has no active metabolites and has the shortest half-life of any SSRI at 15.6 hours. (Lanza di Scalea&Wisner, 2009).

3.2.2.1 Sertialine

Major depression, obsessive-compulsive disorder, panic disorder, post-traumatic stress disorder, premenstrual dysphoric disorder, and social anxiety disorder are all treated with sertraline, an antidepressant medication. It is a member of the SSRI class of drugs. The main way that sertraline, an antidepressant, acts is by preventing presynaptic serotonin reuptake. Because serotonin reuptake is suppressed, serotonin builds up. Blocking serotonin reuptake is useful in treating conditions like major depression because serotonin in the central nervous system controls mood, personality, and attentiveness. Studies have shown that sertraline has stronger dopaminergic activity than other SSRIs, and it also has minimal effects on norepinephrine and dopamine absorption. Because of the way it works, sertraline is very successful at treating a wide range of mental health conditions.

Sertraline is taken orally once a day, either the morning or evening. If sertraline causes somnolence in the patient, it should be administered in the evening. Sertraline absorption may be enhanced when taken with meals. According to the FDA, 50 mg once daily is the recommended first dosage for major depressive disorder and obsessive-compulsive disorder. The maintenance dosage for obsessive-compulsive disorder and depression is 50–200 mg taken once daily. Weekly dose adjustments may be made based on the clinical response.

Withdrawal of serotonergic antidepressants may result in undesirable effects, especially if the discontinuation is sudden. The symptoms include nausea, diaphoresis, dysphoric mood, agitation, vertigo, tremor, anxiety, disorientation, cephalgia, lethargy, emotional lability, sleep disturbance, hypomania, tinnitus, seizures, and sensory problems (such as paresthesia or electric shock experiences). Therefore, it is advised to decrease the dosage gradually rather than suddenly whenever feasible.

Monoamine oxidase inhibitors and tricyclic antidepressants are less well tolerated than SSRIs, a more recent class of antidepressants. Syncope, lightheadedness, diarrhea, nausea, sweating, dizziness, xerostomia, disorientation, hallucinations, tremor, somnolence, impotence, ejaculation disorder, lethargy, rhinitis, and female sexual disorder are among the most frequent side effects of sertraline. Because sertraline prevents platelets from aggregating, it can result in bleeding. The QT interval can be prolonged by sertraline, however the prolongation is rather mild and dose-dependent. In rare instances, it could result in serotonin syndrome symptoms; however, this is more likely to happen when used with another serotonergic medication. The symptoms include myoclonus, agitated delirium, muscle rigidity, diaphoresis, tremor, hyperreflexia, and hyperthermia.

Because of its low levels in breast milk, short half-life, frequently undetectable in infants serum concentration, and little risk of central nervous system effects, sertraline is regarded as safe to use during pregnancy and lactation. Although the weakly active metabolite norsertraline (desmethylsertraline) is frequently found in low quantities in newborn serum, the amount of sertialine that an infant consumes is minimal and is not identified in their serum. In rare instances, preterm infants with decreased metabolic activity may store the drug and show signs resembling neonatal abstinence. Most expert reviewers believe that sertraline is the best antidepressant to take while nursing.

Although therapeutic drug monitoring is not required, it may be considered to protect the safety of pregnant patients and newborns who may have been exposed to the medication. When treating pregnant women with sertraline during the third trimester, the physician should consider risk-benefit analysis when reducing sertraline in the third trimester. (Singh et al., 2022)

3.2.2.2 Paroxetine

Paroxetine is a highly effective and selective serotonin reuptake inhibitor (SSRI) approved for the treatment of various conditions, including depression, obsessive-compulsive disorder, panic disorder, and social anxiety. It is also utilized to manage generalized anxiety disorder, post-traumatic stress disorder, premenstrual dysphoric disorder, diabetic neuropathy, vasovagal syncope, and chronic headaches.

This medication belongs to a class of drugs that, despite structural differences, enhance serotonergic transmission by blocking the presynaptic transport mechanism responsible for

serotonin reuptake. This action increases serotonergic activity at the postsynaptic receptors. As a phenylpiperidine derivative, paroxetine is recognized as the most potent inhibitor of 5-HT reuptake among available antidepressants. Although it exhibits weak inhibition of norepinephrine reuptake, its efficacy in this regard may surpass that of other SSRIs, particularly at higher doses. Paroxetine demonstrates the highest selectivity among SSRIs, as indicated by its norepinephrine to serotonin uptake inhibition ratio (NE/5-HT). It shows low affinity for catecholaminergic, dopaminergic, and histaminergic systems, resulting in a lower likelihood of causing central and autonomic side effects compared to tricyclic antidepressants (TCAs). While paroxetine does have some affinity for the muscarinic cholinergic receptor, this is significantly less than that of TCAs, and it also inhibits nitric oxide synthase. Additionally, it functions as both a substrate and an inhibitor of the cytochrome isoenzyme P450 2D6. Paroxetine is well absorbed when taken orally and undergoes a prolonged, partially saturable first-pass metabolism.

Although the inhibition of serotonin reuptake begins within hours of ingestion, the clinical effects for psychiatric conditions, such as depression, are often delayed, typically requiring two weeks or longer for a significant response. This delay may be attributed to the time needed for the drug to initiate its full effects through a series of biochemical reactions following administration.

Due to the low concentrations of paroxetine found in breast milk, the amount ingested by infants is minimal, and it is generally undetectable in the serum of most tested infants. Occasionally, mild side effects have been reported, particularly among infants whose mothers took paroxetine during the third trimester of pregnancy; however, the precise impact of the drug in breast milk remains uncertain.

Most authoritative reviewers rank paroxetine as one of the best antidepressants for breastfeeding mothers. In breastfed newborns, modest adverse effects such as sleeplessness, restlessness, and increased crying have been occasionally reported. (Bourin et al., 2001)

3.2.2.3 Fluvoxamine

Based on the limited available data, maternal doses of fluvoxamine up to 300 mg per day result in only minimal concentrations of the drug in breast milk, which are unlikely to adversely affect breastfed infants, especially those older than two months. Therefore, mothers taking fluvoxamine can continue breastfeeding with confidence. Safety evaluations indicate that fluvoxamine is considered safe during lactation. Additionally, some long-term studies on the growth and development of breastfed infants have demonstrated no negative effects. However, it is advisable to monitor infants exposed to fluvoxamine through breast milk for any potential symptoms, such as diarrhea, vomiting, decreased sleep, or increased irritability.

The most evidence-based drugs for usage during nursing include sertraline and paroxetine (SSRIs) and nortriptyline and imipramine (TCAs). (Lanza di Scalea&Wisner, 2009).

3.2.3 Noradrenergic and specific serotonergic antidepressants

Noradrenergic and specific serotonergic antidepressants (NaSSAs) are the most sedating antidepressants and include drugs like mirtazapine. (CAMH, 2018) Therapeutic mechanism of mirtazapine works by blocking presynaptic a-2 adrenergic receptors which normally inhibit the release of serotonin and noradrenaline. Its half-life is 37 hours. (Lanza di

Scalea&Wisner, 2009) This class of antidepressants is usually prescribed to patients who experience severe anxiety or insomnia, but it can also be used for appetite stimulation. The common side effects of noradrenergic and specific serotogenic antidepressants include drowsiness and weight gain. (CAMH, 2018)

3.2.4 Norepinephrine and dopamine reuptake inhibitors

Norepinephrine and dopamine reuptake inhibitors (NDRIs) include medications like bupropion. (CAMH, 2018) Bupropion acts as a norepinephrine and dopamine reuptake inhibitor as well as a nicotinic antagonist. Its half-life is 20 hours and it is converted into multiple active metabolites, the most potent of which is 6-hydroxy-bupropion. Bupropion is often used as an augmentation strategy to selective serotonin reuptake inhibitors or selective noradrenaline reuptake inhibitors. Bupropion does not cause sexual dysfunction and weight gain. (Lanza di Scalea&Wisner, 2009)

NDRIs typically have the ability to treat depression in conjunction with other antidepressants and provides the patient with more energy. Some side effects of NDRIs are insomnia and jittery behaviour. NDRIs can also be used to treat ADD/ADHD and help patients who smoke to quit (CAMH, 2018).

3.2.5 Tricyclic antidepressants

Tricyclic antidepressants are older class of antidepressants which includes maprotiline, amitriptyline, and imipramine. Because of the higher number of side effects due to their multiple receptor impacts in contrast to the other classes of antidepressants, they are typically not the first class of antidepressants prescribed by a physician. Constipation, sedation, blurry vision, weight gain, dizziness, difficulties in urinatioon, and tremors are some of the side effects (CAMH, 2018). TCAs may be associated with cardiac toxicity and may cause heart arrhythmias, which is why physicians are advised to perform an electrocardiogram (ECG) prior to initiation this specific drug treatment (CAMH, 2018). However, cyclics may be helpful if patients are not relieved from severe depression with other types of antidepressants. (CAMH, 2018)

Tricyclic and heterocyclic antidepressants work by preventing norepinephrine, dopamine, and serotonin from being reabsorbed; the degree of blockade varies depending on the medicine. NTP and imipramine, which are infrequently identified and have not been connected to detrimental clinical outcomes, are present in the majority of the reported tricyclic antidepressant newborn blood level data. Doxepin, a sedative with a lengthy half-life metabolite, is generally regarded as contraindicated since it has been connected to respiratory depression and drowsiness. TCAs can be regarded first-line therapy for women with PPD when the mother has been effectively treated for previous episodes and there are no present contraindications, such as suicidality. (Lanza di Scalea&Wisner, 2009)

3.2.6 Hormonal therapy

During pregnancy and postpartum period, there is a significant drop in maternal hormone levels. A significant change in levels of estrogen and progesterone occurs at the time of delivery, and this has been considered to potentially trigger the onset of postpartum depression in women. (Moses-Kolko et al., 2009) There is a hypothesis that estradiol, a

synthetic form of naturally occurring estrogen, may be potentially used as a homone therapy for postpartum depression treatment, due to the fact that there is similarity of its action to other psychotropic medications. (Bloch et al., 2000) The impact of estrogen on the brain includes the promotion of neuronal growth and maintenance, a reduction in oxidative stress, enhancements in neurotransmitter function, and regulation of the hypothalamic-pituitary axis. However, hormone therapy is linked to certain side effects that can occur with prolonged use. These potential side effects may include difficulties with lactation, an elevated risk of endometrial cancer, and endometrial hyperplasia, which is characterized by the excessive proliferation of cells in the endometrium. The contraindications for estrogen therapy include the elevated risk of thromboembolism in women (Fitelson et al., 2010).

A study published in the American Journal of Psychiatry in 2000 revealed that women with a history of postpartum depression experienced mood symptoms when exposed to lower levels of estradiol (an estrogen steroid hormone) and progesterone during childbirth. In contrast, women without such a history did not exhibit these mood symptoms. These findings suggest that a subset of the population may be particularly sensitive to hormonal fluctuations, indicating that hormonal interventions could potentially serve as effective treatments or preventative measures for postpartum depression.

Despite the high effectiveness of more conventional pharmacological antidepressant treatment, this natural alternative may be preffered over drugs, especially in breastfeeding mothers, however, the experimental nature of hormonal therapy leads to consideration different treatment options, such as psychological treatment. (Bloch et al., 2000).

Conclusion

Mental health issues arising during the postpartum phase are among the most common complications associated with childbirth. If left untreated, these conditions can manifest in five primary forms: postpartum blues, postpartum depression, postpartum psychosis, postpartum post-traumatic stress disorder, and postpartum anxiety, including obsessive-compulsive disorder. Untreated, these disorders can significantly impact both the mother and child's well-being, adversely affecting the child's cognitive, emotional, and behavioral development, potentially leading to long-lasting repercussions for both. Therefore, early diagnosis is essential for initiating effective treatment.

Treatment options for psychiatric disorders during the postpartum period include psychotherapy, hormonal therapy, and pharmacotherapy, particularly for those with more severe symptoms. Mothers concerned about the safety of antidepressants while breastfeeding often prefer psychotherapy methods such as interpersonal therapy, cognitive-behavioral therapy, and nondirective counseling, although these approaches are generally viewed as less effective than medication. While all medications can pass into breast milk, the extent of this transfer varies by drug. Currently, sertraline, paroxetine, and nortriptyline are considered the safest options for breastfeeding infants. Alternative treatments for postpartum depression include bright light therapy, electroconvulsive therapy, and omega-3 fatty acid supplementation.

Despite the increasing awareness of postpartum depression (PPD), significant stigma still deters some women from seeking treatment. For those who do reach out for help, access to providers with specialized knowledge in prenatal mental health can be limited, particularly in developing countries where mental health issues are often overlooked. To address this gap,

reproductive psychiatric training should be expanded within residency programs, and support groups should be established within the psychiatric field. Managing peripartum psychiatric disorders is complex and requires collaboration among various specialists, including obstetricians, pediatricians, psychiatrists, and nurses or midwives.

In preparing this work, the authors used OpenAI for the purpose of language improvement, basic data analysis and verification of bibliography. After using this service, the authors have reviewed and edited the content as needed and accept full responsibility for the substantive content of the publication.

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