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Risk factors for postpartum depression

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ABSTRACT

Postpartum depression has become an increasingly urgent problem of modern medicine and psychology. This condition is a mental disorder that causes emotional, behavioral, and physical changes associated with the postpartum period. Despite the presence of a wide range of signs, the diagnosis of postpartum depression remains challenging for specialists. A woman experiencing this type of depression may find it difficult to realize her condition on her own and seek help. However, even if properly diagnosed, the fact of having postpartum depression can be a negative experience for a woman. Young mothers often feel fear or shame in front of family members and the society and hide their diagnosis. This creates additional barriers to getting the necessary help and support.

This review aimed to identify and analyze risk factors of depressive disorders in women in the postpartum period and investigate some manifestations of postpartum depression.

The scientific databases CyberLeninka, eLibrary, and PubMed were used. The articles were searched for the following keywords: "postpartum period," "depressive disorder," "postpartum depression," "postpartum depression and risk factors," and "development of depressive disorders in the postpartum period." The study included articles published over the past 5 years. After sampling by annotations and keywords, 53 articles were analyzed: 6 Russian and 47 English speakers. The risk factors described in modern domestic and foreign literature were analyzed and were classified as unmodified and modifiable, which was further characterized as modifiable by the mother and/or her family and modifiable only by healthcare.

Keywords: postpartum depression; postpartum depression; review.

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Факторы риска послеродовой депрессии

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АННОТАЦИЯ

Послеродовая депрессия в последнее время становится всё более актуальной проблемой современной медицины и психологии. Традиционно это состояние рассматривается как психическое расстройство, вызывающее эмоциональные, поведенческие и физические изменения, связанные с послеродовым периодом. Несмотря на наличие достаточно широкого спектра признаков, диагностика послеродовой депрессии всё ещё представляет сложность для специалистов. Женщине, испытывающей данный вид депрессии, может быть трудно самостоятельно осознать своё состояние и обратиться за помощью. Однако даже в случае правильной диагностики сам факт наличия послеродовой депрессии может стать для женщины отрицательным опытом. Нередко молодые мамы ощущают страх или стыд перед членами семьи и обществом, скрывают свой диагноз. Это создаёт дополнительные преграды в получении необходимой помощи и поддержки.

Цель обзора — выявление и анализ факторов риска развития депрессивных расстройств у женщин в послеродовом периоде, изучение некоторых проявлений послеродовой депрессии.

Использовали научные базы «КиберЛенинка», eLibrary и PubMed, в которых искали статьи по следующим ключевым словам: «послеродовой период», «депрессивное расстройство», «послеродовая депрессия», «послеродовая депрессия и факторы риска», «развитие депрессивных расстройств в послеродовом периоде». В исследование включали статьи, опубликованные в последние 5 лет. После выборки по аннотациям и ключевым словам в обзор вошли 53 статьи (6 русскоязычных и 47 англоязычных). Проанализировали все описанные в современной отечественной и зарубежной литературе факторы риска, которые классифицировали как немодифицируемые и модифицируемые. Последнее, в свою очередь, разделили на модифицируемые со стороны матери и/или её семьи и модифицируемые только со стороны здравоохранения.

Ключевые слова: послеродовая депрессия; депрессивное расстройство в послеродовом периоде; научный обзор.

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产后抑郁症的风险因素

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摘要

产后抑郁症近年来已成为现代医学和心理学中一个越来越紧迫的问题。传统上，这种病症被认为是一种精神障碍，会导致与产后有关的情绪、行为和身体变化。尽管产后抑郁症有相当广泛的征兆，但对于专家来说，诊断产后抑郁症仍然很困难。患有这种抑郁症的女性可能很难独立意识到自己的病情并寻求帮助。然而，即使诊断正确，患有产后抑郁症这一事实本身也会给妇女带来负面的经历。年轻母亲在家庭成员和社会面前感到恐惧或羞耻，并隐瞒自己的诊断结果，这种情况并不少见。这为她们获得所需的帮助和支持造成了更多障碍。

本综述旨在确定和分析产后妇女患抑郁症的风险因素，并研究产后抑郁症的一些表现。

我们使用科学数据库CyberLeninka、eLibrary和PubMed，使用以下关键词搜索文章：“产后”、“抑郁症”、“产后抑郁”、“产后抑郁和风险因素”、“产后抑郁障碍的发展”。

最近 5 年内发表的文章被纳入研究范围。经过摘要和关键词筛选后，53 篇文章（6 篇俄文和 47 篇英文）被纳入研究范围。我们分析了国内外现代文献中描述的所有风险因素，将其分为不可改变和可改变。而后者又分为母亲和/或其家人可改变的风险因素和仅由医疗机构可改变的风险因素。

关键词：产后抑郁症；产后抑郁障碍；文献综述。

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INTRODUCTION

Postpartum depression (PPD) is a mental health condition that causes emotional, behavioral, and physical changes in women during the postpartum period [1]. The Russian authors have proposed their definition of PPD, describing it as a condition with serious consequences not only for a mother and a child, but for the whole family [2]. PPD symptoms include sleep disturbances, anxiety, hypothyria (a persistent low mood), fatigue, and obsessive worries and fears about the child's health [3].

The global prevalence of PPD is approximately 20% and varies widely between geographic regions, with the highest prevalence rates (39.96%) found in Southern Africa [4]. In Russia, the prevalence of PPD reaches 30% [5]. These data suggest that pregnancy, childbirth, and the postpartum period significantly affect women's physical and mental health, which is a pressing issue in obstetrics, gynecology, and psychiatry.

Given the paucity of information regarding PPD in Russian sources, we have endeavored to synthesize the risk factors for PPD that have been identified in the foreign literature in recent years. It is our contention that this will facilitate more accurate diagnosis of PPD in Russia. Risk factors were classified as non-modifiable and modifiable (Table 1). Modifiable risk factors can be divided into those that can be changed by the mother and/or her family and those that can only be changed by the healthcare system.

MATERNAL AND/OR FAMILIAL MODIFIABLE RISK FACTORS

Anemia during and after pregnancy

Azami et al. analyzed 10 studies and found an association between anemia during and after pregnancy and increased risk of PPD; other authors reached similar conclusions [6, 7].

Pain during and after labor

Mo et al. proposed postpartum pain as a risk factor for PPD and, based on the studies reviewed, suggested epidural anesthesia as PPD prevention [8]. However, other authors found no decrease in the risk of PPD with the use of epidural anesthesia during labor [9]. Some authors found an association of any spinal labor analgesia, not just epidural analgesia, with a lower risk of PPD. Others reported that spinal labor analgesia decreased the risk of PPD in a region with high rates of PPD but increased it in a region with low rates of PPD [10, 11].

Vitamin D deficiency

Wang et al. concluded that low vitamin D levels may affect the development of PPD, but they believe that this issue needs further research due to the limited number of studies. They also recommended prescribing prophylactic doses of vitamin D for pregnant women and mothers living in deficient regions [12]. Tan et al. found an association between low vitamin D levels and maternal depression, but did not establish a causal relationship and reported that more research was needed [13]. Guzek et al. reviewed 8 trials and found no evidence for the efficacy of vitamin D supplements in the treatment of depression [14].

Selenium deficiency

Fetal selenium consumption and excretion in breast milk, if not adequately replenished, may result in maternal selenium deficiency and increase the risk of PPD [15].

Family conflicts

Many studies show that mothers who have a good relationship with their partner experience less anxiety because they can count on their support, suggesting that family problems may be a risk factor for PPD [16]. Other authors

Table 1. Risk factors for postpartum depression

Maternal/family modifiable	Healthcare modifiable	Non-modifiable
Pain during and after labor	Aggressive, rough labor management	Season
Anemia during and after pregnancy	Socioeconomic ill-being	Genetic predisposition
Selenium deficiency	—	History of depression
Vitamin D deficiency	—	Refusal to breastfeed
Alcohol consumption during pregnancy	—	Premenstrual syndrome
Family conflicts	—	Sex of the child
Sleep disturbances	—	Preeclampsia
Unplanned pregnancy	—	Gestational diabetes
Low physical activity	—	Mode of delivery
Refusal to breastfeed	—	—

Note. Because autoimmune thyroiditis has not been confirmed as a risk factor for postpartum depression in more recent studies. New studies would possibly establish autoimmune thyroiditis as a risk factor.

believe it is necessary to promote partner involvement in the postpartum period in every way to improve the mother's condition and prevent PPD [17]. This study suggests the benefits of encouraging partners to contribute to maintaining the mother's health.

Russian papers describe effects of the marital status on PPD. Based on a study of 2,579 women, Yakubova et al. reported that the risk of PPD is higher in women who are in an unregistered marriage, divorced, or have no partner compared with married women [18]. Other Russian authors also reported the negative effects of family conflicts on the emotional state of women in the postpartum period [19]. Nael-Prupes et al. described case studies suggesting that lack of expected partner support during and after pregnancy is a potential risk factor for PPD [20].

Sleep disorders

Some meta-analyses show that various sleep disorders significantly increase the risk of PPD. However, this only applies to III trimester, and not to I trimester and/or II trimester. It should be noted that only poor sleep quality, but not insomnia, was found to significantly increase the risk of depression [21]. However, women diagnosed with PPD reported insomnia, so insomnia may be considered a symptom of PPD and a risk factor for PPD. Another study found that one-third of mothers with sleep problems had comorbid depression [22].

Unintended pregnancy

Qiu et al. reviewed 30 trials and found that unintended pregnancies had an increased risk of PPD compared with intended pregnancies. The authors associate unintended pregnancy with thoughts of abortion, cigarette and/or alcohol use, and mental disorders, including depression during pregnancy, which can lead to PPD [23]. Russian authors also mention unintended pregnancy as a risk factor for PPD [3].

Low physical activity

Vargas-Terrones et al. conducted a randomized controlled trial in which women performed an exercise program three times a week throughout pregnancy. A lower percentage of patients with PPD was reported compared to the control group (14.5% vs. 29.8%) [24]. Aguilar-Cordero et al. also conducted a randomized controlled trial in which participants practiced moderate physical exercise in an aquatic environment for 1 hour three times per week during pregnancy. The risk of depression was significantly different between the experimental and control groups ($p < 0.001$) [25]. Other authors report physical activity during and after pregnancy as a way to reduce the incidence of PPD [26, 27], suggesting that low physical activity is a risk factor for PPD.

Refusal to breastfeed

Alimi et al. found that refusal to breastfeed increased the risk of PPD [28]. Other authors also show that breastfeeding

women have a statistically significant lower risk of PPD compared to non-breastfeeding mothers [29]. We believe that counseling and educating mothers about the benefits of breastfeeding, including mental health benefits, is crucial. Already in the maternal and child health department, mothers should be provided with comfortable conditions for initiating breastfeeding, such as early attachment of the baby to the breast, good latching, thorough care to avoid cracked nipples, and timely feeding to avoid milk stagnation [28]. Russian authors also mention refusal to breastfeed as a risk factor for PPD [3]. Gorkova et al. anonymously surveyed 20 female respondents aged 25–35 years to assess effects of breastfeeding on their emotional state; 10 respondents breastfed and 10 preferred formula feeding. The study found that breastfeeding women's anxiety scores using the HADS (Hospital Anxiety and Depression Scale) ranged from 2 to 6, while anxiety scores in formula feeding women were significantly higher, ranging from 8 to 10 out of a maximum of 10 [29]. It should be noted that refusal to breastfeed may also be considered a non-modifiable risk factor for PPD when medically indicated.

Alcohol use

Qiu et al. reviewed 12 cohort studies and found an association between alcohol use during pregnancy and an increased risk of PPD compared with women who did not consume alcohol during pregnancy [31].

MODIFIABLE RISK FACTORS IN THE HEALTHCARE SYSTEM

Aggressive or harsh labor management

A study in Turkey showed that women who were exposed to obstetric violence (inappropriate and rude comments by healthcare workers, ignoring of patient complaints) were more likely to develop PPD [32]. Both verbal and psycho-affective violence increase the risk. Another study conducted in Spain also found an association between PPD and aggressive management of labor such as induction of labor, rupture of membranes, and unindicated episiotomy [33]. It is important to discuss these issues because women are very vulnerable during labor and a respectful and supportive attitude from doctors and nurses can keep them positive.

Socio-economic disadvantage

In a review of 4 studies, Chen et al. found an increased risk of PPD in Chinese immigrant women due to lack of social support and unstable economic status. Russia also has many immigrant women who give birth in socially and economically disadvantaged conditions, i.e. they have the same risk factors for PPD. Therefore, this issue requires the attention of the Russian obstetrics/gynecology and psychiatry communities [34]. Rajendran et al. conducted a randomized controlled trial and concluded that access to healthcare

would reduce the risk of PPD in Hispanic women giving birth in the United States [32]. Hidalgo-Padilla et al. reviewed 23 papers and concluded that women who do not have paid and extended maternity leave are at risk for PPD [35]. This is a time of adjustment to the role of mother, which helps avoid or reduce the stress of new responsibilities. Leave duration, pay (partial, full or no pay) and job protection (right to return to previous job or equal pay) directly affect women's mental health, especially at such a vulnerable time. The authors of another study came to an interesting conclusion that women in medical residency have a higher risk of PPD, which may be explained by the lack of long-term leave, pay, and job protection [37]. Although this paper suggests that postpartum university attendance is a risk factor for PPD, some national studies suggest that prepartum university attendance reduces this risk. For example, the risk of PPD is the highest in women with primary education, slightly lower in women with secondary education, and the lowest in women with higher education. Russian authors also report an association between the PPD and financial disadvantage; the risk of PPD is higher in women with low economic status [18, 19].

NON-MODIFIABLE FACTORS

Autoimmune thyroiditis

Minaldi et al. suggested that autoimmune thyroiditis during pregnancy is associated with an increased risk of PPD; however, the authors reported that further research is needed to confirm this association and to evaluate the pathogenesis [38]. However, three years later, a meta-analysis by Sileo et al. did not confirm the association between thyroid peroxidase antibodies during pregnancy and an increased risk of PPD [39].

Season of the year

A review of 5 studies by Tung et al. found that the risk of PPD was higher in women who gave birth in winter than in those who gave birth in spring, summer, or fall. The mechanism of seasonal effects on PPD is not well understood, but it is thought to be related to seasonal and light-induced changes in hormonal levels, reduced outdoor activity and light exposure due to reduced daylight, and increased time spent indoors, which deprives women of needed support in the postpartum period and is likely to lead to the low physical activity discussed as one of modifiable risk factors [40].

Genetic predisposition

The relationship between genetic and environmental factors that may influence the development of PDD is currently under active investigation. Recent molecular genetic studies show that differences in postpartum mental disorders in women can be explained by polymorphism of the oxytocin receptor gene. The presence of the A allele of OXTR rs53576 indicates a higher predisposition to PPD, increasing the overall risk for social and regulatory difficulties, greater

stress reactivity, and lower empathy [41]. In contrast, G allele homozygosity is associated with greater sociability and higher stress resistance, which reduces the risk of PDD [42].

History of depression

In some studies, women with a history of depression and other mental disorders were found to be more likely to develop PPD (risk ratio 1.79%) than mothers without such disorders, and the risk was also higher with a family history of such disorders [43].

Premenstrual syndrome

Pereira et al. reviewed 7 studies and concluded that women with premenstrual syndrome are at risk for perinatal depression, especially postpartum depression [44]. Other authors obtained similar findings [45, 46].

Sex of a child

The relationship between the sex of the infant and the risk of PPD is not fully understood. However, a review of 23 articles by Liu et al. showed a significantly greater risk of PPD in women who gave birth to girls. Other risk factors are not associated with cultural characteristics of different countries, but the sex of the child may influence the development of PPD depending on the traditions and values of a particular country [47]. However, other authors suggest that giving birth to boys increases the risk [48]. These studies should be confirmed or refuted by other studies to determine whether or not a causal relationship does exist.

Pre-eclampsia

Caropreso et al. considered pre-eclampsia as a condition that increases the risk of PPD. The authors also report that women with pre-eclampsia have more pronounced depressive symptoms than women with PPD who did not have pre-eclampsia during pregnancy. In addition, pre-eclampsia is associated with placental abruption, preterm delivery, stillbirth, and fetal growth retardation, which may be an additional risk factor for PPD [49].

Gestational diabetes

A Ugandan study showed a statistically significant association between maternal diabetes mellitus at 6 weeks to 6 months postpartum and PPD. Diabetes mellitus was found in 28.0% of mothers with PPD and in only 13.6% of mothers without PPD [50]. However, diabetes mellitus and PPD have a bidirectional relationship that worsens the course and prognosis of both diseases [51].

Polycystic ovary syndrome

Schoretsanitis et al. concluded that women with polycystic ovary syndrome may be more susceptible to PPD because they have a higher overall risk of mental health disorders. In addition, polycystic ovary syndrome and PPD share common risk factors, such as metabolic disorders [52]. Other authors

also reported a higher risk of PPD in patients with polycystic ovary syndrome [53].

Mode of delivery

Russian authors report the mode of delivery as a risk factor. For example, women who have had a vaginal birth have the lowest risk of PPD, while those who have had an artificial, emergency, or planned cesarean delivery have the highest risk [18]. Other Russian studies also found a higher risk of PPD after cesarean delivery than after vaginal delivery [2, 3].

Discussion

Our paper does not describe all the risk factors for PPD. In fact, there are many more risk factors, which makes this a pressing scientific issue, especially in our own country, where information about this condition is limited. Although PPD is addressed by both obstetrics/gynecology and psychiatry, it is not included in clinical guidelines. Moreover, original Russian studies are limited, and the conclusions of foreign studies are only partially applicable to our patients due to ethnic, economic, cultural, and other differences, as well as differences in healthcare systems.

This is because epidemiological data on the prevalence of PPD in Russia are limited and unclear, and there are no standardized clinical guidelines for the diagnosis and treatment of PPD. In addition, the International Classification of Diseases, Tenth Revision, diagnoses PPD in a woman only if her symptoms appear within 6 weeks of childbirth, which poses some difficulties because a significant number of women who gave birth simply do not have the opportunity to see a doctor or seek medical care at that time due to physical conditions and complications during pregnancy and/or childbirth, which are initially more significant than psychological problems. In our opinion, Russian clinical guidelines are highly needed to standardize the diagnosis and treatment of PPD. However, new studies will provide an opportunity for a realistic assessment of the PPD prevalence in Russian women.

As for risk factors, non-modifiable risk factors are useful only in diagnosis, while modifiable risk factors can be mitigated to reduce the prevalence of PPD in Russian women. These factors include promotion of breastfeeding and healthy lifestyle, especially moderate physical activity and abstinence from alcohol (at least during pregnancy). Accessible and understandable information on available birth control methods, as well as support for girls and women who are victims of sexual violence within families, will reduce the number of unintended pregnancies and abortions, thus preserving the reproductive potential of the population. Monitoring serum iron, vitamin D, and selenium levels during pregnancy and postpartum and replenishing deficiencies in a timely manner may prevent PPD.

CONCLUSION

The risk factors for PPD have been reviewed, collected, and classified from the literature over the past 5 years (see Table 1) to contribute to the timely diagnosis and treatment of PPD and to understand the reasons for its high prevalence. On the one hand, factors such as genetic predisposition, history of depression, type 1 diabetes, premenstrual syndrome, pre-eclampsia do not depend on a woman's lifestyle. These also include aggressive management of labor, socioeconomic status, and mode of delivery.

On the other hand, factors such as alcohol consumption during pregnancy, low physical activity, type II diabetes, polycystic ovary syndrome, anemia during and after pregnancy, vitamin D and selenium deficiency, unintended pregnancy are caused by unhealthy lifestyle, physical inactivity, poor diet, neglecting contraception, or using unreliable birth control methods. Management of these risk factors is likely to reduce the prevalence of PPD.

Finally, there are factors that do not always depend on a woman but that she can influence, such as refusal to breastfeed (return to breastfeeding if there are no medical contraindications), pain during and after childbirth (use of epidural anesthesia), sleep disturbances (consult a neurologist and take prescribed medication), family conflicts (psychotherapy).

Factors such as the sex of a child and the time of year of childbirth and the postpartum period warrant special attention: they are not dependent on women, doctors, or healthcare. More research is needed to confirm or refute the association between these factors and the risk of PPD.

ADDITIONAL INFO

Authors' contribution. D.V. Korolyova — collection and analysis of literary sources, translation of English sources, writing the text; S.A. Yakunina — collection and analysis of literary sources, translation of English-language sources; V.V. Shemyakin — collection and analysis of literary sources, translation of English-language sources, writing the text; E.A. Svidinskaya — writing the text, preparation and editing of the article; E.A. Sosnova — preparation and editing of the article, making critical comments and corrections. All authors confirm the compliance of their authorship with the international criteria of the ICMJE (all authors have made a significant contribution to the development of the concept, research and preparation of the article, have read and approved the final version before publication).

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