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Posttraumatic stress following pregnancy and childbirth

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GENERAL INTRODUCTION *PSYCHIATRIC DISORDERS DURING PREGNANCY AND POSTPARTUM*

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GENERAL INTRODUCTION:

PSYCHIATRIC DISORDERS DURING PREGNANCY AND POSTPARTUM

Pregnancy, childbirth and the postpartum period are supposed to be joyful times. However, they are also major life events that require many adjustments due to the new role of being a mother, which is accompanied by many physiological and hormonal changes. The transition to parenthood after having given birth is challenging for both women and men as a result of sleep deprivation, adjustments in conjugal relationships, new or increased parental responsibilities, potential physical trauma and traumatic experiences, and possible problems with (breast-)feeding or other child-related worries. While most adjustment issues are transient and within the normal range of difficulties, the development of psychiatric symptoms in women during pregnancy and after childbirth is not uncommon. Approximately 10% of women experience a major depressive episode during pregnancy or postpartum^{1,2}, 12% meet the diagnostic criteria for an anxiety disorder³, 7.5% have severe fear of childbirth^{4,5}, and 1-2% develop a posttraumatic stress disorder (PTSD) following childbirth.⁶ Sometimes these conditions are specifically linked to pregnancy and childbirth, and in other cases they are unrelated to pregnancy, and simply reflect the occurrence of mental disorders among women in their reproductive ages. Nonetheless, these conditions not only affect the women involved, they may also prevent secure attachment of the infant and affect the relationship with the partner.^{7,8} Depending on the definition used and causality assumed, suicide and psychiatric disorders may be considered one of the leading causes of (late) maternal mortality in developed countries.⁹⁻¹¹

The focus of this thesis is 'PTSD following childbirth'. In order to place this topic in a context with other psychiatric disorders, to understand the similarities and differences in underlying mechanisms, and to consider the effects of possible co-morbidities, this chapter provides a comprehensive overview of psychiatric disorders with characteristics specific to the peripartum period. Traditionally, literature distinguishes three postpartum psychiatric conditions: the 'maternity blues', postpartum depression (often incorrectly referred to as *postnatal* depression), and puerperal psychosis. This, however, is an oversimplification of reality¹². This chapter reviews a number of psychiatric disorders that frequently have their *onset or an increased prevalence* during pregnancy or postpartum, or often *intensify* during the peripartum period, and/or have *characteristics and symptoms* that are specific to pregnancy and puerperium. These include two categories of disorders and symptoms:

1. *Mood disorders*, including major depressive disorder (MDD), bipolar disorder, puerperal psychosis, and 'maternity blues';
2. *Anxiety disorders*, including obsessive-compulsive disorder (OCD), fear of childbirth (FoC), and PTSD.

Each section will review the main characteristics and symptoms of the condition, diagnostic tools, prevalence in the general population as well as during pregnancy/postpartum, risk factors, possible consequences, treatment options and prevention strategies. The most important facts are summarized in table 1.

Two fields of study fall beyond the scope of this chapter: stress during pregnancy, and psychopathology without distinct features during the peripartum period. Firstly, much is known regarding the biological and psychological pathways by which 'stress' and psychosocial problems (relationships, finances, work), not related to a psychiatric disorder, may affect pregnancy and delivery outcomes. Although the impact of these should not be underestimated, this chapter solely focuses on psychiatric conditions. Secondly, the characteristics of some psychiatric disorders are not distinctly different during pregnancy and the postpartum period than before pregnancy. Although women previously diagnosed with eating disorders, substance abuse disorders, attention deficit hyperactivity disorder (ADHD), personality disorders etc. may experience pregnancy, childbirth and puerperium as stressful periods, their conditions do not necessarily intensify or give rise to problems different from women without previously diagnosed mental disorders. Moreover, research into the manifestation of these conditions in the peripartum period is limited. Nonetheless, preconceptional counseling, vigilance with respect to potential derailment, and interventions to prevent exacerbations in the peripartum period should be included in the antepartum care these women receive. A recent Dutch study found that gynecologists' detection rate of women 'at risk' based on psychiatric history, current depressive symptoms, use of psychotropic medication, psychosocial stressors and substance abuse is about 1 in 5.¹³ An initiative worth mentioning in this context are the Psychiatric-Obstetric-Pediatric (POP)-outpatient clinics that many hospitals in The Netherlands have established for women with pre-existing (as well as new) mental health conditions. In addition to gynecologists, psychiatrists and pediatricians, other relevant health care providers, such as social workers, psychiatric nurses and infant mental health specialists are involved in order to organize and coordinate care for expecting mothers and newborns.

MOOD DISORDERS

Whereas postpartum depression has, in part due to media attention, gained significant attention over the past years, a strong association has been reported between the occurrence of depression before and during pregnancy and depression during the postpartum period.¹⁴ In a considerable number of cases, women already suffer from depression during pregnancy, or even before conception. Puerperal psychosis may be defined as a 'brief psychotic disorder with postpartum onset' according to the diagnostic and statistical manual of mental disorders, 4th edition (DSM-IV¹⁵), but will be discussed in this section on mood disorders given its strong association with bipolar disorder.^{16,17} Finally, maternity blues comprises a set of symptoms frequently experienced by women during the first two weeks postpartum. It is not a psychiatric disorder, but a self-limiting condition that usually does not require treatment.

Table 1. Psychiatric disorders and symptoms specific to the peripartum period

	typical manifestation	prevalence	symptoms	self-report	treatment	note
	<i>pregnancy</i>			measures		
	<i>postpartum</i>	(%)				
<i>Mood related</i>						
Major Depressive Disorder (MDD)	yes	7-13 ^{1,2}	Depressed mood, loss of interest and pleasure in activities previously enjoyed. Altered sleep pattern, concentration, appetite, and feelings of guilt ¹⁵	EPDS (29)	Pharmacotherapy (SSRI) ¹²³ CBT/ Psychotherapy ^{123,239}	Frequent overlap with (physiological) somatic pregnancy complaints
Bipolar disorder (BD)	yes	1-2 ^{125, 126}	Depressive episodes (see MDD) in conjunction with manic episodes: inflated self-esteem/grandiosity, little sleep, keeps talking, racing thoughts, distractibility, increase in goal-directed activity/ psychomotor agitation, excessive involvement in pleasurable activities that have a high potential for painful consequences ¹⁵	-	Pharmacotherapy (mood stabilizers (lithium), antipsychotics, antidepressants) ¹³² anticonvulsants) ¹³² CBT, IPT, FFT ¹⁴⁹	High risk (40%) of puerperal psychosis ^{17,128,129}
Puerperal psychosis (PP)	no	0.1-0.2 ^{153, 154}	Confusion, depersonalization, misrecognitions, loss of connection to reality, delusions, hallucinations, sleep deprivation, agitation, disorganized behavior, suspiciousness, thoughts or actions to harm oneself or the baby ^{128,150}	-	Pharmacotherapy (antipsychotics, mood stabilizers (lithium), anxiolytics (benzodiazepines)) ^{157,159} Electroconvulsive treatment ^{157,158}	Related to bipolar disorder ^{17,128} Recurrence rate without medication 40-60% ^{17,160} .
Maternity blues	no	15-85 ¹⁶²	Incontrollable tearfulness, mild depressive symptoms, anxiety, unstable moods, sorrow/weeping, and confusion ^{163,164}	-	Not necessary (self-limiting)	3-fold increased risk PPD or anxiety disorder ¹⁶⁶

<i>Anxiety related</i>							
Obsessive Compulsive Disorder (OCD)	yes	< 4 weeks	4 ¹⁷²	Obsessions (contamination, harming the infant) and compulsions (washing/cleaning, checking, avoidance) ¹⁷¹	-	SSRI ¹⁸⁴ CBT ¹⁸⁴	Peripartum period marks onset of disorder in 24-29% of women with OCD ^{178,179}
Fear of childbirth (FoC)	yes	yes*	7.5 ^{4,5,187}	Continuously dreading upcoming labor and delivery, anticipation of the delivery provokes an anxiety response (such as a panic attack), attempts to avoid childbirth (request for elective cesarean, pregnancy termination) ¹⁵	WDEQ ⁸⁹	Psychotherapy ^{194,195}	Most often fear of negative appraisal, loneliness, lack of self-efficacy, lack of positive anticipation and death/injury/handicap of the infant ¹⁹⁰
Posttraumatic stress disorder (PTSD)	yes*	yes	1-2 ⁶	Delivery (subjectively) experienced as traumatic; re-experiencing/intrusions, avoidance, numbing of affective responses, hyperarousal ¹⁵	TES-B ²⁰⁰ PSS-SR ²⁰¹	EMDR ²³⁷ CBT ²³⁸	Co-morbidity with PPD 50% ¹⁹⁸ More common in women with depression and fear of childbirth ¹⁹¹ and after preterm delivery, emergency CS ²²⁰

Abbreviations:

CBT, cognitive behavioral therapy; CS, cesarean section; EMDR, eye-movement desensitization and reprocessing; FFT, family focused therapy; FoC, fear of childbirth; MDD, major depressive disorder; OCD, obsessive compulsive disorder; PPD, postpartum depression; PTSD, posttraumatic stress disorder; SSRI, selective serotonin reuptake inhibitor (category of anti-depressants)

* secondary to a prior traumatic delivery experience

Depression

Characteristics and Diagnosis

Major depressive disorder (MDD) is characterized by depressed mood and diminished interest or pleasure in activities that were previously enjoyed (anhedonia). Additional symptoms may include (a) insomnia/hypersomnia; (b) weight or appetite loss/gain; (c) psychomotor agitation/retardation; (d) fatigue or loss of energy; (e) feelings of worthlessness or inappropriate guilt; (f) diminished concentration or indecisiveness; (g) recurrent thoughts of death or suicide.¹⁵ At least five of these symptoms should be present simultaneously for two weeks or more, and they must include depressed mood or anhedonia.¹⁵ Minor depressive disorder is a mood disorder in which at least two depressive symptoms are present for two weeks, but in which the full criteria for MDD have not been met.¹⁵ Mood and cognitive symptoms (sadness, loss of pleasure/enjoyment, irritable or anxious mood, pessimism, difficulty concentrating, lack of involvement, and fatigue) appear to be more common in minor depressive disorder than neurovegetative symptoms (changes in sleep/weight/appetite, psychomotor agitation/retardation and suicidal thoughts).¹⁸

While the criteria for depression during or outside the peripartum period do not differ, the DSM-IV does contain a specific category (code) for mood disorders “with postpartum onset”, implicating that symptoms should commence within the first four weeks following childbirth. It is often argued to extend this period to three, six or twelve months after delivery, since elevated relative risks for first-time psychiatric hospital admission or outpatient contact have been found up to five months following childbirth compared to non-puerperal females in the same age group.¹⁹ Although a vast body of literature is available on postpartum depression, researchers still do not agree whether depression during the peripartum period should be considered a distinct disorder or as an episode of ‘regular’ major depressive disorder that happens to have its onset during the peripartum period.²⁰⁻²⁵

Assessment of depressive symptoms can be performed by psychologists or psychiatrists by means of a clinical interview such as the *Structured Clinical Interview for DSM-IV Disorders (SCID)*²⁶ or *Mini International Neuropsychiatric Interview (MINI)*.²⁷ Trained non-professionals may use the World Health Organization’s *Composite International Diagnostic Interview (CIDI)*²⁸. In outpatient settings, one often chooses to use self-report measures due to their availability and ease in use. These intend to screen for, rather than diagnose, depression. Frequently used instruments include the Edinburgh (Postnatal) Depression Scale (E(P)DS)²⁹, Beck Depression Inventory second edition (BDI-II)³⁰, and Hospital Anxiety and Depression Scale (HADS)³¹. The E(P)DS is the most widely used screening tool in the peripartum period, which has been internationally validated for use during pregnancy³² and postpartum in both women and men.³³ It assesses depressive symptoms during the previous week by means of 10 questions with 4 answer categories (scores 0-3). A cut-off value (sum-score) of 12-13 during the postpartum period²⁹ indicates ‘probable’ clinical depression. For screening during pregnancy, cut-off values ranging from 11³² to 14-15^{34,35} have been suggested in order to obtain an optimal balance between sensitivity and specificity. The BDI-II assesses depressive symptoms

during the preceding two weeks, includes all DSM-IV symptom criteria and allows for differentiation between somatic and non-somatic symptoms. It consists of 21 items containing four statements that reflect increasing symptom severity. A cut-off score of 20 (range 0-63) or more corresponds with moderate depression.³⁰ The HADS is a screening instrument for depression and anxiety. It has been designed particularly for the general hospital (somatic patient) setting, disregarding all possible somatic components of depression and anxiety in order to avoid confounding with symptoms of somatic conditions. It contains 7 items for depression and seven for anxiety, which are each rated on a 4 point scale (0-3). A cut-off value of 8 or more on each scale represents clinically relevant depression or anxiety.³⁶

Mistaking genuine depressive symptoms in the peripartum period for typical somatic discomfort is a common error, and therefore requires diagnostic experience with this patient group. Alternatively, components of physiological pregnancy and postpartum period (changes in sleep pattern and appetite, difficulties concentrating, diminished energy levels) may erroneously be interpreted as somatic symptoms of depression.²¹ As a consequence, physicians' rate of recognition of depression during the obstetric period is low.^{13,37} The unfamiliarity with standardized screening instruments may play an additional role in the infrequent detection of depression by obstetric care professionals.³⁸ What may further complicate an adequate diagnosis is that, even when asked, women themselves may be reluctant to admit that they are not excited about their pregnancy or newborn.

Prevalence

Mood disorders are more prevalent in women than in men, irrespective of pregnancy, fertility status or age. Results of the World Mental Health survey³⁹, for which 72,933 individuals in 10 developed and 5 developing countries were interviewed, revealed that women are 1.8 times more likely to develop MDD at some point in their lives than men. Pregnancy is a time of increased vulnerability for a major depressive episode in women with a history of depression.⁴⁰⁻⁴² It remains a topic of vigorous debate whether or not women are *more likely* to develop a major depressive episode during the peripartum period, and whether pregnancy/delivery is the *cause* of depression. Two large systematic reviews have critically discussed the prevalence of MDD during pregnancy and the postpartum period. Bennett *et al.* (2004)² reviewed 21 studies that used clinical interviews or self-report measures, and calculated 3-month prevalence rates for MDD (including 95%CI) of 7.4% (2.2-12.6), 12.8% (10.7-14.8) and 12.0% (7.4-16.7) for the first, second and third trimesters, respectively. Gavin *et al.* (2005)¹ summarized 28 prospective studies that used clinical interviews or clinical assessment (i.e. excluding self-report questionnaires). At some point during their pregnancy (i.e., 9-month prevalence), 12.7% of women were found to have an episode of MDD, with 7.5% of women reporting the onset of the episode during pregnancy. During the first three months postpartum, the prevalence of MDD was 7.1% and most of these episodes had their onset following delivery.¹

Large population studies that made use of clinical interviews have provided estimates of the 1-year prevalence of MDD in women. Researchers in six European countries and the USA found 1-year

prevalence rates for MDD of 5.3 (n=21425⁴³), 6.9 (n=43093⁴⁴) and 7.7% (n=5554⁴⁵), respectively. The combined findings of these population studies and the abovementioned systematic reviews with 3-month² and 9-month¹ prevalence rates of 13% during pregnancy and 7% postpartum, suggest that MDD is (a) more common during pregnancy than postpartum, and (b) more common in pregnant than in non-pregnant women. However, a large US study³ compared the prevalence of psychiatric disorders in a sample of pregnant (n=453) and postpartum (n=994) women to women who had not been pregnant (n=13025) in the year prior to data collection. *Lower* rates of mood disorders were found among pregnant women than among non-pregnant women, but *higher* rates of MDD in postpartum women than in non-pregnant women (9.3% vs. 8.1%, adjusted OR 1.52, 95%CI 1.05-2.15). Combining the data does not allow for a decisive conclusion on whether or not the prevalence of MDD is increased during pregnancy and postpartum.

Risk factors and consequences

As is the case with most psychiatric disorders, risk factors for depression in pregnant and postpartum women seem to be similar to the risk factors for depression in non-pregnant women. *Somatic causes* for depressed mood should always be evaluated in women presenting with postpartum depression. Several studies have demonstrated associations between clinical and subclinical thyroid dysfunction and depression during pregnancy or the postpartum period.⁴⁶⁻⁵² Furthermore, observational and experimental data suggest that reproductive hormonal changes during parturition and the postpartum period (notably estradiol and progesterone) may trigger depression in a subgroup of women sensitive to the mood destabilizing effects of gonadal hormones.^{53,54} A recent US study found that vitamin D deficiency was associated with clinically significant symptoms of depression in pregnant African American women (OR 0.54, 95%CI 0.29-0.99).⁵⁵ With respect to *psychological factors*, literature has previously described that women with a history of depression are at an increased risk of relapse during pregnancy.⁵⁶ Risk factors for postpartum depression further include previous (postpartum) depression, depression during pregnancy, prepartum distress, social isolation and disturbed relationships.⁵⁷

The association between MDD during the peripartum period and poor outcomes, which may affect both mother and child, warrant vigilance and screening of women for (increased risks of developing) depression. *Depression during pregnancy* is associated with unhealthy parental behaviors⁵⁸, preeclampsia⁵⁹ and higher rates of postpartum depression.⁶⁰⁻⁶² Whether or not depression may cause preterm birth is controversial. A meta-analysis⁶³ summarized the findings of 20 studies to a relative risk of 1.13 (95%CI 1.06-1.21), but noted that effect sizes in studies using dichotomous measures of depression were larger than in studies with continuous measures. Other studies compared depressed women, women using selective serotonin reuptake inhibitors (SSRIs), and healthy pregnant controls, and found no increased risk of preterm birth (OR 1.2, 95%CI 0.68-2.10⁶⁴; OR 1.1, 95%CI 0.77-1.59.⁶⁵ Recent findings (Quispel, submitted) suggest that both depression and preterm birth may have similar predictive factors (among which low education level) that give

an increased likelihood for preterm birth, rather than depression being the cause of an increased incidence of preterm delivery.

Postpartum depression has been associated with serious disturbances in mother-child interaction, i.e. less sensitivity and engagement of the mothers and less responsiveness to the infants⁸, thoughts of harming the child and the use of harsher punishments^{66,67}, compromised care giving activities, e.g. cessation of breastfeeding, feeding difficulties, unhealthy sleep routines and fewer vaccinations.⁶⁸⁻⁷² Furthermore, children of depressed mothers more often show poor cognitive functioning, behavioral inhibition, lower social competence, lower school adjustment and emotional maladjustment, as compared to children of healthy mothers.⁷³⁻⁷⁷

Treatment and prevention

Treatment of depression during pregnancy and postpartum is justified, since a state of clinical depression may negatively affect fetal and infant development.⁷⁸ Most applied treatments include pharmacological and non-pharmacological interventions, in addition to psycho-education aimed at promoting a healthy lifestyle. Often, women as well as physicians hesitate to start or continue the use of antidepressant medication during pregnancy, since data on long term effects of antidepressants on the fetal development are not unanimous.⁷⁹ It is therefore necessary to consider the effects of treatments that are potentially harmful for the newborn, against prolonging the state of being mentally unhealthy with possible adverse effects on the fetal and infant development as well. Additionally, in women with a history of depression, the risk of relapse with and without medication should be evaluated in making a decision whether or not to commence or discontinue the use of antidepressants.

Most studies on the use of antidepressants during pregnancy and postpartum focus on selective serotonin reuptake inhibitors (SSRIs), which have a well established efficacy for cases of MDD.⁸⁰ Considerable controversy exists with regard to a potential increased risk of developing persistent pulmonary hypertension of the newborn (PPHN) in infants of women taking SSRIs during pregnancy.^{81,82} Recent data⁸³ suggest a two-fold increased risk of PPHN after SSRI use in pregnancy (OR 2.1; 95%CI 1.5-3.0). However, absolute risks remain very low: 1.2 infants with PPHN per 1000 without SSRI versus 3.0 per 1000 with SSRI. Literature has also suggested that depression itself, rather than SSRI use, may account for the increased incidence of PPHN in depressed mothers⁸¹.

Infants of depressed mothers exposed to SSRIs appear to have a different neurobehavioral profile than women with MDD who did not take SSRIs during pregnancy.⁸⁴ On the long term, similar neurodevelopmental outcomes are to be expected.⁸⁵ Some studies report associations between maternal SSRI usage and childhood psychopathology, for example with autism spectrum disorder (OR 2.5, 95%CI 1.1-5.5).⁸⁶ However, other research suggests that maternal depression predicts child cognitive and behavioral outcome independent of antidepressant usage^{87,88}, and also that fetal

neurodevelopmental programming is influenced by maternal depression, without mediating effects of SSRI use.⁸⁹

SSRIs have also been said to increase the risk of congenital malformations. However, recent research⁹⁰ comparing women exposed to SSRIs throughout the first trimester of pregnancy and women who discontinued antidepressants prior to conception, found similar rates of major congenital malformations and cardiac defects in both groups, but a twofold increase compared to women who had not used SSRIs during or shortly before pregnancy. The study concludes that there may be other confounding factors in women with an indication for SSRI use.

Whether or not SSRI use during pregnancy increases the risk of preterm birth is controversial. A US study (n=2793)⁶⁴ found that the use of a SSRI, both with (OR 2.1, 95%CI 1.0-4.6) and without (OR 1.6, 95%CI 1.0-2.5) a major depressive episode, was associated with preterm birth. A Dutch study⁶⁵ (n=7696) also demonstrated that SSRI exposure increased the risk of preterm birth (OR 2.14, 95%CI 1.08-4.25) and affected head growth, while exposure to depression had a negative effect on overall growth. The association between SSRI use and preterm birth seems to be facilitated by the level of depressive symptoms, as well as sociodemographic and lifestyle factors.⁹¹ After adjusting for these factors, exposure to antidepressants during pregnancy (n=699) was not associated with increased risk of preterm birth (adjusted OR, 1.21; 95%CI, 0.87-1.69) or low birth weight (adjusted OR, 0.62; 95%CI, 0.33-1.16) compared to women who did not use antidepressants during pregnancy (n=62696).

The possible role of antidepressants in the prevention of relapse is likely to be dependent on a greater number of previous episodes of major depression⁹² and severity of symptoms, but is nonetheless controversial. One study (n=201) reported that pregnant women with a history of MDD who were not depressed during the first trimester of pregnancy, were more likely to relapse during pregnancy when discontinuing medication shortly before or during pregnancy, as compared to women who continued medication (68 vs. 26%; hazard ratio 5.0, 95%CI 2.8-9.1).⁹³ Another study with similar inclusion criteria (n=778) found that failure to use or a decision to discontinue the use of antidepressants in pregnancy did not have a strong effect on the development of a major depressive episode (hazard ratio 1.14; 95%CI 0.67-1.50) compared to women who used antidepressants throughout pregnancy.⁹² There is no evidence for the efficacy of medication in the treatment of minor depression.⁹⁴

With regard to psychosocial and psychological interventions, a 2007 Cochrane review⁹⁵ concluded that currently, there is insufficient research to conclude whether or not non-pharmaceutical interventions are effective in treating *antepartum* depression. More recently, two pilot studies have been published showing promising results of mindfulness-based stress reduction interventions on symptoms of depression and anxiety in pregnant women.^{96,97} Cochrane reviews revealed that, based on 956 subjects of nine trials combined, psychotherapy and psychosocial interventions are effective

in treating *postpartum* depression.⁹⁸ A meta-analysis⁹⁹ concluded that interventions including an interpersonal therapy (IPT) component were found to have greater improvement in depressive symptoms, compared to control conditions, than interventions including a cognitive behavioral component.

IPT is based on attachment and interpersonal theory¹⁰⁰, and assumes that “patients’ maladaptive communication patterns lead to difficulties in their current interpersonal relationships”.¹⁰¹ In the context of pregnancy and postpartum period, IPT may target the gap between the desired and perceived social support of women.⁴² In comparison to parenting education program, IPT was associated with a reduction in the risk of depressive symptoms among pregnant women with diagnosed MDD.¹⁰² IPT during pregnancy as compared to enhanced care as usual, led to significant reductions in depressive symptoms and MDD diagnoses during pregnancy and postpartum, and showed significant improvements in social functioning at six months postpartum.¹⁰³ Among women with PPD, IPT resulted in a significantly greater proportion of recovery (defined as a BDI score of 9 or lower) compared to waitlist-controls (43.8% and 13.7%, respectively).¹⁰⁴ It also appears that the effects of IPT remain over a longer period of time.¹⁰⁵

A multitude of complementary and alternative medicine treatments for MDD have been evaluated, some of which have also been conducted in pregnant and postpartum women, usually on a small scale. Several reviews¹⁰⁶⁻¹⁰⁹ have summarized research on the possible role of *omega-3 supplementation* in treatment and prevention of antepartum and postpartum depression, concluding that evidence is ambiguous. *Light therapy* is a well established treatment option for MDD outside pregnancy and the postpartum period.¹¹⁰⁻¹¹² Women with MDD during pregnancy report significantly lower relapse rates when receiving light therapy when compared to women who receive regular ‘ineffective’ light.¹¹³ The effects of *hormone therapies* (estrogen, progesterone) on treating and preventing depression during pregnancy and postpartum are insufficiently researched.^{114,115} A systematic review¹¹⁶ concluded that the effects of *acupuncture* as monotherapy and antidepressants were comparable with respect to improving clinical response and alleviating symptom severity of MDD, but the results of acupuncture were not different from sham acupuncture. Studies involving pregnant women with MDD found greater symptom reduction in acupuncture treatment groups than in waitlist-controls or women receiving massage therapy. However, the differences between women receiving depression-specific acupuncture and control (non-specific) acupuncture were not always statistically significant.^{117,118} Case series and pilot studies have provided limited evidence for the efficacy and safety of *electroconvulsive therapy* (ECT) in pregnant¹¹⁹ and postpartum¹²⁰ women with severe depression, who were unresponsive to pharmacological treatment and often have additional psychotic features.

Prophylaxis with antidepressants seems to be effective to prevent MDD¹²¹⁻¹²³, and it is therefore necessary to identify those at risk of developing MDD. A comprehensive Cochrane review concluded that there is insufficient evidence for the use of psychosocial interventions to prevent MDD.¹²⁴

However, identifying and focusing psychosocial interventions on mothers 'at-risk' for PPD is more effective in preventing PPD (RR 0.67, 95%CI 0.51 to 0.89) than targeting all women (RR = 0.87, 95%CI 0.66 to 1.16).¹²⁴

Bipolar disorder

Characteristics and diagnosis

Bipolar disorder (BD) is a mood disorder characterized by manic episodes, often alternated with depressive episodes – hence its previous term 'manic depression'. The DSM-IV¹⁵ distinguishes 2 types of BD: Bipolar I disorder, during which individuals have experienced at least one manic or mixed episode; Bipolar II disorder, during which individuals have experienced one or more hypomanic episodes in addition to at least one depressive episode (as described under MDD). A (hypo)manic episode is characterized by at least three of the following seven symptoms: (a) inflated self-esteem or grandiosity; (b) decreased need for sleep; (c) pressure to keep talking; (d) flight of ideas or subjective experience that thoughts are racing; (e) distractibility; (f) increase in goal-directed activity or psychomotor agitation; (g) excessive involvement in pleasurable activities that have a high potential for painful consequences. Hypomanic episodes do not extensively impair daily life (social and professional) functioning, do not require hospitalization and do not include psychotic components¹⁵, which makes them easier to go unnoticed by health care professionals than manic episodes.

Prevalence

Epidemiological studies estimate lifetime prevalence rates of 0.6–1% for bipolar I disorder, and 0.4–1.1% for bipolar II disorder.^{125,126} A substantial amount of women experience a relapse during pregnancy (22%) or postpartum (24%), despite adequate medication in most cases.¹²⁷

Risk factors and consequences

Clinicians should be vigilant of the close link between BD and postpartum psychosis (PP)¹⁶: 40% of women with BD develops PP^{17,128}, which is a 100-fold increase when compared to non-bipolar women.¹²⁹ In some women a postpartum psychosis marks the onset (i.e. is the first episode) of later diagnosed bipolar disorder.^{17,128} Among women with BD, the likelihood of developing PP is doubled in case of a family history of PP.¹⁷ BD has been associated with adverse pregnancy outcomes, as a recent study found that induction, elective cesarean section and neonatal hypoglycemia were more common among women with BD, regardless of whether or not they used mood stabilizers.¹³⁰

Treatment and prevention

A wide range of pharmacological treatments are available for those suffering from BD. A key component in the effective management of BD patients is the mood stabilizer lithium, also during pregnancy and postpartum.¹²⁷ The risk of relapse during pregnancy is approximately doubled in

women without medication (40-85.5%), compared to women using medication (19-37%).^{127,131} Depending on the mental state of the patient (mania/depression; acute/prophylaxis), additional drugs can be prescribed, including atypical antipsychotics, antidepressants and anticonvulsants.¹³²

Weighing the risks and benefits of continued use of medication during pregnancy versus discontinued pharmacological treatment should be done with care, as is the case with depression. Untreated bipolar disorder has been associated with preterm birth and low birth weights.¹³³ The overall incidence of congenital defects does not seem to be altered with the use of lithium, although there is evidence that the incidence of cardiac malformations is increased^{134,135}, and anecdotal evidence suggests increased risks of other conditions as well¹³⁶. Furthermore, monitoring of plasma lithium concentrations and thyroid function is warranted during pregnancy, as lithium may not only deregulate maternal thyroid function¹³⁷, but also increase glomerular filtration rate and creatinin clearance during pregnancy, resulting in lower concentrations of circulating lithium. High serum lithium concentrations prior to delivery have been associated with lower APGAR scores and central nervous system complications in the neonate, with adverse effects proportional to the dosage of lithium, which is the reason that a 24-48 hour interruption of lithium intake prior to delivery has been suggested¹³⁸. Anticonvulsants are known for their teratogenic effects on embryonic and fetal development^{139,140}, whereas antipsychotics increase the risk of gestational diabetes.^{141,142} The long term effects on infant development vary depending on the type of medication, ranging from lower intelligence levels after use of the anticonvulsant valproic acid¹⁴³⁻¹⁴⁵, to macrosomia at birth^{141,146} and deficits in neuromotor development¹⁴⁷ for antipsychotics, to no significant long term effects on growth, cognitive, behavioral and neurological development for lithium¹⁴⁸.

A number of psychological interventions have been found effective for treating bipolar disorder, ranging from cognitive behavioral therapy (CBT) and IPT to family focused treatment.¹⁴⁹ Their effectiveness in pregnancy and postpartum has not researched extensively.

Puerperal psychosis

Characteristics and diagnosis

Characteristics of puerperal psychosis (PP) include confusion, depersonalization, misrecognitions, loss of connection to reality, delusions (false beliefs held with absolute conviction, despite evidence proving otherwise), hallucinations (perceptions in the absence of a stimulus, usually visual or auditory), sleep deprivation, agitation (sometimes manic), disorganized behavior, suspiciousness, and thoughts or actions to harm oneself or the baby.^{128,150} In the DSM-IV, *postpartum (or puerperal) psychosis* is not described as a separate disease entity, and is therefore frequently categorized as either psychotic disorder not otherwise specified, brief psychotic disorder, or mood disorder (manic, mixed, or major depressive episode) with psychotic features, all requiring the specifier “with postpartum onset” (4 weeks or less after delivery).^{127,151,152}

Prevalence

PP is a condition that affects approximately 1-2 per 1000 women after childbirth.^{153,154} The onset is usually within the first two weeks after delivery^{155,156}, with a median of 8 days postpartum.¹⁵¹

Risk factors and consequences

As previously mentioned, a close link exists between PP and bipolar disorder (BD). In addition to BD being a risk factor for the development of PP, PP may also mark the onset of later diagnosed bipolar disorder.^{17,128} Often there is a familial occurrence of PP.¹⁶

Among women with PP, the prevalence of auto-immune thyroid disorder (AITD, defined as elevated concentrations of thyroperoxidase (TPO) antibodies) and clinical thyroid failure (abnormal values of both TSH and fT4) is clearly increased.¹⁵² There was a significant difference between the prevalence of AITD among women with PP at 4 weeks postpartum (19%) versus healthy postpartum controls (5%). Furthermore, at 9 months postpartum, 19% of women with PP were diagnosed with clinical thyroid disease versus 3% of healthy controls. It was suggested that AITD may be an etiological factor for the development of PP, and therefore evaluation of thyroid function including TPO antibodies is warranted.

Treatment and prevention

Management of PP usually includes hospital admittance, to rule out possible organic causes and to prevent suicide and infanticide from occurring. Treatment often comprises a combination of prescription of (atypical) antipsychotic medication, mood stabilizers (lithium), anxiolytics (benzodiazepines), and, in severe cases, electroconvulsive treatment.¹⁵⁷⁻¹⁵⁹ The recurrence rate without treatment is approximately 40-60%.^{17,160} In many cases, prophylactic use of lithium immediately after delivery can effectively prevent a new episode of PP.^{127,161}

Maternity blues

Maternity blues is not a mental disorder, rather, it is a transitory psychological condition experienced by 15-85% of mothers during the first days after childbirth.¹⁶² Characteristics include uncontrollable tearfulness, mild depressive symptoms, anxiety, unstable moods, sorrow/weeping and confusion.^{163,164} The symptoms women experience during the 'maternity blues' have been related to the radical changes in hormone levels immediately postpartum.¹⁶⁵ Symptoms should disappear within two weeks and generally do not require intervention. However, if the symptoms persist, women have an increased risk of developing postpartum depression (20%; OR 3.8, 95%CI 1.2-16.5) or an anxiety disorder (OR 3.9, 95%CI 1.1-20.0).¹⁶⁶

ANXIETY DISORDERS

Both anxiety disorders and mood disorders reveal a higher prevalence in women than in men. The results of the World Mental Health survey³⁹, for which 72,933 individuals in 10 developed and 5 developing countries were interviewed, showed that women are 1.7 times more likely to develop an anxiety disorder at some point in their lives than men. Whereas a vast body of research is available regarding peripartum depression, the literature on anxiety disorders in the peripartum period is far less substantial. Recently, a large population-based study found no significant difference in the prevalence of DSM-IV anxiety disorders between 1,524 women who had been pregnant the year before assessment and 13,025 women who had not (13% and 15%, respectively; adjusted OR, 0.99 (95%CI 0.68-1.43)).³ Importantly, PTSD and OCD were not part of this study. Nonetheless, the physiological, hormonal, and psychosocial changes that occur in the peripartum period may increase perceived stress levels, thereby eliciting symptoms in women vulnerable for developing anxiety disorders. Regardless of the likelihood of an increase in (symptoms of) anxiety disorders during the peripartum period, anxiety is common among childbearing women, and is associated with changes in fetal behavior, a higher incidence of pregnancy complications, and difficulties in adjustment postpartum in both mother and child.¹⁶⁷

Research regarding the precise effects of anxiety disorders during pregnancy on obstetric, fetal and neonatal outcome has yielded varying results. Among others, this is related to differences in sample characteristics, timing, specific measures, and accounting for possible confounders (e.g., 'stress') and protective factors in the various studies. Furthermore, criteria for anxiety varying from higher than average scores on self-report measures, to specific DSM-IV anxiety disorders, to any DSM-IV anxiety disorder have been used. Nonetheless, as a comprehensive review concluded¹⁶⁸, "anxiety symptoms during pregnancy contribute independently of other biomedical risk factors to adverse obstetric, fetal and neonatal outcome".

In practice it is useful and necessary to distinguish between (a) women with a history of anxiety symptoms or a diagnosed anxiety disorder (whose symptoms during the peripartum period may be regarded as recurrent), and (b) women who were (relatively) well adapted before pregnancy, and experience *de novo* anxiety symptoms. In the latter case it may mean the onset of an anxiety disorder, or of pregnancy related anxiety, which is markedly different from general anxiety and depressive symptoms.¹⁶⁹ Three anxiety disorders have characteristics specific to the peripartum period: (1) obsessive-compulsive disorder (OCD) often has its onset in the peripartum period; and with (2) fear of childbirth (FoC) and (3) posttraumatic stress disorder (PTSD) following childbirth the object of women's fear or trauma is related to delivery and childbirth.

Obsessive-compulsive disorder (OCD)

Characteristics and diagnosis

OCD is an anxiety disorder characterized by unwanted, intrusive thoughts and/or images (obsessions) and repetitive physical or mental activities that one feels forced to carry out (compulsions).¹⁵ During pregnancy, OCD often manifests itself as a preoccupation with contamination and symmetry/meticulousness (obsessions) and subsequent repetitive washing/cleaning behavior and checking (compulsions).^{170,171} During the postpartum period, OCD often manifests as intrusive thoughts about harming the infant, or the child dying in its sleep (obsessions), followed by excessive checking (of breathing and heart rate) or avoidant behavior (compulsions).^{171,172} It is important to note that subclinical intrusive, senseless, obsessive thoughts and compulsive behavior are also found in women without OCD, depression, puerperal psychosis or other psychiatric disorders.^{67,171} From a cognitive-behavioral perspective, these thoughts and behaviors become clinically relevant when an individual (mis)appraises such thoughts as highly significant and threatening, and requiring attention to prevent a feared negative consequence.¹⁷³

MDD is the most commonly diagnosed co-morbid diagnosis in non-gravid patients with OCD, with a lifetime prevalence of 60-80%.¹⁷⁴ Women with pre-existing OCD may also be at increased risk of developing postpartum depression.¹⁷⁵ Although both OCD and MDD are associated with negative affect, the obsessions in OCD usually pertain to specific bizarre fears and/or negative consequences, whereas thoughts in depression are pessimistic in general and predominantly concern real life circumstances.¹⁷¹ It is important to distinguish between the different features of aggressive thoughts towards the infant as seen in OCD and puerperal psychosis. Thoughts and behavior in OCD are *ego-dystonic*, causing fear and distress.¹⁷¹ Women with OCD experience their obsessions with harming the child as unwanted, senseless and inconsistent with their typical behavior, they realize that their thoughts and imaginations are the product of their own mind, and will rather avoid the child in response to their own aggressive thoughts than act upon them.

Prevalence

The lifetime prevalence of OCD is estimated at 1.6%.¹⁷⁶ Prevalence estimates of OCD during the peripartum period are scarce. During the third trimester of pregnancy a prevalence of 3.5%¹⁷⁰ has been found, and postpartum incidences of 2.3 and 4% have been reported.^{172,177} The peripartum period marks the onset of symptoms in a substantial number of women diagnosed with OCD. In several small retrospective studies (17-78 patients), 6-39% of women with at least one child connected the onset of their OCD to their pregnancy^{175,178-181}, whereas 0-22% reported their first OCD symptoms to occur during the postpartum period.^{175,178,179,181} Women with preexisting OCD often report worsening of their symptoms during the peripartum period. In various studies, 8-34% of women indicated exacerbations during pregnancy, and 29-50% reported worsening of symptoms during the postpartum period.^{175,178,179}

Risk factors and consequences

Neurobiological substances that are thought to be involved in the etiology of OCD include serotonin and oxytocin. In a substantial number of women, the onset or worsening of OCD seems to be related to reproductive cycle events, especially postpartum and menarche.^{178,180} Furthermore, 20-50% of women report worsening of OCD during the premenstrual period.^{175,178} This observation has led to the hypothesis that fluctuations in estrogen and progesterone levels may cause OCD symptoms through dysregulation of the serotonergic system.¹⁸² Moreover, increases in oxytocin during the third trimester of pregnancy and postpartum are related to the increase of OCD symptoms during that period.¹⁸³

Treatment and prevention

Treatment options of OCD during the peripartum period include psychotherapy (CBT), and, if this proves insufficiently effective, pharmacotherapy (SSRIs).¹⁸⁴ The risks and benefits of SSRI usage in women during pregnancy and lactation have been discussed in the section on MDD. The focus during CBT lies on exposure to feared situations and prevention of compulsive responses. In non-postpartum populations, the combination of both treatments has been shown to be most effective¹⁸⁵, but in postpartum populations no RCT's have been conducted yet.

Fear of childbirth (FoC)

Characteristics and diagnosis

Fear is a common reaction to childbirth, which demands much from the biological, psychological and social abilities of the pregnant woman.¹⁸⁶ In a significant minority of women, this healthy, functional apprehension takes the pathological, impairing, distressing form known as 'severe fear of childbirth' or tocophobia.^{187,188} These women meet the DSM-IV criteria for specific phobia¹⁵ if they continuously dread the upcoming labor and delivery, even though they realize that their fear is excessive and unreasonable; anticipation of the delivery provokes an anxiety response (such as a panic attack), and they try to avoid childbirth (e.g. by demanding an elective cesarean, avoiding or terminating pregnancy) and/or suffer throughout childbirth with intense fear. One could distinguish between *primary* and *secondary* FoC, with the former occurring in nulliparous women who have never given birth, and the latter in multiparous women following a previous traumatic delivery experience. Screening for FoC can be done with the use of the Wijma Delivery Expectations/Experience Questionnaire (WDEQ), a validated, frequently used, easily-administered self-report questionnaire.¹⁸⁹ A sum-score of 85 or higher indicates severe FoC. Several domains have been identified around which the fear is centered. Factor analysis identified 6 factors that comprise the 'FoC' construct¹⁹⁰: (a) (general) fear, (b) negative appraisal, (c) loneliness, (d) lack of self-efficacy, (e) lack of positive anticipation and (f) concerns for the child. Similar results were obtained by Huizink¹⁶⁹, who found that women fear not only giving birth, but also bearing a handicapped child, and they are concerned with their appearance.

Prevalence

FoC is more common in nulliparous women than in multiparous women.^{4,5} In unselected samples, severe FoC is reported by approximately 7.5% of women. A Norwegian study⁴ among 2206 women found a prevalence of 7.5% for severe FoC (WDEQ-A ≥ 85), further subdivided into 9.0% of nullipara and 5.9% of multipara ($p=0.009$). In a Finnish cohort of 1400 women, 7.4% revealed a WDEQ-A score of ≥ 100 ⁵, which could be subdivided into 7.0% of nullipara and 7.7% of multipara (p -value not mentioned), although median WDEQ scores of nullipara were higher than multipara (72.0 vs. 65.4, $p<0.001$). This study also used a visual analogue scale (VAS) to screen for FoC, by asking women to indicate on a scale from 1 to 10 “how afraid [they were] of childbirth”. The VAS showed a sensitivity of 97.8% and specificity of 65.7% in screening for FoC (WDEQ ≥ 100) with a VAS threshold of 5.0. In a sample of 30480 healthy nulliparous Danish women with a singleton pregnancy, 7.5% answered the question “Are you anxious about the course of the upcoming delivery?” with “a lot”.¹⁸⁷

Risk factors and consequences

Risk factors for FoC include a history of depression and of sexual abuse, low self-esteem and coping abilities, poor social support system, as well as a previous traumatic delivery experience.¹⁸⁷ Labor duration is significantly longer in women with severe FoC.⁴ Additionally, women with FoC have a six-fold increased risk of developing PTSD.¹⁹¹ Furthermore, several studies find an increased risk of emergency cesarean section in women with severe FoC. In a sample of 25,297 healthy nulliparous Danish women in spontaneous labor with a single fetus in cephalic presentation at term following an uncomplicated pregnancy, FoC (as measured at 16 and 31 week pregnancy) was associated with emergency cesarean section (OR 1.43, 95%CI 1.13–1.80).¹⁹² In a sample of 1,981 Swedish-speaking women (both nulliparous and multiparous), women with FoC were more likely to undergo emergency cesarean section than women without FoC (OR 3.0, 95%CI 1.4-6.6).¹⁹³

Treatment and prevention

Research into optimal intervention and prevention strategies with respect to FoC is ongoing. A limited number of studies have found promising effects (reduction of elective cesarean requests, shorter duration of labor) through the use of individual psychotherapy and group psycho-education and relaxation.^{194,195}

Posttraumatic Stress Disorder (PTSD)

Characteristics and diagnosis

PTSD is an anxiety disorder that can develop after exposure to a traumatic stressor. In order to diagnose PTSD following childbirth, specific criteria have to be met, as described in the DSM-IV, outlined in table 2.¹⁵ In addition to symptoms of re-experiencing, avoidance/ numbing and hyperarousal, the diagnosis of PTSD requires a genuine or perceived threat to the life of self or others; that the threat elicited a subjective response of intense fear, horror, or helplessness; that the symptoms persist for at least a month; and that the symptoms interfere with daily life functioning. PTSD commonly co-occurs with major depressive disorder^{196,197}, and is often seen in conjunction

with postpartum depression in puerperal women.^{198,199} As with other disorders, the SCID²⁶ or MINI²⁷ can be used by psychiatrists and psychologists to diagnose PTSD. Additionally, numerous self-report instruments are available, some of which have been designed specifically for PTSD following childbirth²⁰⁰, whereas others are generic questionnaires that can be used to diagnose PTSD following a variety of traumatic events²⁰¹⁻²⁰³ or broad instruments that contain PTSD-related items.^{204,205}

Table 2. DSM-IV diagnostic criteria for PTSD

A	Stressor	<ol style="list-style-type: none"> 1. Trauma involved actual or threatened death/serious injury, or threat to physical integrity of self or other 2. Individual responded with intense fear, helplessness and/or horror
	Symptoms	
B	Re-experiencing	<ol style="list-style-type: none"> 1. Recurrent and intrusive distressing recollections of the event 2. Recurrent distressing dreams of the event 3. Acting or feeling as if the event was recurring (e.g., flashbacks, hallucinations) 4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the event 5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the event
C	Avoidance & numbing	<ol style="list-style-type: none"> 1. Efforts to avoid thoughts, feelings, or conversations associated with the event 2. Efforts to avoid activities, places, or people that arouse recollections of the event 3. Inability to recall an important aspect of the trauma 4. Diminished interest or participation in significant activities 5. Feeling of detachment or estrangement from others 6. Restricted range of affect 7. Sense of foreshortened future
D	Hyperarousal	<ol style="list-style-type: none"> 1. Difficulty falling or staying asleep 2. Irritability or outbursts of anger 3. Difficulty concentrating 4. Hypervigilance 5. Exaggerated startle response
E	Duration	One month or more
F	Disability	Symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning

Prevalence

Studies performed between 1 and 6 months postpartum have yielded prevalence estimates of PTSD following childbirth ranging from 0.0% to 5.9%^{200,206-216}, although experts consider 1-2% as a more realistic estimate in developed countries.⁶ Another 22-40% of postpartum women do not meet all criteria for PTSD, but do suffer from one or more clinically relevant symptoms of PTSD.⁶

Risk factors and consequences

Previous studies have identified multiple obstetric, personality and psychosocial factors that promote the development of PTSD following childbirth. Demographic factors such as age, marital status and educational level, on the other hand, were consistently found to be unrelated to PTSD following childbirth.^{200,208,212,213} Women with a history of childhood sexual abuse seem to be at increased risk for developing symptoms of PTSD postpartum.^{217,218} No associations have been observed between parity and PTSD.^{208,209,211-213} A dose-response relationship between the intensity of the event and the risk of developing PTSD has been suggested.²¹⁹ Accordingly, one may postulate that the prevalence of PTSD is higher among women with complicated pregnancies, as these women have often been exposed to stressful interventions and hospitalization of mother and infant. Indeed, obstetric interventions (e.g. emergency cesarean section and instrumental vaginal delivery) did increase the risk of posttraumatic stress symptoms^{191,207,220}, as did complications such as preeclampsia and preterm birth.²²¹⁻²²⁴ However, although the relative risk of developing PTSD following obstetric complications is elevated, in absolute numbers, PTSD is still most prevalent among women with spontaneous vaginal deliveries, during which no medically or objectively identifiable complications occurred.¹⁹¹

While the possible influence of personality characteristics and psychological factors such as general state anxiety, trait anxiety and some specific coping strategies is controversial^{209,211,213,225,226}, strong associations have consistently been found between anxiety/depression during pregnancy and PTSD after childbirth.^{211,212,216} Half of the women with PTSD following childbirth show a co-morbid PPD.^{191,198} There appears to be a concordance between women and their partners in experiencing PTSD symptoms following childbirth, as well as an association between PTSD symptoms and dissatisfaction with partner support.²²⁷ Furthermore, the perceived degree of support, care, and communication from the staff who assisted during labor seem to play crucial roles in the way women reflect on the experience.²¹³ This provides an interesting opening for further research, as obstetric care practice may not merely be targeted at identifying women 'at risk', but also focus on strategies to prevent the development of PTSD that are linked to empathic care, women's involvement in decision making, and strengthening partner support.

Delivery settings substantially influence women's appraisals of childbirth: a recent Cochrane review²²⁸ concluded that, compared to conventional hospital settings, women who delivered in a homelike setting reported higher satisfaction about the birthing process and had lower intervention

rates. Obstetric health care in The Netherlands comprises a fairly unique echelon system. All healthy women with uncomplicated medical and obstetrical histories enter the primary care system, where pregnancy and delivery are monitored by community midwives working independently from hospitals. Only in case of (an increased risk for) well/defined complications or need for interventions during pregnancy or delivery (as defined by national guidelines²²⁹), women are referred to a gynecologist/obstetrician in a hospital. In the primary care setting, women can choose to deliver at home (23%), or in a homelike setting in a hospital or birth center (11%).²³⁰ Women who initially or entirely received prenatal and/or peripartum care from midwives in primary care settings describe their delivery experience as more negative after (a) hospital deliveries (compared to home births), (b) referral to the hospital during labor, (c) emergency cesarean sections and (d) instrumental vaginal deliveries.²³¹

Symptoms in women with PTSD following childbirth usually do not spontaneously fade out.²¹¹ Possible consequences of (untreated) PTSD following childbirth include impaired bonding to the child, problems in the partner relationship²³², avoidance of future pregnancies and demanding an elective cesarean section (due to secondary fear of childbirth) during the next pregnancy.^{195,233,234}

Treatment and prevention

Due to insufficient research thus far (both qualitatively and quantitatively), no standard intervention with proven effectiveness is currently available for women with PTSD following childbirth. International guidelines on the management of PTSD recommend trauma-focused CBT and eye-movement desensitization and reprocessing (EMDR) as the treatments of choice for trauma victims.^{235,236} In women with PTSD following childbirth, a limited number of pilot studies have found promising results of both interventions.^{237,238} There may be a role for pharmacological treatment in cases of severe PTSD (in particular with severe co-morbid depression), in the event of insufficient effects of psychological treatments or after refusal to engage in psychological treatments. However, the evidence for the efficacy of pharmacological treatments (mainly SSRIs) as compared to placebos in the reduction of PTSD symptoms is inconclusive.²³⁵ Considering the possible consequences of PTSD following childbirth for the mother, infant, the partner and future pregnancies, further research into treatment options is of vital importance.

CONCLUSION

While psychiatric disorders may be present in women independent of their reproductive status, a number of disorders and conditions seem to be connected to the peripartum period. As summarized in table 1, these include several mood and anxiety related conditions. These psychiatric conditions carry the potential to have a serious negative impact not only on maternal well-being but also on the mother-child bonding and infant development. Treatment options include a variety of psychotherapeutic and pharmacological interventions, depending on the disorder, severity, potential risk to the fetus or neonate, co-morbidity and individual circumstances.

Maternity blues is the most common state of impaired mental well-being, affecting 15-85% of women during the first days postpartum. Tearfulness, feelings of sadness, anxiety, unstable moods, sorrow/weeping, and confusion are its most characteristic features. Due to the fact that it is generally a transient and self-limiting condition, it is not classified as a psychiatric *disorder*.

Major depressive disorder is characterized by depressed mood and diminished interest or pleasure in activities that were previously enjoyed. Various large studies suggest that the prevalence of MDD is quite similar among pregnant and non-pregnant women (7-13%), whereas there may be an increased risk of MDD with an onset during the postpartum period.

Bipolar disorder is a mood disorder characterized by depressive episodes in conjunction with manic episodes that has a lifetime prevalence of 1-2%. It has a much lower incidence than major depressive disorder, but is clinically relevant during the peripartum period since women with bipolar disorder have a high risk of developing a puerperal psychosis.

Puerperal psychosis is a medical emergency that requires hospitalization in most cases. It is rare (1-2 in 1000 women), but quite common among women with a bipolar disorder or a family history of puerperal psychosis and/or bipolar disorder.

Obsessive compulsive disorder often manifests as a preoccupation with contamination and intrusive thoughts about the infant being harmed (obsessions), with subsequent repetitive washing/cleaning behavior and checking or avoidant behavior (compulsions).

Fear of childbirth may be so severe that women meet the DSM-IV criteria for specific phobia. Approximately 7.5 percent of women report clinically significant fear of childbirth. Cesarean section on maternal request is common, some women even decide to terminate pregnancy, and some avoid becoming pregnant at all.

Posttraumatic stress disorder may occur when labor and delivery have been experienced as traumatic, and women suffer from symptoms of re-experiencing (e.g. nightmares, flashbacks),

avoidance, emotional numbing and hyperarousal. It occurs in 1-2 percent of women following childbirth.

Obstetric care professionals do not always recognize symptoms of these conditions in their patients. This is at least partially due to considerable overlap with normal (physiological) pregnancy and postpartum-related physical inconveniences, as well as reluctance among women to acknowledge that they do not feel elated about their pregnancy or newborn. Furthermore, obstetric care professionals may not explicitly ask for symptoms of mental disorders, because they are lacking knowledge, time, effective screening instruments, affinity with psychopathology, referral options or a combination of these. Mental health workers often have insufficient experience with the characteristic features of common mental disorders in the peripartum period, and the challenges that pharmacological treatment during pregnancy and lactation poses. Awareness, recognition and prompt referral are key to early intervention and prevention of long-term impairment of maternal well-being and adverse effects on mother-child bonding and infant development. Future research warrants evaluation of effective interventions and prevention strategies, as these are insufficiently studied for many of the conditions discussed in this particular, vulnerable population.

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