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Dolna 17, Warsaw,
Poland 00-773
+48 226 0 227 03
editorial_office@rsglobal.pl

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THE IMPACT OF VITAMIN B6 ON PREVENTING POSTPARTUM DEPRESSION

Magdalena Próchnicka *(Corresponding Author, Email: maadiii1210@gmail.com)*
University Clinical Hospital No. 4 in Lublin, ul. Doktora Kazimierza Jaczewskiego 8, 20-090 Lublin, Poland
ORCID ID:0000-0002-0641-2079

Dominika Nowak
University Clinical Hospital No. 4 in Lublin, ul. Doktora Kazimierza Jaczewskiego 8, 20-090 Lublin, Poland
ORCID ID:0000-0002-0195-1102

Michał Siwek
University Clinical Hospital No. 4 in Lublin, ul. Doktora Kazimierza Jaczewskiego 8, 20-090 Lublin, Poland
ORCID ID:0000-0002-0930-9333

Adam Zarzycki
University Clinical Hospital No. 4 in Lublin, ul. Doktora Kazimierza Jaczewskiego 8, 20-090 Lublin, Poland
ORCID ID:0009-0004-9589-1842

Jan Noskowicz
Independent Public Healthcare Institution of the Ministry of Internal Affairs and Administration named after Sergeant Grzegorz Załoga in Katowice, ul. Wita Stwosza 39/41, 40-042 Katowice, Poland
ORCID ID:0009-0009-6578-0398

Jan Urban
Independent Public Healthcare Institution of the Ministry of Internal Affairs and Administration named after Sergeant Grzegorz Załoga in Katowice, ul. Wita Stwosza 39/41, 40-042 Katowice, Poland
ORCID ID:0009-0004-8583-6970

Jakub Hamouta
1st Military Clinical Hospital with Outpatient Clinic SPZOZ in Lublin, Raclawickie Avenue 23, 20-049 Lublin, Poland
ORCID ID:0009-0003-6368-223X

Patrycja Długosz
University Clinical Hospital No. 4 in Lublin, ul. Doktora Kazimierza Jaczewskiego 8, 20-090 Lublin, Poland
ORCID ID:0000-0003-4517-4832

Julia Konat
Provincial Specialist Hospital in Lublin, Krasnickie Avenue 100, 20-718 Lublin, Poland
ORCID ID:0009-0008-6607-6725

Wiktor Doroszuk
1st Military Clinical Hospital with Outpatient Clinic SPZOZ in Lublin, Raclawickie Avenue 23, 20-049 Lublin, Poland
ORCID ID:0009-0004-2446-726X

ABSTRACT

Introduction: Postpartum depression (PPD) is one of the most common complications of childbirth. Globally, PPD afflicts up to approximately twenty percent of women during pregnancy or after giving birth. Untreated postpartum depression can have substantial adverse effects on the well-being of the mother and child, negatively impacting child cognitive, behavioral, and emotional development with lasting consequences. The aim of this review is to summarize current evidence on vitamin's B6 role on preventing postpartum depression.
Material and methods: A PubMed literature serach was conducted using terms "vitamin B6 in postpartum depression", "postpartum mood disorders", and "vitamin B6 and pregnancy". Filters included Free Full Text, Clinical Trial, Randomized Clinical Trial, within the last 10 years.
Results: This single-blind, placebo-controlled clinical trial was conducted on 81 pregnant women who were at risk of PPD. They received 80 mg of vitamin B6 daily and placebo, respectively from the 28th week until the end of pregnancy. The risk of PPD was assessed as the main inclusion criteria using a structured clinical interview using hospital anxiety-depressive scale, social support appraisals scale, and Holmes and Rahe life change and stress evaluation questionnaire. It was found that the mean score of depression in the post-intervention group was significantly lower than that of the pre-intervention group.
Conclusions: According to the obtained results, vitamin B6 has a positive effect on reducing postpartum depression scores among mothers at risk for PPD. However, these arrangements should be seen as preliminary, until treatment is assessed in larger, multicentre studies of longer duration.

KEYWORDS

Postpartum Depression, Postpartum Mood Disorders, Vitamin B6, Pregnancy

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Postpartum depression

It is a type of mood disorder associated with childbirth, which can affect both sexes. Globally, PPD afflicts up to approximately twenty percent of women during pregnancy or after giving birth [1]. Symptoms may include extreme sadness, low energy, anxiety, crying episodes, irritability, and changes in sleeping or eating patterns. Onset is typically between one week and one month following childbirth. PPD can also negatively affect the newborn child. According to the ICD-10 classification, its symptoms must appear within 6 weeks after giving birth. Postpartum depression affects roughly 8.9-10.1% of women in high income countries and 17.8-19.7% of women in low and middle income countries [2-4].

Postpartum mood disorders

There are two other types of postpartum mood disorders: baby blues and postpartum psychosis. It is important to differentiate these conditions with postpartum depression.

The baby blues affect between 50% and 75% of people after delivery. The symptoms are prolonged bouts of crying for no apparent reason, sadness and anxiety. The condition usually begins in the first week (one to four days) after delivery. Although the experience is unpleasant, the condition usually subsides within two weeks without treatment [5,6].

Postpartum psychosis is an extremely severe form of postpartum depression and requires emergency medical attention. This condition is relatively rare, affecting only 1 in 1,000 people after delivery. The symptoms generally occur quickly after delivery and are severe, lasting for a few weeks to several months. Symptoms include severe agitation, confusion, feelings of hopelessness and shame, insomnia, paranoia, delusions or hallucinations, hyperactivity, rapid speech or mania. Postpartum psychosis requires immediate medical attention since there is an increased risk of suicide and risk of harm to the baby. Treatment will usually include hospitalization, psychotherapy and medication [7,8].

Causes of postpartum depression

The development of postpartum depression (PPD) is the result of a complex interplay of biological, psychological, and environmental factors, rather than a single, clearly defined cause. Although the precise mechanisms underlying this condition are still not fully understood, current research suggests that PPD emerges from a multifactorial process involving hormonal fluctuations, emotional vulnerability, genetic predisposition, and external stressors [9,10]. Shortly after childbirth, women experience a dramatic shift in hormone levels—particularly estrogen and progesterone—which can significantly influence brain chemistry and mood regulation. This abrupt hormonal withdrawal, combined with physical exhaustion, sleep deprivation, and the emotional demands of caring for a newborn, creates a fertile ground for mood disorders.

Certain individuals are more susceptible to developing PPD due to identifiable risk factors. These include a personal or family history of mood disorders, such as major depression or bipolar disorder, as well as previous episodes of postpartum depression. Psychological stress, socioeconomic difficulties, complications during pregnancy or childbirth, limited social support, and substance use issues can further elevate the risk. Importantly, the presence of these factors does not guarantee the development of depression, but they contribute to increased vulnerability.

From a neurological perspective, recent studies have begun to identify measurable differences in brain function and connectivity in women diagnosed with PPD. Neuroimaging data suggest that affected mothers often exhibit altered activation patterns in key brain regions involved in mood regulation, emotion processing, and decision-making. Specifically, reduced activity in the left frontal lobe—associated with positive emotional experiences—and heightened activity in the right frontal lobe—linked to negative affect—have been observed. Additionally, disruptions in neural connectivity between regions such as the anterior cingulate cortex, dorsolateral prefrontal cortex, amygdala, and hippocampus indicate that the ability to regulate emotions and respond to stress may be compromised in women with PPD [11,12].

Although transient emotional disturbances are common in the days immediately following childbirth, postpartum depression should be considered when symptoms such as persistent sadness, anxiety, hopelessness, or detachment last longer than two weeks and interfere with daily functioning. Early recognition and a nuanced understanding of its multifaceted causes are essential for effective prevention and treatment strategies.

Diagnosis

Early detection of postpartum depression (PPD) is essential, as a significant proportion of cases — potentially up to half—may go unnoticed and untreated. This underdiagnosis is often due to the overlap between normal postpartum emotional fluctuations and early signs of mood disorders, as well as the stigma or lack of awareness surrounding mental health in the perinatal period. To improve early recognition, healthcare organizations stress the need for routine mental health screening in postpartum women. Notably, the American Academy of Pediatrics (AAP) advises that pediatricians should screen mothers for signs of PPD during well-baby visits at 1, 2, and 4 months postpartum [13,14]. These routine check-ups provide a strategic opportunity for identifying at-risk mothers, as they are among the few consistent medical touchpoints during early motherhood.

One of the most widely used tools for screening is the Edinburgh Postnatal Depression Scale (EPDS) — a validated self-assessment questionnaire designed to capture emotional and psychological symptoms commonly associated with postpartum depression. The EPDS includes 10 items that evaluate the mother's recent emotional state, focusing on indicators such as persistent sadness, heightened anxiety, sleep disturbances, and feelings of guilt or failure. Each response is scored on a scale, reflecting the severity of symptoms over the previous seven days. A total score of 13 or more typically signals the need for further clinical evaluation by a mental health professional, though even lower scores may warrant attention depending on individual risk factors and circumstances. The tool's simplicity and accessibility make it a valuable first step in identifying mothers who may benefit from further assessment or intervention [15,16].

By incorporating standardized screening measures like the EPDS into postpartum care, clinicians can better ensure timely intervention, thereby improving outcomes for both mothers and their infants.

Pharmacotherapy

Pharmacological treatment remains one of the key components in managing postpartum depression (PPD), particularly in moderate to severe cases where psychotherapy alone may not be sufficient. The therapeutic strategies used in treating PPD largely mirror those applied in the general population with major depressive disorder, though additional factors such as lactation, hormonal status, and recent physiological changes must be considered in the postpartum context.

Selective serotonin reuptake inhibitors (SSRIs) are the most frequently prescribed class of antidepressants for PPD. Medications such as sertraline, fluoxetine, bupropion, and amitriptyline have demonstrated efficacy in alleviating depressive symptoms and are generally well tolerated. SSRIs function by increasing the availability of serotonin in the brain, which can help stabilize mood and reduce feelings of sadness, anxiety, and fatigue. Among these, sertraline is often favored in postpartum care due to its relatively low levels of transfer into breast milk, making it a safer option for breastfeeding mothers [17,18].

Another area of growing interest is hormonal therapy, particularly estrogen-based treatments. This approach is grounded in the hypothesis that the sharp decline in estrogen and progesterone levels after childbirth may trigger depressive symptoms in susceptible individuals. Some clinical observations support the use of estradiol patches, which deliver a steady hormone dose transdermally, potentially stabilizing mood. However, this treatment is controversial and requires caution. Estrogen therapy is contraindicated in women at increased risk of thromboembolic events, a group that includes many postpartum patients—especially within the first 12 weeks after delivery. Additionally, most existing studies on hormone therapy have excluded breastfeeding participants, leaving an important gap in our understanding of safety and efficacy in this population [19,20].

Beyond traditional antidepressants and hormones, oxytocin—a neuropeptide involved in bonding, stress regulation, and maternal behavior—has emerged as a potential candidate for PPD treatment. While human research is still in its infancy, preclinical studies in rodent models have shown promising anxiolytic and antidepressant-like effects. This opens the door to future investigation of oxytocin's role in enhancing maternal emotional resilience and social connection in the postpartum period [21,22].

In severe, treatment-resistant cases of PPD, electroconvulsive therapy (ECT) remains a viable and effective option. Though often stigmatized, ECT can provide rapid and substantial relief from depressive symptoms, particularly in women who do not respond to medications or for whom pharmacotherapy poses significant risks. It is especially beneficial in situations where the patient's functioning is severely impaired or where suicidal ideation is present [23].

Overall, while pharmacotherapy plays a vital role in managing PPD, treatment plans should always be individualized. Consideration of the patient's psychiatric history, current medical status, breastfeeding preferences, and personal values is crucial in selecting the most appropriate and safe intervention.

Vitamin B6

Vitamin B6, also referred to as pyridoxine, is one of the B vitamins. Like other compounds belonging to it, vitamin B6 is soluble in water. This substance exists in six variants: as pyridoxine, pyridoxal, pyridoxamine or phosphate esters of the other three compounds. Vitamin B6 is absorbed into the bloodstream from the digestive tract, so it should be supplied to the body with food. It is then stored in the liver, kidneys, muscles and brain. Small amounts of vitamin B can also be synthesized in the intestines [24,25]. Dietary deficiency is rare. Classic clinical symptoms include rash and inflammation around the mouth and eyes, plus neurological effects that include drowsiness and peripheral neuropathy affecting sensory and motor nerves in the hands and feet. In addition to dietary shortfall, deficiency can be the result of anti-vitamin drugs. There are also rare genetic defects that can trigger vitamin B_6 deficiency-dependent epileptic seizures in infants. Vitamin B6 is involved in many aspects of macronutrient metabolism, neurotransmitter synthesis, histamine synthesis, hemoglobin synthesis and function, and gene expression. Pyridoxal phosphate (PLP) generally serves as a coenzyme (cofactor) for many reactions including decarboxylation, transamination, racemization, elimination, replacement, and beta-group interconversion [26].

The Role of Vitamin B6 in Neurotransmitter Synthesis

Vitamin B6 plays a crucial role in the synthesis of neurotransmitters, particularly serotonin and dopamine, which are essential for proper nervous system function and mental health. Serotonin, often referred to as the "happiness hormone," significantly impacts mood, emotions, and overall well-being. A deficiency in vitamin B6 may lead to decreased serotonin production, potentially contributing to the development of

depression, including postpartum depression. Similarly, dopamine, a neurotransmitter associated with the reward system and motivation, also requires vitamin B6 for its synthesis [27,28]. Maintaining adequate levels of these neurotransmitters is vital for mood regulation and behavior, and any imbalances can lead to depressive states. Therefore, it can be concluded that supplementing with vitamin B6 may have a positive effect on mood improvement and the prevention of postpartum depression by supporting the balance of these important neurotransmitters [29].

Clinical trial - conditions

This single-blind, placebo-controlled trial was conducted on 81 pregnant women who were at risk of PPD. The inclusion criterion was having at least one risk factor for PPD (history of psychiatric disorders, marital relationship, antenatal anxiety and depression, absence of depression and clinical anxiety in present pregnancy, lack of social support, recent stressful life events, as well as an unplanned pregnancy). The risk of PPD was assessed using a structured clinical interview using hospital anxiety-depressive scale (HADS), social support appraisals scale (SS-A), and Holmes and Rahe life change and stress evaluation questionnaire (HRLCSEQ). The Edinburgh postpartum depression scale (EPDS) was used to assess the rate of depression prior to and 1.5 months after the intervention. Independent t-test results showed that there was no significant difference between the two groups.

The case group received two 40 mg pills of vitamin B6 daily from the 28th week to the end of pregnancy and then one 40 mg pill of vitamin B6 for 1 month after delivery. The control group received two placebo pills daily from the 28th week to the end of pregnancy and then one placebo pill for 1 month after delivery.

According to paired t-test results, it was found that the mean score of depression in the post-intervention group was significantly lower than that of the pre-intervention group. In the control group, the mean score of depression was not significantly different pre- and post-intervention. No reportable complications were observed in both groups [30].

Conclusions

Postpartum depression is a major international public health problem that affects at least 1 in 8 mothers and their children in the year after childbirth worldwide. PPD may be more common and may be associated with more morbidity for both mothers and children in resource-poor countries. PPD has been associated with significant negative effects not only on depressed women themselves, but on the physical, cognitive and emotional development of their children. Early detection and intervention are important in mitigating these risks. According to the obtained results, vitamin B6 has a positive effect on reducing postpartum depression scores among mothers at risk for PPD. However, these arrangements should be seen as preliminary, until treatment is assessed in larger, multicentre studies of longer duration.

Disclosures

Author's contribution:

Conceptualization: Magdalena Próchnicka, Dominika Nowak, Adam Zarzycki, Michał Siwek, Jan Noskowicz, Jan Urban, Jakub Hamouta, Julia Konat, Wiktor Doroszuk, Patrycja Długosz.

Formal analysis: Magdalena Próchnicka, Dominika Nowak, Adam Zarzycki, Michał Siwek, Jan Noskowicz, Jan Urban, Jakub Hamouta, Julia Konat, Wiktor Doroszuk, Patrycja Długosz.

Methodology: Magdalena Próchnicka, Dominika Nowak, Adam Zarzycki, Jan Noskowicz, Jan Urban, Wiktor Doroszuk, Michał Siwek, Jakub Hamouta, Patrycja Długosz, Julia Konat.

Investigation: Magdalena Próchnicka, Dominika Nowak, Adam Zarzycki, Michał Siwek, Jan Noskowicz, Julia Konat.

Resources: Magdalena Próchnicka, Michał Siwek, Wiktor Doroszuk, Patrycja Długosz, Julia Konat. Writing- rough preparation: Magdalena Próchnicka, Dominika Nowak, Adam Zarzycki, Jakub Hamouta, Patrycja Długosz, Julia Konat, Wiktor Doroszuk, Jan Urban, Jan Noskowicz, Michał Siwek.

Writing- review and editing: Magdalena Próchnicka, Dominika Nowak, Adam Zarzycki, Michał Siwek, Jan Noskowicz, Jakub Hamouta, Julia Konat, Patrycja Długosz, Wiktor Doroszuk, Jan Urban.

Supervision: Magdalena Próchnicka.

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