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# Postpartum Depression: An Overview

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## Abstract

Postpartum depression is classified under Diagnostic and Statistical Manual of mental disorders -IV (DSM-IV) as a postpartum affective disorder and major common complication in child bearing women. It causes irritable severely depressed mood that occurs within 4 weeks after giving birth and possibly persist up to 30 weeks. Childbirth is a life changing event and up to 85% of the people experience mood disturbances and nearly 10-15 % mothers experience persistent symptoms that lead to depressive episode. It is often unrecognized and untreated. Untreated maternal depression can have negative effect on child development, mother infant bonding and risk of anxiety or depression symptoms in infants later life. Manifestations include crying spells, depressed mood, insomnia, fatigue, and anxiety. Screening for postpartum depression can be done using Edinburgh postpartum depression scale, antepartum questionnaire. Treatment should begin with psychotherapy and advanced to pharmacotherapy if needed.

**Keywords:** Women, postpartum, estrogen. pregnancy, psychotherapy, depression, tryptophan.

## Introduction

Postpartum depression (PPD) is a complex and challenging disorder that often takes a woman and her family by surprise and cause devastation and dissension in women's life [1]. PPD is a subtype of major depressive disorder and is defined as depression episode that occurs within the first 4 - 6 weeks after delivery [2]. The consequences of depression during postpartum are deleterious because women faces the added responsibility of caring for her newborn. The partners role and stable marital status becomes crucial if the mother is afflicted with PPD [1].

## Epidemiology

The epidemiological studies have yielded varying prevalence rates ranging from 3 % to more than 25 % of women in the first year following delivery. These rates fluctuate due to sampling, timing of assessment, differing diagnostic criteria and affects approximately 10 – 15 % of adult mothers yearly with depressive symptoms lasting more than 6 months among 25 – 50 % of those affected [3-4]. Although it may resolve spontaneously within weeks after its onset, approximately 20 % of women still have depression beyond the 1st year, 13 % after 2 years and 40 % will have relapse after delivery [5].

**Etiology:**

The etiology is poorly understood but is likely to involve an interaction between psychological, social, hormonal, life style, obstetric, genetical and biological factors [6]. Interestingly reported that high expression of serotonin genotypes may be a cause for PPD if associated with tryptophan depletion after childbirth [2].

The following factors may contribute to PPD [7]:

- Previous history of depression
- Changes in sleep cycle
- Single marital status
- Physical changes of pregnancy
- Lack of family support
- Worries about relationships
- Financial difficulties
- Low self esteem
- Worry about the baby and responsibilities of being a parent

**Signs and Symptoms**

In the 1st day to weeks after childbirth, new mother goes through a variety of emotions and experience difficult feelings, including sadness. Sadness and crying bouts that follow childbirth are known as the " baby blues " and tend to pass quickly but PPD can be long lasting [8]. Symptoms of postpartum depression may be similar to those of major depression and may include [9]:

- Extreme sadness, uncontrolled crying
- Guilt, insomnia or increased sleep
- Loss of appetite, irritability or anger
- Extreme Fatigue and headache
- Suicidal thoughts, anxiety and fear of harming the baby
- Weight loss or weight gain
- Feeling distant and withdrawn from family and friends

**Diagnosis**

About 50 % of cases of PPD remain undiagnosed and 20 % untreated and to meet the diagnostic criteria, depression symptoms must be continuously present at least 2 weeks and interfere with the individuals everyday functioning [10,11].

Diagnosis can be done by following methods [9,12]:

- Clinical evaluation
- Depression scales

Clinical evaluation: There is no test that definitively indicates that someone has PPD so the health care providers diagnose this disorder by gathering comprehensive medical, family and mental health history.

PPD should be suspected if women has the following:

- Symptoms of depression for >2 weeks
- Symptoms that interfere with daily activities
- Suicidal or homicidal thoughts
- Hallucinations, delusions or psychotic behavior

Depression scales [13]:

- Edinburgh Postnatal Depression Scale (EPDS)
- Antepartum questionnaire (APQ)
- Montgomery-Asberg Depression Rating Scale (MADRS)
- Hamilton Rating Scale for Depression (HRSD)
- Beck Depression Inventory (BDI)

**Overview About Screening Scales [13,14]**

| | EPDS | APQ | MADRS | BDI | HRSD |
|---|---|---|---|---|---|
| Items | 10 | 9 | 10 | 21 | 31 |
| Range of scores | 0-30 | 0-27 | 0-60 | 0-63 | 0-50 |
| Diagnostic cut point | 9/10 | 10 | 11 | 15/16 | 15 and above |
| Minutes to complete | 5 | 5 | 15-20 | 5-10 | 20 |
| Diagnostic Item characteristics | Differentiate symptoms from pregnancy/ postpartum, includes anxiety items for PPD. | DSM-IV criteria, no anxiety items for major depressive disorder. | Helps to assess psychological symptoms and social functioning. | Helps to assess the cognitive symptoms, behavior, somatic complaints and interpersonal domains to measure the presence and intensity of depressive symptoms. | Helps to assess the severity of depression. |

**Pathophysiology**

Although many biological and physiologic theories exist, there is a little evidence to support them. Other epidemiologic studies have supported that psychological factors play a significant role in the etiology of PPD. Therefore women with a history of depression, premenstrual mood disorders, marital conflict, poor social relationships and stressful life events are at greater risk for developing PPD [15].

Potential mechanisms include: [16]

**1. Role of tryptophan metabolites**

Tryptophan is the main precursor for the production of melatonin & serotonin and it is metabolized by tryptophan hydroxylase 2 enzyme. Due to the polymorphism in the serotonin rate limiting enzyme (tryptophan hydroxylase 2) leads to decreased production of melatonin, serotonin and increased tryptophan metabolites [kynurenine (kyn), kynurenic acid (KYNA), quinolic acid (QUIN) ] causing depression during pregnancy as well as postnatally. Nearly 60 % of peripheral Kyn is transported to BBB and converted to KYNA by astrocytes and then to quinolinic acid (QUIN) by microglia. KYNA inhibits alpha 7 nicotinic acetylcholine receptor, acetyl choline and dopamine levels in the cortex, contributing to decreased cortex activity, cognition and behavior.

**2. Immuno- inflammatory pathway**

A number of immuno-inflammatory changes are associated with the puerperium, correlating to postpartum mood and anxiety. Immune activation in the early puerperium, leads to increased IL-6, IL-1 receptor antagonist and leukemia inhibitory factor receptor, as well as decreased anti-inflammatory Clara cell protein causes postpartrum depressive symptoms.

**3. Autoimmunity**

Autoimmunity is associated with depression including serotonin autoimmunity and thyroid autoimmunity, elevations in thyroid stimulating hormone, linked to thyroid autoimmunity, this would link to the decreased thyroid hormone, evident in PPD, where it negatively correlates with PPD severity. Serotonin autoimmunity is associated with increased physiosomatic symptoms, including malaise and neurocognitive symptoms, as well as increased serum neopterin and lysozyme, coupled to increased plasma TNF-á and IL-1 in comparison with depressed patients without 5-hydroxytryptamine (5-HT) autoimmunity. This emphasizes the importance that immuno-inflammatory pathways have in the onset of 5-HT autoimmunity. Fatigue is common in PPD, which like malaise is associated with autoimmune activity.

**4. Role of Hormones**

Within 48 hours of parturition, maternal levels of cortisol, estrogen, progesterone, and neurosteroids fall dramatically, which has been suggested to contribute to PPD. However, other work suggests that hormonal changes are not the major determinant of PPD, although a decrease in allopregnanolone is correlated with decreased mood in the " baby blues " period postnatally. In the third trimester, plasma oxytocin concentration negatively

correlates with the postpartum score on the Edinburgh Postnatal Depression Scale, so increase in oxytocin during pregnancy may decrease PPD. Oxytocin has a significant role in preparing the mother for the process of delivery as well as for lactation and maternal behavioural adaptations, including emotional attachment to the new born, are often challenged in PPD, resulting in offspring with higher levels of insecure attachment, driving subsequent behavioural and mood problems, so decreased oxytocin in adults is also linked to increased anxiety and depression.

**Treatment**

Depending on the severity of symptoms, the treatment time and method will vary. There are several ways of dealing with postpartum depression such as psychotherapy, counselling, medications. If symptoms resolve spontaneously, supportive reassurance is the limit of usual therapy and medications are not advisable [17].

- 1st line: Psychotherapy
- 2ndline: Pharmacotherapy

**Psychotherapy [17]**

It is considered to be one of the most effective therapy modes for treating PPD and involves sharing concerns with a psychiatrist. The mental health providers suggest ways to cope up with depression. So one can find better ways to solve problems, control mood swings, set realistic goals and respond to situation in a positive way.

**Counselling**

Counselling is a way of treating depression by direct interaction between the affected individual and psychiatrist. Two methods of therapy that have been shown to be beneficial are :

- Cognitive behavioral therapy
- Interpersonal therapy

Cognitive behavioral therapy (CBT) [12,17,18]:

This approach to therapy is more beneficial if anxiety is an strong component of symptom and is focused on changing the way patient thinks. CBT breaks down the problem into smaller and transform negative thoughts in to positive ones and designed to provide practical solutions to improve thought process on daily basis.

The therapist uses 3 techniques to accomplish these goals:

- Didactic component: This phase helps to set up positive expectations for therapy and promote cooperation.
- Cognitive component: This helps to identify thoughts and assumptions that influence behavior.
- Behavioral component: This helps the individual with PPD more effective strategies for dealing with problems.

**Inter Personal Therapy (IPT)**

It is a direct interaction between the therapist and the patient, where the therapist focus on four key problem areas of the patient, namely grief, role transitions, interpersonal disputes and inter personal deficits.

Pharmacotherapy [17]

**I. Antidepressants:** A Selective Serotonin Reuptake Inhibitor should be tried initially because such agents are associated with a low risk of toxic effects in postpartum women. The mechanism of SSRIs is linked to a potentiation of serotogenic activity in the CNS resulting from their inhibition of neuronal reuptake of serotonin and a conservative therapy would be 5 to 6 months.

Sertraline: 50 to 200 mg, 0D

Paroxetine: 20 to 60 mg, OD

Fluoxetine: 20 to 60 mg, OD

Citalopram: 20 to 40 mg, OD

Fluvoxamine: 50 to 200 mg, OD

Tricyclic antidepressants: frequency up to 2 to 3 months

Nortriptyline: 50 to 150 mg, BID

Desipramine: 100 to 300 mg, BID/TID

Amitriptyline: 25 to 75 mg, BID

Serotonin Nor epinephrine Reuptake Inhibitor: frequency up to 4 to 6 weeks

Venlafaxine: 75 to 300 mg, OD

Mono Amine Oxidase Inhibitors: frequency up to 4 to 6 weeks

Moclobemide: 300 mg, BID/TID

Phenelzine: 50 mg, TID

Nefazodone: 300 to 600 mg, OD

Combined Treatment

A combination of psychotherapy and antidepressants is often more efficacious than alone in the treatment of adult depression.

**Other Biological Treatments**

A decrease in zinc, thiamine and magnesium is seen in case of depression, aggression, confusion and memory impairment, so by administration of zinc, magnesium, and thiamine improved depression and anxiety. Estrogen has been proposed as an antidepressant, including for use in PPD, where it would increase oxytocin levels. The use of combinations of estrogen and SSRIs requires careful investigation. Possible adjunctive use of testosterone has also been proposed. Such hormonal treatment is thought to be more beneficial in women with a history of premenstrual depression.

**Melatonin and melatonergic medications**

Melatonin is a powerful antioxidant, anti-inflammatory, and antinociceptive, and increases mitochondrial oxidative phosphorylation, being generally free of side effects. There is growing appreciation of melatonin's antidepressant action, leading to the development of melatonergic-based pharmaceuticals, including AGOMELATINE (a melatonin MT1r and MT2r agonist and serotonin 2Cr antagonist) and RAMELTEON (MT1/2r agonist), although melatonin itself may prove a more effective and safer option. Certainly, the deregulation in the circadian rhythm and sleep pattern that is common in PPD would be improved.

**Role Of Pharmacist: [17,19,20,21,22]**

PPD is often underreported because many women dismiss their symptoms as a normal result of childbirth and is imperative for physicians to proactively screen women for PPD soon after delivery to identify depressive symptoms and initiate treatment before the disorder progresses. Pharmacists also can play an active role by making sure that at-risk women who approach them receive appropriate help whether by recognizing symptoms that may warrant referral to their physician, providing valuable drug information to a woman starting a new medication for PPD (i.e., when to expect relief, potential side effects), or offering assurance and support, pharmacists can contribute significantly to the early detection and treatment of this common and curable disorder [17].

**Lifestyle modifications**

- Nutrition plays important role in hormonal regulation, gut health, immunity & neuro endocrine functioning and it is essential to take enough Vitamin D & vitamin B essential fatty acids, including eicosapentaenoic acid, docosapentaenoic acid (EPA/DHA) [19].
- Postpartum women also have increased nutrient demands, especially due to healing, recovery and breast-feeding. Nutrient–rich foods such as fruits (bananas, berries, citrus fruits, cranberries, guava, kiwi, papaya, pineapple),vegetables (broccoli, spinach sweet potato carrots, bell-peppers, avocado etc) . Whole grains must be added to their diet [20].
- Protein including poultry, seafood, eggs, yogurt, cheese, beans, nuts & seeds including almonds flax

seeds, walnuts, pumpkin seeds, sunflower seeds are required for postpartum women [21].

- Healthy fats like olive oil, hemp/chia seeds, grass-fed butter, avocado, coconut & fatty fishes like salmon are also helpful [21].
- Exercise including, jogging at a moderate pace, yoga, gardening reduces stress, boost-self-esteem, improve sleep and helps to reduce body fat & makes fit & healthy [23].

**Conclusion**

Postpartum depression has a significant adverse impact, not just on the affected woman but also on partner and the family as a whole. These depressive feelings might be reinforced by others, who dismiss postpartum depression by saying that the mother should be happy to have a child or that she is just being selfish or self-indulgent. However postpartum depression is a real condition that should be treated seriously, affecting women of all backgrounds. Therefore, psychotherapy plays key role and other treatment strategies using melatonin, antidepressants, combination therapy are just some of the ways that it can be successfully treated.

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