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POST-TRAUMATIC STRESS DISORDER ASSOCIATED WITH PREGNANCY AND CHILDBIRTH: DEFINITIONS, MODERN CONCEPTS, PATHOPHYSIOLOGICAL MECHANISMS, RISK FACTORS, DIAGNOSIS

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Abstract. The review focuses on post-traumatic stress disorder associated with pregnancy and childbirth. In the literature, there is the concept of post-traumatic stress disorder associated with pregnancy and childbirth, which describes mental disorders in parents during the period from the beginning of pregnancy to 12 months after childbirth. In contrast to the classical concept of post-traumatic stress disorder, this term is used in most cases in relation to the mother, less often in relation to the father of the child, in the presence of traumatic events associated with pregnancy and childbirth, starting from the beginning of pregnancy and up to 1 year after childbirth. The uniqueness of this term is emphasized from the perspective of mental disorders in parents associated with traumatic events during pregnancy, childbirth and the subsequent fate and prognosis for a premature child and/or a child with pathology. Data is provided on the complexities of terminology used to describe traumatic events from the beginning of pregnancy to 12 months after childbirth. Information is presented on the prevalence of stressful conditions during the period associated with pregnancy and childbirth in parents, risk factors are described in detail, including obstetric, socio-economic, pathophysiological, and psychiatric. The stressful conditions of parents whose children are in the intensive care unit are described separately, with a description of the parents' reactions to different outcomes of the child's hospitalization. Options for the prevention of stressful conditions in parents are highlighted, and recommendations are provided for identifying patients suffering from post-traumatic stress disorder associated with pregnancy and childbirth, and for the interaction of maternity workers with this group of patients.

Key words: post-traumatic stress disorder; postpartum post-traumatic stress disorder; perinatal loss; postpartum period; traumatic birth.

ПОСТТРАВМАТИЧЕСКОЕ СТРЕССОВОЕ РАССТРОЙСТВО, СВЯЗАННОЕ С БЕРЕМЕННОСТЬЮ И РОДАМИ: ДЕФИНИЦИИ, СОВРЕМЕННЫЕ ПРЕДСТАВЛЕНИЯ, ПАТОФИЗИОЛОГИЧЕСКИЕ МЕХАНИЗМЫ, ФАКТОРЫ РИСКА, ДИАГНОСТИКА

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Резюме. Обзор посвящен посттравматическому стрессовому расстройству, связанному с беременностью и родами. В литературе существует понятие посттравматического стрессового расстройства, связанного с беременностью и родами, которое описывает психические нарушения у родителей в период от начала беременности до 12 месяцев после родов. В отличие от классического понятия посттравматического стрессового расстройства данный термин употребляется в большинстве случаев по отношению к матери, реже по отношению к отцу ребенка, при наличии травмирующих событий, связанных с беременностью и родами, начиная от начала беременности и включительно до 1 года после родов. Подчеркивается уникальность данного термина с позиции психических нарушений у родителей, что связано с травмирующими событиями на протяжении беременности, родов и дальнейшей судьбой и прогнозом для недоношенного ребенка и/или ребенка с патологией. Приводятся данные о сложностях терминологии, используемой для описания травмирующих событий от начала беременности до 12 месяцев после родов. Изложена информация о распространенности стрессовых состояний в период, связанный с беременностью и родами, у родителей, подробно описываются факторы риска, в том числе акушерские, социально-экономические, патофизиологические, психиатрические. Отдельно описываются стрессовые состояния родителей, чьи дети находятся в отделении реанимации и интенсивной терапии, с описанием реакции родителей при различном исходе госпитализации ребенка. Освещаются варианты профилактики стрессовых состояний у родителей, а также приводятся рекомендации по выявлению пациентов, страдающих посттравматическим стрессовым расстройством, связанным с беременностью и родами, взаимодействию с данной группой пациентов работников родовспомогательных учреждений.

Ключевые слова: посттравматическое стрессовое расстройство; послеродовое посттравматическое стрессовое расстройство; перинатальная утрата; послеродовой период; травматичные роды.

Posttraumatic stress disorder (PTSD) is defined as “a complex of somatic, cognitive, affective and behavioral consequences of a psychological trauma” [19, 20]. PTSD associated with pregnancy and childbirth (P-PTSD) is a type of PTSD, but it is a unique variety of the latter and it has common features with the classical PTSD, with which an average of 4 to 8% of the general population are affected at any given time. Classical PTSD is more common in women [6, 13, 17, 38].

PTSD associated with pregnancy and childbirth occurs after experiencing a traumatic event in women at any time after conception and up to 6–12 months after childbirth, it lasts longer than 1 month and has an extremely negative impact on the health of the mother and child [8]. From 3 to 15% of women experience PTSD during pregnancy and childbirth [8]. Approximately 3.3% of pregnant women suffer from PTSD and 4% of women suffer from postpartum PTSD [3]. According to a number of data, the incidence of pregnancy-related PTSD in women ranges from 2.3 to 24% [13]. Thus, the data on the prevalence of PTSD during pregnancy and childbirth vary.

Currently, the number of studies on PTSD during pregnancy and childbirth is limited. In the 1990s, the first studies aimed at postpartum PTSD began to appear, but none of the mothers met the criteria of classical PTSD [3, 6].

PTSD during pregnancy and after childbirth can be a continuation of pre-existing post-traumatic stress or reactivation of post-traumatic stress in remission [17].

Post-traumatic stress disorder associated with pregnancy and childbirth, at times with pronounced clinical manifesta-

tions, can also be observed in health professionals of obstetric institutions when they provide medical care in difficult situations involving a risk for a woman and her child, as well as if these factors are combined with personal psychological trauma [32].

PATHOPHYSIOLOGY OF POST-TRAUMATIC STRESS DISORDER ASSOCIATED WITH PREGNANCY AND CHILDBIRTH AND STRESS RESPONSE

In a perinatal loss, one of the factors in the development of post-traumatic stress disorder is the interruption of the chemically mediated connection between mother and child by reproductive hormones [8].

Post-traumatic stress disorder during pregnancy is associated with impaired regulation of cortisol, vasopressin and oxytocin. Disruption of the regulation of the latter can cause complications in childbirth [9, 16, 26].

Studies of post-traumatic stress have shown that memories of a traumatic event activate the amygdala and stimulate the emergence of a fear reaction in a person as the „fight-or-flight“ response, increasing the breathing and heart rates, increasing blood pressure and contributing to the shift of blood flow from visceral muscles to skeletal ones [14]. When adapting to dangerous situations, the „fight-or-flight“ response may become predominant by default with the activation of the hypothalamic-pituitary-adrenal axis, remaining in non-dangerous situations when exposed to the trigger [14].

There is a polyvagal theory of stress, also known as Stephen Porges' vagus nerve theory, according to which, in the case of stressful events, the sympathetic nervous system is involved through the hypothalamic-pituitary-adrenal axis by releasing catecholamines and the parasympathetic system — by releasing oxytocin, as a result of which a person tries to reduce the level of stress looking for a partnership with another person who does not experience a „fight-or-flight“ response [14].

Upcoming childbirth can contribute to the activation of the „fight-or-flight“ response, alter the functioning of the hypothalamic-hypophyseal-adrenal axis and the level of catecholamines [14]. The search for support among the environment and staff, mutual regulation of the sympathetic and parasympathetic systems can be a therapeutic response to stressful events through the anti-stress properties of oxytocin [14].

One of the theories of post-traumatic stress disorder is the failure of the fear reaction to subside [14]. Under the action of the trigger that causes the fear reaction, the activation of the hypothalamic-pituitary-adrenal axis continues, since the hippocampus and prefrontal cortex (which usually reduce the fear reaction in the absence of real danger) do not react in the usual way. The trigger-specific reaction in post-traumatic stress disorder is not sufficiently modulated [14]. A hypermodulated reaction similar to freezing or fainting is possible. To interrupt the fear reaction, it is necessary to use the cognitive processes that control the trigger and transform the provoking automatic repeated experiences and hypo- and hyperexcitation reactions [14, 17, 25, 36]. Current research shows that the use of cognitive behavioral therapy works by inhibitory learning when a person realizes that s/he can tolerate triggers, thereby weakening the habitual fear and avoidance reactions to reminders of the traumatic event [14, 25, 27, 36].

In addition, stress during pregnancy leads to the suppression of the placental enzyme 11- β -hydroxysteroid dehydrogenase type 2, which performs a protective function by blocking excess cortisol, which contributes to survival in difficult conditions, but has a negative impact on the further development of the child [14].

Post-traumatic dysregulation of oxytocin may result in pain syndrome, which is secondary to the dysregulation of smooth muscle peristalsis in patients with pelvic pain, irritable bowel syndrome, bladder pain. There is a cascade theory, according to which traumatic experiences in childhood, such as abuse, lead to a cascade of adaptive functions of oxytocin, catecholamines and to emergence of the hypothalamo-pituitary-adrenal axis, that may persist into adulthood [14].

Thus, there are a few distinct theories of postpartum affective disorders, such as postpartum depression and postpartum psychosis. However, as to post-traumatic stress dis-

order and stress reactions associated with pregnancy and childbirth, then changes in the level of hormones, genetic mechanisms, changes in the neuroimmune system cannot fully explain the stress reactions during pregnancy and after childbirth. This undoubtedly requires additional study of the pathophysiological mechanisms of stress during these periods. So the possible difficulties with working out clinical criteria and treatment of post-traumatic stress disorder associated with pregnancy and childbirth may result [26, 27].

CLINICAL PRESENTATION OF POST-TRAUMATIC STRESS DISORDER ASSOCIATED WITH PREGNANCY AND CHILDBIRTH. DIAGNOSTIC CRITERIA

1–2 months after childbirth, 33% of women experienced the so-called intrusion symptoms (obsessive memories, nightmares, somatic manifestations) associated with the stress during pregnancy and childbirth, 33% of women reported constant nervous tension, agitation [6]. Post-traumatic stress disorder associated with pregnancy and childbirth is characterized by depressive symptoms, suicidal thoughts, feelings of guilt, anger, immediate stress reactions, feeling of grief, obsessive thoughts and memories (often memories are vivid), a feeling of being retarded, a feeling of emotional numbness, avoidance of the child delivery reminders or other events related to the child, increased irritability, a feeling of losing control over one's life, a feeling of being trapped [4, 17, 36]. Concentration of attention is significantly reduced, the normal daily functioning of patients is disturbed, intra-family relationships and relationships with others can noticeably deteriorate [4, 12].

At present various researchers are trying to identify and summarize the criteria for postpartum post-traumatic stress disorder associated with pregnancy and childbirth, but doctors continue to be guided by the main criteria for post-traumatic stress disorder.

In the current international classification of diseases, post-traumatic stress disorder is classified under the heading F43 „Reaction to severe stress and adaptation disorders“. Directly post-traumatic stress disorder is encoded with the code F43.1. Diagnostic criteria, according to ICD-10, are: an exceptionally strong, but short-lived (within hours, days) traumatic event that threatens the mental or physical integrity of the individual, an abrupt change in social status or environment [1].

DSM 5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) also describes the main symptoms of post-traumatic stress disorder: repetition of obsessive thoughts and dreams associated with a traumatic event, constant avoidance of any reminders of trauma, sleep disorders, irritability, outbursts of anger and aggression, negative changes in mood and thoughts [2, 5, 18].

It is worth noting that criteria for post-traumatic stress disorder such as a real threat to life, trauma, violence cannot be applied to post-traumatic stress disorder associated with pregnancy and childbirth, since most women have had no real threat to their, neither to the life or their newborn [5].

Thus, the main distinctive features of pregnancy and childbirth related PTSD are associated with such events as traumatic child delivery, death of the child or his or her stay in the resuscitation or intensive care unit.

In the clinical presentation of post-traumatic stress disorder associated with pregnancy and childbirth, typical manifestations are: repeated experiences of psychotrauma in the form of obsessive memories (reminiscences), such as intrusive memories of emergency caesarean section or hemorrhage, nightmare dreams, fantasies and visions; making up a background to repeated experiences of psychotrauma, there is a feeling of „numbness“ and flattening of affect, social alienation, reduced reaction to surrounding people and events, anhedonia, avoidance of situations reminiscent of psychotrauma, avoiding the place where psychotraumatic events occurred; in rare cases, a woman can avoid her child, trying to spend less time with him/her, at times there may be acute episodes of fear, panic, aggression caused by unexpected memories of psychotrauma or reaction to it, a state of increased nervous tension, which, for example, is manifested by flinching at the crying of the child, insomnia. There is also increased autonomic excitability, increased wakefulness with insomnia, pronounced fright reactions. The onset of the disorder after a latent period is from a few weeks to six months [1, 2, 6, 8, 36].

In the clinical presentation of post-traumatic stress disorder associated with pregnancy and childbirth, there is a concept of internal and external distress. Externalization of distress consists in negative reactions aimed at other people. Such reactions seem to be caused by a feeling of despair or revenge. Internal distress reactions seem to occur in a person previously traumatized in his childhood. However, these manifestations do not occur in all people experiencing stress during pregnancy and after childbirth. Patients with behavioral disorders who exhibit aggression in obstetric institutions should be under constant supervision of medical staff [6].

In case of internalization of distress during pregnancy and after childbirth, patients tend to blame themselves for all events that have occurred, one can see psychosomatic manifestations, deterioration of general well-being, exacerbation of chronic diseases, possible short-term manifestation of these phenomena or long-term ones, up to several months or years. There are manifestations of anxiety and depression, the possible development of eating disorders such as anorexia nervosa, overeating, etc. [6, 22]. The prolonged course of maternal depression affects the mother-

child dyad, affection that gets disturbed (insecure attachment), which also affects subsequent generations [3].

Thus, post-traumatic stress disorder associated with pregnancy and childbirth, although it is similar to the classic post-traumatic stress disorder, it has its own unique criteria related to pregnancy and childbirth, which should be taken into account when diagnosing, treating and working with this group of patients.

RISK FACTORS

Identification of risk factors makes it possible to prevent or reduce clinical manifestations of post-traumatic stress disorder associated with pregnancy and childbirth [8, 17].

CHARACTERISTICS OF THE CHILDBIRTH PROCESS

Risk factors include traumatic child delivery. Women, referring to the process of traumatic childbirth, mean the loss of a child in the perinatal period, the use of forceps or vacuum extractor, emergency caesarean section, labor pain, fear of epidural anesthesia, fear of labor, insufficient anesthesia, postpartum bleeding, post-hemorrhagic anemia, preterm labor, multiple pregnancy, severe toxemia, a sense of loss of dignity or humiliating experiences for a woman during child delivery [5, 8, 17–19]. The risk group also includes patients who have experienced preterm labor, suffered from preeclampsia and hyperemesis of pregnant women [5, 8].

Six weeks after childbirth, the incidence of post-traumatic stress disorder ranges from 2.8 to 5.6%. After the process of traumatic childbirth, the prevalence of post-traumatic stress disorder associated with pregnancy and childbirth ranges from 3.1 to 15.9% in mothers from high-risk group. About 50% of women report having experienced a traumatic child delivery [8]. One of the first studies found that 75% of women within a few days after an emergency caesarean section considered it a traumatic event, 48% of women noted obsessive memories of child delivery, and 24% of women reported constant nervous tension [6]. Women who consider childbirth traumatic are more likely to meet the criteria for post-traumatic stress disorder [15]. This group of patients may not meet all the criteria for post-traumatic stress disorder, but it is possible to develop post-traumatic syndrome after childbirth, which significantly impairs their quality of life [15, 17].

Birth pain is one of the predisposing factors for the development of post-traumatic stress disorder, which emphasizes the importance of determining a woman's need for pain relief in time [19, 20]. Fear of labor pain and the process of childbirth can act as a factor causing the development of symptoms of PTSD associated with pregnancy and childbirth. Even with a successful completion of the labor, these

also contribute to a negative subjective assessment of the delivery, regardless of its objective characteristics [13, 15]. Fear of labor and labor pain increases women's requests for caesarean section and is an important and unique predictor for the development of post-traumatic stress disorder associated with pregnancy and childbirth [15, 17].

Thus, the fear of childbirth and a woman's experience of childbirth, both subjective and objective, can serve as a marker of the possible development of psychopathology in the postpartum period, which is important, in our opinion, to take into account in the clinical observation of such patients [15].

The risk factor is a subjective distress during child delivery, which includes the presence of negative emotions, loss of control over what is happening, the development of such a state as dissociation, characterized by a loss of expression of emotions, temporary loss of sense of reality [8, 17]. Lack of support during childbirth from medical staff or relatives reduces the woman's sense of control during childbirth, which increases the risk of postpartum mental disorders. Four weeks after childbirth, a woman's subjective perception of the delivery process is associated with post-traumatic syndrome, but eight weeks after childbirth this connection is less pronounced [15]. These indicators are associated with the fact that the subjective perception of childbirth by a woman is temporary, weakening over time from the moment of childbirth [15, 17]. Dissatisfaction with the delivery process also increases the risk of developing mental pathology in the postpartum period [17]. However, after childbirth, the importance of other factors that may affect the developing and continuing psychopathological symptoms increases. These may be difficulties with breastfeeding, difficulties in childcare, marriage problems, etc. [15, 17].

Prevention of post-traumatic stress disorder associated with pregnancy and childbirth is known to include a birth plan, when the woman is psychologically prepared for all stages of childbirth, the use of epidural anesthesia and skin-to-skin contact between the mother and the baby. The age of the mother of 35 years and older also contributes to this. The use of the Kristeller maneuver, instrumental delivery or delivery by caesarean section, ruptures of the perineum of degree III and IV, as well as the use of general anesthesia, manual separation of the placenta are risk factors for the development of post-traumatic stress disorder [19, 20].

Maternal assessment of the quality of communication with medical personnel of obstetric institutions is also a risk factor for the development of post-traumatic stress disorder associated with pregnancy and childbirth. These risk factors include lack of support from medical staff, lack of empathy, lack of information about their health and/or the child's health, negative communication between staff and patients [8, 19, 20]. For example, mothers whose children are in the intensive care unit often do not have a complete picture of the child's

actual health status and believe that the child is healthier than s/he actually is [24]. Thus, in parents whose children are in the intensive care unit, factors related to the severity of the child's condition and the parent's perception of this condition are added to the main risk factors for post-traumatic stress disorder [24, 28]. Such cognitive and behavioral factors as negative cognitive perception of the childbirth process, the nature of memories of the psychotraumatic factor, avoidance behavior that consolidates the psychotraumatic event, contribute to the development of post-traumatic stress disorder associated with pregnancy and childbirth [9, 21].

Thus, in the process of childbirth, there is a large number of factors that can affect the development of post-traumatic stress disorder associated with pregnancy and childbirth, these ranging from fear of child delivery, objective and subjective characteristics of the delivery process itself to the woman's communication with medical staff, which, in our opinion, is important to take into account when working in obstetric institutions.

PRESENCE OF A PSYCHIATRIC HISTORY IN THE MOTHER AND A TRAUMATIC EVENT IN THE HISTORY. PERINATAL LOSS

There is evidence that psychiatric morbidity may be the leading cause of maternal mortality in the postpartum period [3]. An 80-fold increase in suicides has been estimated in women suffering from severe mental illness within a year after childbirth [3].

The risk factors for developing post-traumatic stress disorder associated with pregnancy and childbirth include: psychiatric history in the mother, anxiety and depression during pregnancy and after childbirth, unfavorable obstetric history, a traumatic event or several traumatic events experienced, perinatal loss, sexual abuse and the mother's specific personality features [5, 6, 8, 10, 13, 19, 20, 23].

Women who do not have other children experience more pronounced symptoms of grief and stress after perinatal loss [21]. Women with post-traumatic stress disorder associated with pregnancy and childbirth are at a five-fold risk of having a major depressive disorder and at a three-fold risk of generalized anxiety disorder [11].

Previous traumatic experience has been found to moderately influence the likelihood of developing post-traumatic stress in case of a new traumatic experience. Most often, additional traumatic events make it possible to predict the development of stress in certain population groups. Such predictors include exposure to multiple traumatic events, interpersonal trauma. The clinical prognosis tends to get worse when the woman is exposed to several stressful events within a short period of time [6].

Patients with confirmed or suspected personality disorders, such as borderline personality disorder, narcissistic personality disorder and dissocial personality disorder are at increased risk of developing a post-traumatic stress disorder, including the one associated with pregnancy and childbirth [6]. The presence of a neurotic disorder increases the risk of post-traumatic stress disorder emergence, with those associated with pregnancy and childbirth belonging there. It is possible to fully assess the impact of neurotic conditions on the development of post-traumatic stress disorder in the postpartum period only if exposure to a traumatic event has been identified in the process of direct clinical examination in the postpartum period [6].

Women suffering from affective disorders are at risk of relapse during pregnancy and after childbirth, especially if they do not take any medication [3, 36]. Mental disorders such as major depressive disorder, obsessive-compulsive disorder and post-traumatic stress disorder associated with pregnancy and childbirth have common risk factors, they are often comorbid with each other, but each of these diseases represents a separate nosology [15, 33, 34]. The frequent combination of postnatal depression and post-traumatic stress disorder makes it difficult to distinguish the unique characteristics of post-traumatic stress disorder associated with pregnancy and childbirth, such as traumatic intrusions and avoidance [15, 17].

During pregnancy the risk of recurrence of bipolar disorder (at least of one) is estimated to be 71%. The risk is doubled in women who have stopped taking mood stabilizers [3]. In patients with a major depressive episode, during pregnancy the frequency of recurrence was assessed to be 68% in the women who had stopped taking supportive medication, compared to 26% of women continuing to take the therapy [3]. It is very important to take supportive therapy during pregnancy, because in women with a history of bipolar affective disorder the frequency of postpartum psychoses can increase by 300 times, in women with a previous episode of postpartum psychosis, the frequency of relapse is more than 50% [3, 26].

The prevalence of post-traumatic stress disorder in the postpartum period significantly increases with stillbirth, the infant admission to the resuscitation or intensive care unit, the infant death in the intensive care unit, it accounts for 25 to 35% [8, 28]. In couples experiencing perinatal loss, an increased level of intensive stress in the man was noted to contribute to an increased stress level in the woman, and vice versa [4]. Perinatal loss is a traumatic experience that negatively affects not only the physical condition of patients, but also their mental state and social life [12]. According to a number of authors, in case of a perinatal loss, especially of an early one, parents are not given due attention, although

the consequences of an early perinatal loss can become quite severe, as well as it happens in case of other severe traumatic events [12]. According to statistics, up to 25% of pregnancies result in perinatal loss, after which 50–80% of women repeat their pregnancy. However, such families do not receive sufficient specialist professional assistance. Up to 25% of women may have clinical manifestations of the post-traumatic stress disorder in the first month after their perinatal loss [12]. Symptoms of the post-traumatic stress disorder may occur in the subsequent pregnancy after a perinatal loss, and 4% of women develop a chronic post-traumatic stress disorder [12]. Women with symptoms of post-traumatic stress associated with pregnancy and childbirth are less likely to become pregnant again, they have a longer interval between pregnancies, their quality of life deteriorates in both the short and long term [7, 19, 20]. A year after the birth of a healthy child from a pregnancy after the perinatal loss, the prevalence of post-traumatic stress disorder associated with pregnancy and childbirth ranges between 4 to 6% [12]. Other factors aggravating a perinatal loss are: guilt and shame experienced, additional stress due to being in the intensive care unit, which is also supplemented by sleep disturbance and neuroendocrine changes, also by impaired relationship in the parental couple [8].

Often women who have suffered from a perinatal loss are not included into studies on post-traumatic stress disorder associated with pregnancy and childbirth, since the diagnosis of this condition can be confused with a pronounced component of loss [13].

Symptoms of post-traumatic stress disorder associated with pregnancy and childbirth are also observed in fathers actively involved into the follow up of their spouse's pregnancy, in particular, it concerns fathers who would see their child on an ultrasound scan [4].

The decrease in the symptoms of post-traumatic stress occurred faster in working women, as well as in men who did not drink alcohol, having a good education and income, as this enhanced their psychological protective mechanisms [4]. In contrast, the alcohol or psychoactive substances consumption increases the risk of post-traumatic stress disorder in men. In people using psychoactive substances, manifestations of post-traumatic stress disorder double as compared to the general population [4, 6]. The state of mental health deteriorates significantly in people simultaneously suffering from the post-traumatic stress disorder and beginning to use psychoactive substances [6, 31].

In a study focusing on the level of stress after a child loss, the stress level in women whose pregnancies resulted in a loss between the 22nd and 29th gestation weeks and after the 38th week was found to be higher than in those women who had a pregnancy loss between the 30th and 37th weeks.

It is believed that the increased level of stress in the loss of a child between the 22nd and 29th weeks is associated with unexpected pathological causes. Thus, premature birth is an important factor in the development of post-traumatic stress disorder associated with pregnancy and childbirth [4]. Mothers perceive premature birth as a threatening event, and often parents fear that the child may die [6]. After the 38th week of pregnancy with perinatal loss, the increased level of post-traumatic stress disorder is associated with the fact that at that point of gestation a woman is looking forward to seeing her child and is preparing for a normal outcome of pregnancy [4]. Also, the symptoms of post-traumatic stress disorder associated with pregnancy and childbirth were less pronounced in those men who saw their children after birth [4].

In a study of parents whose newborn had stayed in the intensive care unit, at the time of the baby's discharge, more than half of the fathers and over 60% of mothers reported that they had feared the child would die. The parents whose baby has survived feeling grief was similar to the response of parents who faced perinatal loss [6]. Of the 94 mothers whose babies had stayed in the intensive care unit, after their baby discharge 89 mothers reported that they used to have involuntary traumatic memories, the most common of which was experiencing the memory of their child possible death [6].

In some cases, parents did not give a name to their child fearing that he might not survive. Such manifestations at first can indirectly facilitate the emotional state of parents whose child is in the resuscitation unit, but it can also interfere with the development of child-parent attachment, with the development of an avoidance type of attachment [3, 6]. In some cases, mothers preferred not to visit the intensive care unit and not to see their baby [6]. During the first 24 hours after delivery 76% of mothers who have given birth to a term newborn experience feeling of love for their child, compared to 31% of those who have given birth to a pre-term newborn. Half of the mothers of premature newborns had a 2-month delay in developing love for their child [6]. Both parents of a child with a very low body weight have a higher level of postpartum post-traumatic stress than the parents of a full-term infant [18].

Mothers whose child was born with a very low body weight have an increased risk of acute stress disorder (ASD), and subsyndromal levels of post-traumatic stress are equally high in both parents whose child was born with a very low body weight. The decreased number of mother's visits to the intensive care unit may result from her reaction to the traumatic event — the birth of a very low body weight baby [18]. Traumatic stress can limit parents' perception of information concerning the child's condition or the treatment measures [18]. According to the literature, after a perinatal loss, women have a higher risk of developing post-trauma-

tic stress disorder associated with pregnancy and childbirth than men [4, 10]. From 18 to 78% of mothers whose baby was born prematurely are known to experience at least one symptom of PTSD [24].

Thus, a psychiatric history of a mother, as well as traumatic events in her life, tend to play an important part in the development of PTSD associated with pregnancy and childbirth. They appear to be its predictors. If a confirmed mental illness is already present, the patient's therapy should be under a strict control. This should be taken into account when working with these patients.

In our opinion, parents whose child was born premature and possibly with a somatic pathology, and staying in the resuscitation or intensive care unit should be separated into a special risk group. It should be considered by specialists in the perinatal departments who should develop measures to reduce the chances of post-traumatic stress disorder in this group of patients.

SOCIO-ECONOMIC FACTORS AND AVAILABILITY OF SOCIAL AND FAMILY SUPPORT

It is necessary to note a number of important socio-economic factors that can further increase the level of stress during pregnancy and after childbirth, they are: parents' young age, low income, low level of education, their unemployment/ no occupation, poor quality housing, living in disadvantaged areas [4, 8, 10, 17, 30].

In rare cases, in certain cultures birth of a child of a non-desired sex can aggravate manifestations of postpartum affective disorders [30].

One of the main risk factors and predictors of the development of post-traumatic stress disorder associated with pregnancy and childbirth is lack of social and family support. It includes problems in marriage, single mother/ pregnant woman, lack of a positive response to pregnancy from the father of the future child and close friends or relatives, lack of a health professional nearby who could answer questions of interest, chronic somatic diseases present during pregnancy [17, 30]. Moreover, the lack of social support is a stronger predictor of post-traumatic stress disorder than a previous traumatic event [6, 8]. Insufficient marital support, as well as insufficient social support, contributes to the increase of symptoms [23]. Social support can have a stress-buffering effect (it can reduce the influence of stress factors on a person) by suppressing stress reactions, such as an inflammatory response to stressors and weakening the activity of the sympathetic and hypothalamic-pituitary-adrenal axis. Women with insufficient social support are more likely to have concerns about childbirth and assess the child delivery process as negative [15].

RECOMMENDATIONS FOR MEDICAL STAFF OF OBSTETRIC INSTITUTIONS

It is important to clarify the medical history data concerning psychopathologically burdened heredity and presence of any psycho-traumatic factors and situations both during pregnancy and throughout the patient's life. Screening should be conducted to identify risk groups, since post-traumatic stress disorder associated with pregnancy and childbirth may not have been diagnosed or diagnosed incorrectly [8, 13, 35, 37]. This impairs the quality of patient's life, the functioning of the mother-child dyad and the well-being of the family as a whole [7, 13, 39, 40].

In order to detect post-traumatic stress disorder, medical staff of obstetric institutions should pay special attention to patients with a confirmed psychiatric illness, personality disorders included. It is essential to identify patients with behavioral disorders showing pronounced negative emotions. It is important to encourage manifestations of goodwill and positive emotions in parents experiencing stress due to the birth of a child and its condition [6].

In order to detect post-traumatic stress disorder during pregnancy and after childbirth, medical staff of obstetric institutions should closely monitor parents with low spirits, aggressive trends. It is possible to use special questionnaires used to detect classical post-traumatic stress disorder, as well as various modifications of these questionnaires for the period of pregnancy and the postpartum period [6].

A promising objective is to create new questionnaires specifically for post-traumatic stress disorder associated with pregnancy and childbirth. These questionnaires can be answered by the patients themselves or by a mental health specialist. It is also possible to adapt and validate some foreign questionnaires for this purpose [9].

If a pronounced mental health disorder of the mother is found out, it is necessary to consult a psychiatrist and, in rare cases, to take the mother to a psychiatric hospital [13]. The severity of clinical manifestations of post-traumatic stress disorder, as well as of other mental disorders during pregnancy and after childbirth can be perceived differently by the patient and the staff, so in each case an individual approach is necessary in assessing the severity of symptoms [14].

It has been shown that psychoeducation during pregnancy, cognitive psychotherapy, visiting groups teaching relaxation during childbirth, significantly reduce fear of childbirth and the number of caesarean section interventions [15, 25, 27]. One of the risk factors for post-traumatic stress disorder associated with pregnancy and childbirth is lack of a health professional who could answer questions concerning pregnancy, the infant's stay in the resuscitation or intensive care unit [17]. Thus, there is an urgent need to work out special

measures diminishing anxiety in parents whose child is in the intensive care unit. There should be specially trained staff or an opportunity to communicate with the doctors more often, so that patients' questions could be promptly replied. [23]. The effectiveness of calm non-verbal music has been proven for parents suffering from stressful experience. It can also be used, against the background of the baby's stay in the resuscitation unit, in clinical practice [29].

With timely and quality medical care, including, availability to consult a psychiatrist, psychotherapist, the risks of development and manifestation of post-traumatic stress disorder associated with pregnancy and childbirth, as well as other mental disorders of the postpartum period becomes significantly reduced [17]. It is very important to study the mother's mental state, and it is also important to develop a successful progress of relations in the mother-child dyad [3].

Thus, post-traumatic stress disorder associated with pregnancy and childbirth is a unique type of classical post-traumatic stress disorder and this nosology requires a further detailed study, development of clear diagnostic criteria, competent differential diagnosis within the range of other mental disorders of the postpartum period, as well as the pregnancy period. In our opinion, it is necessary to involve specialists of different profiles for a more detailed study of post-traumatic stress disorder associated with pregnancy and childbirth in order to create preventive measures, as well as to develop a plan for referring patients to specialist staff if a psychopathology was revealed during pregnancy and after childbirth, since the well-being of the mother-child dyad, the well-being of the family and further well-being of future generations depend on competent and timely medical care.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

Competing interests. The authors declare that they have no competing interests.

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Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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