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Depression in Childbearing Women: When Depression Complicates Pregnancy

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Background and Prevalence

Across the US, prevalence studies show that one in five women will experience an episode of major depressive disorder (MDD) during their lifetime [1]. The onset of depressive symptoms is most often seen between 20 to 40 years old, the age range when many women become pregnant [2]. Studies have shown that 10 to 16% of pregnant women fulfill the diagnostic criteria for MDD, and even more women experience subsyndromal depressive symptoms, which are frequently overlooked [3,4]. Because of this correlation with life events, it is very important for healthcare providers to be aware of: 1) the frequency of depression in this population, 2) signs, symptoms and appropriate screening methods, and 3) health risks for the mother and growing fetus if depression is undetected or untreated. A study by Marcus and colleagues in 2003 found that of pregnant women screened in an obstetrics setting who reported significant depressive symptoms, 86% were not receiving any form of treatment. While most women seek some prenatal care over the course of their pregnancy [5], many women do not seek mental health services due to stigma; thus, antenatal visits to an obstetrician or primary care provider may provide an opportunity for screening and intervention for depression in this high risk group. Since management of the depressed, pregnant woman includes care of her growing fetus as well, treatment may be complicated and primary care providers should consider a multidisciplinary approach including the obstetrician, psychiatrist, and pediatrician to provide optimal care [6].

Clinical Features

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) defines the diagnosis of depression via the same criteria for men and women, although research shows some variation in female presentation. MDD diagnosis must include existence of depressed or irritable mood or inability to experience pleasure. In addition, four of the following symptoms must also be present: feelings of guilt, hopelessness, and worthlessness; sleep disturbance (insomnia or hypersomnia); appetite or weight changes; attention or concentration difficulties; decreased energy or unexplainable fatigue; psychomotor agitation or retardation; and in severe cases, thoughts of suicide [7]. Women may present in clinic with more seasonal depression or

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symptoms of atypical depression (e.g. hypersomnia, hyperphagia, carbohydrate craving, weight gain, heavy feeling in arms and legs, worse mood in the evenings, and initial insomnia) [7]. Many of these symptoms overlap with the physical and mental changes experienced during pregnancy, making it difficult to distinguish, and therefore are often disregarded [8].

Identification in Primary Care

Practitioners caring for women should be aware of personal and epidemiologic factors that place women most at risk for perinatal depression. An important primary risk factor is a previous personal history (particularly during pregnancy or postpartum) or a family history of depression [9]. Another common risk factor is a woman's perception of limited social support and presence of social conflict. Recent literature shows that even when women report adequate social support, if they also report interpersonal conflict, then they are at a high risk for depression [10]. Obstetricians and primary care providers routinely address social support for pregnant women and encourage strengthening their support networks. Interpersonal conflict may be important to address in the clinical interview as well [10]. Asking questions about feeling let down and unloved, feeling tense from arguing, and the frequency of unpleasant and distressing social interactions may be adequate to screen for social conflict and identify women who would benefit from clinical interventions addressing these interpersonal conflicts [10]. Other risk factors for depression include: 1) history of physical, emotional, or sexual abuse; 2) history of (or current) cigarette smoking, alcohol consumption, and/or substance use; 3) stressors such as financial or occupational obligations; 4) stressful health concerns or relationships [11]; 5) living alone; 6) greater number of children; and 7) ambivalence about the pregnancy [12].

Screening

In 2002, the US Preventative Services Task Force (USPSTF) published findings noting that a positive answer to 2 universal depression screening questions: 1) “Over the past two weeks, have you ever felt down, depressed, or hopeless?” or 2) “Have you felt little interest or pleasure in doing things?” or both, was a quick and effective way to screen for depression. Affirmative answers initiate a more in-depth screening tool to gather more information toward the diagnosis [13]. The two most commonly used screening measures for depression for adults in ambulatory care are the Beck Depression Inventory Scale (BDI-II) (two to three minutes to complete) [14] and the Center for Epidemiologic Studies Depression Scale, Revised (CES-DR) (five to 10 minutes to complete) [15].

The Edinburgh Postnatal Depression Scale (EPDS) is a screening tool used internationally to assess depression during pregnancy and postpartum [16]. The EPDS can screen for postpartum depression as early as early as three to five days after giving birth with a score greater than 9.5 [17]. If a woman scores higher than 15 during pregnancy or 13 postpartum, then a further assessment is necessary for a diagnosis of depression [18]. The Role Impairment Screen can assess how depressive symptoms interfere with functioning in different life tasks, and includes questions regarding roles as full participants in prenatal care, functioning in work, home, and intimate relationships, parenting skills for other children, energy levels, and ability to resist smoking, drinking alcohol, and using substances [11]. Screening tools do not address the duration of symptoms, degree of impairment, or co-morbid psychiatric disorders [19]; thus, if a patient scores beyond the cutoff range for any of these tools, DSM-IV diagnostic criteria should be assessed through further interview.

Regardless of whether the practitioner chooses the two question method or a more in-depth screening, the most important factor is to have a protocol in place for screening women and to make it a routine part of the clinical assessment [19]. Once a diagnosis is made in the primary care setting, some practitioners take a collaborative care approach, including nurses and

psychiatrists, for these patients [20]. Under this theory, primary care physicians hand off these cases to nurses ("depression care managers") to provide follow up care. Through frequent contact with the depressed patients they provide education, track adherence with medications and psychotherapy, and make the patient take an active role in their care [20]. In this model, if the patient fails to improve, including a psychiatrist in their care may be necessary. A recent meta-analysis found that there was a two-fold increase in medication compliance over six months with the collaborative care approach compared to the patient following only with primary care, and enhanced functional outcomes were noted in these patients two to five years later [21].

Consequences of Depression in Pregnancy

Unidentified and untreated depression can lead to detrimental effects on the mother and child. Suicide is the most catastrophic effect of undertreated depression. In addition, depressed women are more likely to participate in unhealthy practices during pregnancy such as smoking and illicit substance abuse. These women have higher rates of poor nutrition, in part due to a lack of appetite, leading to poor weight gain during pregnancy and risking intrauterine growth retardation. Depressed women are less compliant with prenatal care and feel less invested in the care toward their pregnancy. Finally, women with depression have increased pain and discomfort during their pregnancies, reporting worse nausea, stomach pain, shortness of breath, gastrointestinal symptoms, heart pounding, and dizziness compared to non-depressed women [22]. Untreated maternal depression in pregnancy has been associated with poor pregnancy and birth outcomes such as, maternal preeclampsia, low birth weight, smaller head circumferences, increased risk of premature delivery, increased surgical delivery interventions, lower APGAR scores, and more admissions to the neonatal intensive care unit [6,23-25].

Research suggests that maternal depression leads to an alteration in the mother's neuroendocrine axis and uterine blood flow, which may contribute to the premature delivery, low birth weight, and preeclampsia [26,27]. Negative birth outcomes are most highly associated with depression symptoms in the second and third trimester [28]. Babies of mothers who suffered from depression during their pregnancy have elevated cortisol and catecholamine levels at birth [6]. These infants cry more often and are more difficult to console than babies born to non-depressed mothers [29]. Babies of women at high risk for depression are shown to have more irregular sleep patterns and longer amounts of time in bed before falling asleep [30]. If depression continues into the postpartum period, the risk of long-term effects on the child such as poor mother-infant attachment, delayed cognitive and linguistic skills, impaired emotional development, and behavioral issues exist [31-33]. Studies show these babies are fussier, vocalize their needs less, and make fewer positive facial expressions than infants of non-depressed mothers [34]. If the baby is exposed to a depressed maternal environment during the first four months, even if later the depressed mother receives treatment, the child's developmental delay and symptoms remain [31]. As these children grow, perhaps due to early exposure or the continued stressful home environment, they are more likely to have emotional instability and conduct disorders, attempt suicide, and require mental health services themselves [35,36].

Treatment of Depression During Pregnancy

There are few current medical standards for treatment of women with depression during pregnancy, in part because ethical constraints preclude randomized controlled trials using pharmacotherapy during gestation. Some women do not seek treatment, but for those who do, many physicians are unsure of how to balance maternal medication needs with risk of exposure to the growing fetus [37]. Because many pregnancies are unplanned and undetected for some time, all women of childbearing age should have their depression managed as if they are or

will become pregnant. The primary care provider should engage in preconception planning with all women of childbearing age who have or are at risk for depressive illness. Treatment planning with regard to the use of pharmacotherapy during conception and the first trimester is among the most important decision points for a woman and their physician. Women diagnosed with depression who have been asymptomatic for over a year may wish to attempt to reduce or discontinue their antidepressants a few months prior to conception and throughout the pregnancy [38]; however, one study found that 60% of women taking antidepressants at the time of their baby's conception had depressive symptoms over the course of the pregnancy [39]. Women should be closely monitored for relapse of depressive symptoms. Sixty-eight percent of women who discontinued their antidepressants during pregnancy experienced relapse symptoms, compared with 26% of women who continued their medication regimen [40]. If a woman's depression history contains multiple relapses or severe symptoms including suicide attempts and multiple inpatient psychiatric admissions, it is recommended that she remain on antidepressants for her own safety, regardless of pregnancy status [38].

Although research studies indicate that no major malformations are associated with antidepressant use during pregnancy, it has also not been proven that any specific antidepressant is completely safe. All psychotropic medications cross the placenta and enter the amniotic fluid [41]. General guidelines include some straightforward principles: 1) keep the medication regimen simple, 2) use monotherapy, and 3) avoid medication changes during the pregnancy. Use of multiple medications in sequence as well as medication augmentation strategies all increases the exposure of the fetus [6]. The woman's prior history to pharmacotherapy should be considered when choosing a medication [6]. Although many factors influence pharmacotherapy during pregnancy, drugs with fewer metabolites, drug-drug interactions, more protein binding (preventing placental passage), and lesser teratogenic risk if known, should be prioritized when possible [6].

Spontaneous Abortion

Research results are mixed when examining rates of antidepressant use and its relationship to spontaneous abortion, and may be confounded by the effect of the illness itself [42]. One study suggests that women taking antidepressants during pregnancy have a statistically significant higher rate of spontaneous abortion (3.9%) regardless of the type of antidepressant [42]. However, another study found that spontaneous abortion rates are elevated for exposure to several different antidepressant classes, but only exposure to bupropion is statistically significant [43].

Teratogenicity

The literature on antidepressant use is growing, particularly regarding the use of selective serotonin reuptake inhibitors (SSRIs) during pregnancy and possible risk of teratogenicity. Although the popular press raises a great deal of controversy regarding the safety of the SSRIS, research to date does not confirm major congenital malformations. Kulin and colleagues found there no increased risk of major congenital malformations with in utero exposure to SSRIs, particularly fluvoxamine, paroxetine, and sertraline [44]. An earlier study examining fluoxetine exposure in the first trimester found there was an increase in minor anomalies, such as syndactyly [45]. In 2005, GlaxoSmithKline published a report based on a claims database study of 815 infants that showed babies born to mothers who were taking paroxetine during their first trimester had a 1.5 to 2 fold increased risk of congenital heart defects, particularly atrial and ventricular septal defects [46]. Einarson and colleagues more recently demonstrated that the rate of cardiac defects for babies exposed to paroxetine in the first trimester and non-exposed infants was the same (0.7%, not statistically significant), and within the expected cardiac malformation risk range for all pregnancies [47]. At the time of writing this manuscript,

the use of paroxetine remains controversial. Most practitioners avoid its use during pregnancy except for those women who have demonstrated a preferential past positive response to this agent. When paroxetine is used, it is recommended to monitor the fetus with fetal echocardiography [6].

The National Birth Defects Prevention Study in 2007 found no significant relationship between SSRIs and congenital cardiovascular malformations; however, they did find an association between SSRIs (especially paroxetine during the first trimester) and infants with anencephaly, craniosynostosis, and omphalocele [48]. Conversely, the Slone Epidemiology Center Birth Defects Study published around the same time noted no increased risk of craniosynostosis, omphalocele, or heart defects with overall SSRI use by pregnant women [49]. This study did in fact, find some significant relationships between sertraline and omphalocele and between paroxetine and right ventricular outflow tract obstruction defects [49]. Although these findings indicated some increased risk of specific rare birth defects with specific drug exposure, the overall absolute risk of birth defects with the use of SSRIs is small; therefore these medications are considered to be relatively safe for use during pregnancy [48,49].

Neonatal Adaptation

Studies show that up to 30% of infants exposed to SSRIs in utero during the third trimester are likely to have symptoms of poor neonatal adaptation [50]. These symptoms include short term self-limited jitteriness, tachycardia, hypothermia, vomiting, hypoglycemia, irritability, inconsolable crying, abnormal muscle tone, eating difficulties, sleep disturbances, seizures, and respiratory distress [50], which leads to an overall increased rate of neonatal intensive care unit admissions for these newborns. Studies assessing neonatal outcomes and complications do not correct for commonly co-occurring risk factors including maternal smoking, use of alcohol, or other substances [11]. Ferreira and colleagues, correcting for these confounding variables, found no increased incidence of preterm labor or neonatal intensive care unit admission for babies exposed to SSRIs or venlafaxine in utero; however, some infants did exhibit neonatal adaptation syndrome symptoms [51].

In a 2006 a case-controlled study, infants exposed to SSRIs after 20 weeks gestation had a 1% increased risk of persistent pulmonary hypertension of the newborn [52]; more research is needed to confirm these findings. While some international literature suggests tapering of SSRIs to avoid the late gestation exposure, most practitioners in the US avoid this, as it predisposes women to a substantially heightened risk of late pregnancy and postpartum morbidity secondary to depression [53]. As with any decision regarding pharmacotherapy during pregnancy, a consideration toward tapering should be considered on an individual basis, considering the risks of maternal illness versus the risk of short-term neonatal withdrawal symptoms [11].

The bulk of the literature to date does not reveal increased risk of congenital malformations associated with pregnant women taking tricyclic antidepressants (TCAs) [54], which historically were the medications of choice for the treatment of depression, but currently not extensively used. Doses of TCAs may need to be increased as much as 1.6 times the pre-pregnancy dose in the second half of pregnancy to establish therapeutic levels as a result of increased plasma volumes and metabolism [55]. Case reports have presented babies with TCA exposure experiencing temporary withdrawal symptoms within the first 12 hours of life including jitteriness, irritability, urinary retention, bowel obstruction, and occasionally seizures [54,56]. Nulman and colleagues found that there were no associations between maternal use of TCAs or fluoxetine during pregnancy and long term effects on global IQ, language or behavioral development in preschool children [57]. Further research is needed to examine long-term outcomes for these children.

Limited information is available regarding exposure to atypical antidepressants such as bupropion, mirtazapine, trazodone, and venlafaxine in utero [54,58]. Like SSRIs and TCAs, venlafaxine has been implicated in cases of neonatal withdrawal [59].

Nonpharmacologic Treatments

Psychotherapy has also been studied in the treatment of depression and is empirically validated for the treatment of mood disorders [60]. For mild depression, providers commonly suggest interpersonal psychotherapy (IPT), and/or cognitive behavioral therapy (CBT), both having solid evidence-based outcomes data for the treatment of depression [61]. IPT is useful in addressing resolving conflicts and role transitions. In studies, it has shown to reduce depressive symptoms and improve social adjustment [60]. CBT helps these women correct negative thinking and associated behaviors [61]. Couples counseling may also be indicated in women with significant marital strain. Women seeking treatment for depression may also benefit from nutrition counseling and regular low impact exercise [11,62]. Many providers advise pregnant women who take herbal supplements for their depression to cease during the pregnancy, since limited safety data in pregnancy exists. Finally, studies have shown that it is safe and effective for pregnant women with severe depression to participate in electroconvulsive therapy if they and their provider see this as the best therapy option [63].

Postpartum Depression

Background, Prevalence and Clinical Features

Postpartum depression develops in approximately 10 to 20% of women who give birth [64], with higher percentages in adolescents, mothers of premature infants, and women living in urban areas [65,66]. Women with low income and limited partner support are also at a higher risk [67,68]. Postpartum depression is often undetected and commonly underdiagnosed [69]. Many women expect an adjustment period after having a baby, and therefore may not recognize that the symptoms of depression are out of the ordinary [69]. They may not want to admit they have a problem, they feel that they need to prove they are a “good mother”, or believe that seeking treatment will immediately result in removal of their child by Child Protective Services. Many women do not seek treatment due to the combination of demanding newborn care and the lack of energy and motivation that comes with the disease process [60]. Furthermore, after the six week postpartum visit, a new mother who received her prenatal care from an obstetrician may not have routine healthcare scheduled, and she may feel as if she has no where to seek help [69]. If postpartum depression is left untreated, the symptoms last an average of seven months but can extend into the second year after delivery [60,69]. Depression has a wide impact, influencing all members of the family, and can lead to marital distress, family conflict, loss of income, and in extreme cases it can result in placement of the child in care outside the home [70].

The DSM-IV defines postpartum depression by the same symptom criteria as depression prior to or during pregnancy, but specifies that it begins within the first four weeks after the baby is born [7]. Onset can occur anywhere between 24 hours after giving birth and several months later [69]. Many epidemiologic studies define postpartum depression as depressive symptom onset within three months postpartum, and others within the first year after delivery [71]. Depression symptoms are often accompanied by co-morbid anxiety, and quite commonly women will have numerous concerns about their efficacy as a mother, or are preoccupied with the health, feeding and sleeping behaviors of their infants. As in pregnancy, major depressive disorder with postpartum onset must have the requisite clinical symptoms present for at least two weeks [7].

Continuum of Affective Symptoms During Postpartum

Postpartum depression must be differentiated from the "baby blues" and postpartum psychosis. The "baby blues" is reported to occur in up to 70% of women after delivery [72]. These women feel sad, weepy, irritable, anxious, confused, increased sensitivity, fatigue, sleep disturbances, and appetite changes [7]. The symptoms usually peak around four days postpartum and abate by day 10 [69,70]. Although these symptoms may only last a few hours to days, women who experience the baby blues are at a higher risk for developing postpartum depression. In women who were diagnosed with postpartum depression six weeks after delivery, two-thirds had experienced baby blues symptoms [73]. The baby blues however, almost always resolve within two weeks.

Postpartum psychosis occurs less commonly, impacting 0.2% of women of childbearing age [74]. Women may experience hallucinations, delusions, unusual behavior, agitation, disorganized thought, and an inability to sleep for several nights [7,70]. Often the hallucinations and delusions center on the baby and immediate intervention is vital to protect the lives of the mother and her child [7]. Typically this disorder presents within two weeks postpartum or sooner [7]. Most often, postpartum psychosis is the result of affective psychosis, most commonly bipolar affective disorder [7]. Any woman who has had an episode of postpartum psychosis in a prior pregnancy should be carefully screened for bipolar disorder. Women with a prior episode of postpartum psychosis are at a high risk for a subsequent episode. Postpartum psychosis is considered a psychiatric emergency due to the potential for catastrophic suicide and/or infanticide [70].

Risk Factors and Epidemiology

Risk factors for postpartum depression should be identified before or during the pregnancy and discussed at length between patient and provider. Many women who develop postpartum depression have had antenatal symptoms of depression [75]. Once a woman experiences postpartum depression, she is at risk for depression relapses with or without additional pregnancies [76]. Research shows that women with previous episodes of postpartum depression have a 25% risk of recurrence [77]. Experts debate whether the rapid decline in reproductive hormone levels after delivery contributes to depression development. Bloch found that when a decline of estradriol and progesterone was simulated in non-pregnant women, 63% of the women with a history of postpartum depression experienced some changes in mood, whereas the women without a history of postpartum depression did not experience any emotional changes. Thus, women with a history of postpartum depression may be more sensitive to the systemic decrease in gonadal steroids post-delivery [78]. Other risk factors for postpartum depression include past depressive symptoms not related to pregnancy, a family history of depression, and factors which influence depression at any time point including poor social support, social conflict, and life stressors [79].

Identification and Screening of Postpartum Depression

Healthcare providers can have difficulty differentiating postpartum depression symptoms from the normative adjustment of a woman to a new infant. The physician should take into account the circumstances (e.g. extreme fatigue although the baby may be sleeping through the night) and the intensity of the symptoms [69]. Routine postpartum visits, and well infant pediatric visits present an ideal time for depression screening [80]. Otherwise, the physician can use a screening question such as, "Have you had depressed mood or decreased interest or pleasure in activities most of the day nearly every day for the past two weeks?" [7]. Affirmative responses should cue the provider to screen for other neurovegetative symptoms including appetite and sleep changes, hopelessness, and difficulty paying attention. Significant impairment in social or occupational functioning should prompt a psychiatric referral.

Suicidality or the risk of harm to the infant requires an assessment for inpatient hospitalization. Concomitant illicit substance abuse likewise merits a prompt evaluation. If EPDS scores are lower than 10 on clinical assessment, but the patient still has some depressive symptoms, a reevaluation a few weeks later is recommended [70]. Other disease processes can mimic depression or can occur concomitantly. Patients presenting with symptoms of postpartum depression should routinely be tested for anemia and thyroid function, especially since hypothyroidism and hyperthyroidism occur more frequently postpartum and can lead to alterations in mood [70].

Treatment of Postpartum Depression

Antidepressant medication and psychotherapy are the foundation of treatment for postpartum depression. SSRIs are most commonly prescribed medications, but other agents should be considered with a patient's prior positive treatment response. Due to the high risk of recurrence in women with a previous history of postpartum depression, one study suggests providing prophylactic sertraline to prevent onset of symptoms [77]. Some literature suggests that women with postpartum depression may be likely to have a more positive response to serotonergic agents, such as SSRIs and venlafaxine, than to tricyclic antidepressants [81,82]. The antidepressant dose may be started at one-half the recommended amount and slowly increased; postpartum women appear to be more sensitive to the side effects of these medications. Increased anxious symptoms at initiation of medications is a common concern [83]. Once a steady, effective dose is reached, then pharmacotherapy should continue for at least six months to prevent a relapse of symptoms [7]. If there is no improvement with antidepressants after six weeks of therapy, a psychiatric consultation is appropriate [70].

Many women are hesitant to take antidepressants while breastfeeding their child. All antidepressants are secreted some degree into the breastmilk; however, ethical concerns prevent large randomized control trials in lactating mothers to determine efficacy and safety [38]. Of the SSRIs, sertraline and paroxetine have been studied and show minimal transfer of medication through the milk [84]. Fluoxetine has higher rates of secretion into breast milk. Because fluoxetine and its metabolite, norfluoxetine, have extremely long half-lives, they can accumulate in the infant's blood, reaching detectable levels [85]. Case reports link maternal fluoxetine use to colic, prolonged crying, and vomiting, so it is not considered the first-line SSRI for breastfeeding women [86]. If the mother has a positive history responding to fluoxetine, the benefit outweighs the risk and it should be continued while monitoring the child for side effects.

A substantial majority of lactating infants have no sequelae despite exposure to SSRIs during lactation. Mothers taking any antidepressant should be mindful of their infant's temperament and behavior, especially premature and sick newborns who may be predisposed to dehydration [70], and should notify their physician if they notice irritability, difficulty feeding, or disturbed sleep patterns [38]. In general, no adverse effects are noted in infants when breastfeeding mothers take tricyclic antidepressants [87]. Breastfeeding while taking doxepin has been reported to cause severe muscle hypotonia, vomiting, drowsiness, and jaundice in the baby, and, therefore, is not recommended [88]. Small case reports of atypical antidepressants have found no negative effects on the infant with maternal use of mirtazapine or trazodone [89, 90], an increased risk of drowsiness and lethargy with nefazodone (only one case) [91], and increased seizure risk with exposure to bupropion if the baby has a history of seizures [88, 92]. Larger studies are needed to explore these effects further. Research on long-term effects of SSRI and TCA exposure through breastmilk on children show no alteration in IQ, language development, or behavior [88].

For postpartum women with sleep difficulties, diphenhydramine may be helpful [93]. Lorazepam can be used in for women with profound sleep disruption; it has fewer active metabolites, reduces nighttime anxiety and enhances sleep. Lorazepam, however, is excreted into breastmilk in low concentrations [94,95]. Several studies have observed that in lactating mothers taking lorazepam, there are no adverse effects on the infant and no change in the amount of milk consumed. Caution should be taken when prescribing lorazepam during the infant's first few weeks of life because of the relative immaturity of the hepatic metabolism [94,95].

Interpersonal therapy is ideally suited to postpartum mothers, as almost all women have some concerns regarding role transitions that occur during this important life milestone. IPT effectively targets this transition. Likewise, CBT has shown to reduce depressive symptoms [96] by targeting inappropriate expectations that some women may have, such as the need to be a “perfect mother”, or a sense of shame by not being overjoyed with their infant during the immediate postpartum period. Both psychotherapies may be provided in 8 to 12 week periods [60]. Pilot studies are currently exploring the efficacy of the treatment provided over the phone, to allow women to receive the treatment without leaving their home [97]. Many women, especially those who have lactation concerns with pharmacotherapy, may be more comfortable beginning with IPT or CBT [60]. Additionally, behavioral strategies such as adjusting the sleep schedule (having each member of the marital dyad share some of the night-time responsibilities) and using the support of other family members to assist with nighttime feedings may enhance a woman's ability sleep at night [98].

Debate exists over the prospect of hormone therapy for postpartum depression. One study evaluated the effects of transdermal-17β-estradiol versus placebo and found a significant decrease in depression scores in the estradiol group [99]. One-half of the women receiving estradiol however, were also taking antidepressants, so the effect of hormone therapy alone is unclear. Additionally, the hypercoagulable state of postpartum women may limit the clinical utility of estrogen treatments. Prophylactic progesterone (norethisterone enanthate) postpartum compared to placebo demonstrated an increased risk of depressive symptoms in the treatment group [100]. More research is needed to explore hormonal treatment possibilities further.

Conclusion

Primary care providers need to be aware that depression in women during their childbearing years is extremely common. Routine depression screening, particularly at prenatal care visits, coupled with the use of physician collaborators to assist in connecting women with care is paramount. During prenatal interviews, providers should be aware of risk factors for depression, including previous history of depression and interpersonal conflict. Links have been made between depression during pregnancy and poor pregnancy outcomes such as preeclampsia, insufficient weight gain, decreased compliance with prenatal care, and premature labor. The literature suggests that overall the risks of SSRIs are small during pregnancy relative to the risk of undertreatment of depression. If depression continues postpartum, there is an increased risk of poor mother-infant attachment, delayed cognitive and linguistic skills, impaired emotional development, and behavioral issues. Longer term, these children are more likely to have emotional instability, conduct disorders, and require mental health services. To prevent these outcomes, postpartum depression screening with the EPDS or simple screening questions should be a priority for postpartum follow-up visits. Antidepressant treatments, interpersonal therapy, and adjunctive behavioral treatment, as well as involving family in the supportive care of the postpartum woman, are often helpful strategies. More research is needed to determine the long-term and developmental effects of antidepressant exposure in children occurring during pregnancy and lactation.

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