Abstract: Postpartum depression (PPD) is a cross-cultural form of major depressive disorder that affects some 13% of women and can have serious health consequences for both the mother and her child. Easy-to-use, reliable, self-administered screening tools are available. PPD may have a variety of etiologies, which include changing plasma levels of estrogen and progesterone, postpartum hypothyroidism, sleep deprivation, or difficult life circumstances. Standard treatments for PPD include psychotherapy and antidepressants. However, treatment of a thyroid condition or insomnia, or even regular exercise or massage may also be beneficial. PPD is underdiagnosed, therefore more screening is needed. Obstetricians and pediatricians have a unique opportunity to test women for PPD, but general practitioners may encounter patients with undiagnosed PPD, too. These physicians could positively impact the lives of depressed mothers and their children by identifying them, then treating or providing referrals for care as appropriate.

Key Words: diagnosis of postpartum depression, etiology of postpartum depression, treatment of postpartum depression

PPD is a serious medical matter not only because of the suffering it causes women, but because it can negatively affect infants emotionally, socially, and even cognitively, sometimes far beyond the time of the depression. The most severe adverse outcomes of PPD include increased risk of marital disruption and divorce, child abuse and neglect, and even maternal suicide or infanticide. Children of depressed mothers may experience insecurity, low self-esteem, and even decreased intellectual skills or language development.

Diagnosis

PPD is diagnosed according to the criteria laid out in the Diagnostic and Statistical Manual IV for MDD. At least five of the nine possible symptoms must be present for a minimum of two weeks. In addition, one of the symptoms present must be either sadness or loss of pleasure. The other possible manifestations include irrational guilt or feelings of worthlessness, low energy, difficulty concentrating, suicidal thoughts, psychomotor retardation or agitation, changes in sleep patterns, and changes in appetite. However, sleep disturbances and changes in appetite are a normal part of the postpartum period, even for women who are not depressed. Further, Bernstein et al found that women with PPD had less sad mood and less suicidal tendencies than non-postpartum women with MDD, as well as less psychomotor agitation or...
restlessness and more impaired concentration/trouble making decisions than depressed non-postpartum women. These differences suggest a need for a screening tool that is specifically geared toward detecting PPD.

The most common PPD screen in use today is the Edinburgh Postnatal Depression Scale (EPDS). It is a self-administered, multiple-choice test with ten questions, each of which has four possible answers, ranked 0–3, for a scoring range of 0–30. The authors recommend that ≥13 be considered a positive screen for PPD for a demonstrated sensitivity of 86% and specificity of 78%. Sit and Wisner (2009) reported that 93.4% of patients rated the EPDS “easy or fairly easy” to complete. The EPDS is ideal for busy obstetricians’ practices where practitioners may not have extensive experience with psychiatric tests or time to give each postpartum patient a thorough psychological exam.

Three of the ten questions of the EPDS deal specifically with anxiety, which is typically a more prominent feature of PPD than of non-postpartum MDD. Kabir (2008) posed the three EPDS anxiety questions (EPDS-3) to 199 mothers, then adjusted the raw score to compare to the 10-question EPDS. For that sample, an adjusted score ≥10 on the EPDS-3 had a sensitivity of 95% and a specificity of 80% for detecting PPD. Follow up with a diagnostic psychiatric interview was necessary. The authors concluded that the EPDS-3 appears to be a good alternative to the EPDS when the aim is to detect, rather than to assess the severity of PPD.

There is now also an Edinburgh Postnatal Depression Scale-Partner (EPDS-P) screen in which a new mother’s significant other rates her depressive symptoms, rather than the new mother herself. Recent data has shown that the EPDS-P rating is a better predictor of a new mother’s PPD than even the EPDS itself. Of course, it is only useful if the new mother’s partner is willing to accompany her to visit her physician or therapist and participate in her evaluation.

Other useful screening tools include the 9-question Patient Health Questionnaire (PHQ-9) with both a sensitivity and specificity of 88%, and the Postpartum Depression Screening Scale (PDSS). Women who screen positive for PPD during the initial phase of the 7-item PDSS then answer 28 additional questions. However, its low specificity leads to high rates of false-positive screens, which limits its usefulness.

Etiology

Women are about twice as likely as men to experience MDD in general. It is thought that about one-third of this risk for females is genetic, and the other two-thirds environmental. Men, however, do not experience PPD at all. Therefore, this particular type of MDD most likely has an underlying etiology that is at least in large part physiological, rather than merely psychosocial or circumstantial. Although PPD’s origins are not completely understood, various theories have been proposed. PPD may, in fact, have several possible underlying causes, which are outlined below.

Placental Steroids

Upon delivery of the placenta at birth, maternal plasma estrogen and progesterone levels begin to fall rapidly. Since these hormones have known neural effects at physiological concentrations, it has long been thought that their changing levels have psychological effects as well.

In mice, the brain’s GABA_A receptors, whose stimulation promotes relaxation and tranquility, are down-regulated during pregnancy by neurosteroids derived from progesterone. These receptors then rapidly rebound in the postpartum period. Interestingly, mice with defective GABA_A receptors have a significantly higher rate of depressive postpartum symptoms such as anhedonia. The mice with defective receptors are also more likely to neglect their pups, or even cannibalize them. The authors suggested that treatment with a particular GABA_A receptor agonist could be very effective.

Dennis (2008) reviewed two trials in which women were given either synthetic progesterin or transdermal estrogen in a single dose at 48 hours postpartum, and then screened for PPD using the EPDS at four or six weeks and again at twelve weeks postpartum. The progestin group was associated with increased symptoms of negative mood at six weeks postpartum, but not at twelve weeks, as compared to placebo. The estrogen group had fewer depressive symptoms than women in the placebo group at both four and twelve weeks postpartum. Taken as a whole, the current body of research on the relation between placental steroids and PPD seems to support an etiology for PPD that is at least in part related to changing estrogen and/or progesterone concentrations after birth.

Autoimmune Disorders

Physiological conditions with known etiologies that tend to flare up after childbirth are exclusively autoimmune in nature. One contributor to this flare up is the mother’s exposure to a variety of fetal antigens during delivery. MDD is characterized by such a postpartum flare and, therefore, at least some cases of PPD may also be autoimmune in nature.

For example, postpartum thyroiditis is a condition in which certain thyroid autoantibodies become detectable in plasma between six weeks and six months after pregnancy. It affects 6–9% of postpartum women who have no history of thyroid disease. In a quarter of the cases, this disorder presents with a hyperthyroid phase followed by a hypothyroid phase, but presentation with only hyperthyroidism or only hypothyroidism is also common. A few studies have attempted to determine whether any coincident depression is linked to the thyroid disease itself. No firm conclusions have yet been reached, but given that hypothyroidism’s symptoms include depression, some PPD may be thyroid-based.
Sleep and Circadian Rhythm Disturbances

At least five studies since 1968 have suggested that sleep disturbance may sometimes be a cause, rather than an effect of PPD. New moms cannot always sleep when they need to, because they have to care for their infants. Therefore, any tendency these women have to depression may be exacerbated by fatigue. In contrast, non-postpartum MDD may actually cause—rather than be caused by—insomnia. In short, MDD sometimes causes insomnia, but insomnia likely contributes to PPD.

Melatonin is a sleep hormone produced in the brain’s pineal gland. Its plasma concentrations begin to rise around bedtime and peak at about 3:00 AM, then fall to nearly undetectable levels by the time of rising. Exposure to light, especially blue light with a wavelength of about 470 nm, inhibits melatonin release. Bennet et al recently reported a small trial in which subjects with PPD who wore blue-blocking glasses when arising at night to take care of their newborns recovered significantly faster than controls who had PPD but did not wear the glasses. The implication is that disruption of normal melatonin production during the night may be a contributor to PPD.

Psychosocial Risk Factors

PPD has various psychosocial risk factors, some of which could be at least partially causative. These risk factors include MDD during pregnancy, anxiety during pregnancy, history of MDD, premenstrual dysphoric disorder, undue life stress during the prenatal period, lack of social support, marital difficulties, poverty, and young maternal age.

Treatment

Because universal screening is not yet the norm, many cases of PPD go undetected. Fortunately, PPD usually resolves without treatment within a few months, but long-term suffering is also possible. Given the potential harmful effects of PPD to both mother and child, treatment is usually desired.

Psychological/Psychosocial Intervention

Interpersonal psychotherapy (IPT) has been shown to be an effective intervention for the treatment of PPD. Cuijpers (2008) conducted a meta-analysis of 17 studies of psychological treatments for PPD. These psychological treatments ranged from cognitive-behavioral therapy to social support intervention and IPT. The 17 studies included a total of 1,248 participants—700 who received psychological treatment, 460 controls, and 88 who received treatment other than psychological. Results showed that, at least over the short term, women who received psychological intervention had significantly lower scores on their depression tests than controls. Not enough data were present to properly compare psychological treatments with pharmacological ones.

Dennis (2007) did a meta-analysis of nine trials covering 956 women in which either psychosocial or psychological intervention was made for PPD. Both of the treatments were effective in significantly reducing depressive symptoms. Although long-term effectiveness was not clear, counseling appeared to help women suffering from PPD.

In short, various studies have reported that women receiving IPT have reduced depressive symptoms over time compared to their wait-listed or control counterparts. Because there is some risk of side effects to nursing infants of mothers who are taking antidepressants, IPT is a logical first line of treatment for depressed, breastfeeding women. Another type of therapy which may also be effective for mild cases of PPD is an abbreviated form of IPT known as Interpersonal Counseling (IPC).

Antidepressants

Antidepressant medications have been shown to significantly reduce depressive symptoms in women with PPD. Although there is a range of antidepressants and anxiolytics available for the non-breastfeeding new mother with PPD, the well-known selective serotonin re-uptake inhibitor (SSRI) sertraline is the drug of choice for lactating women. Sertraline is considered relatively safe, because few adverse effects have been seen in the women’s infants. Other secondary options include paroxetine and nortriptyline. The greatest risk to nursing infants appears to be in the first eight weeks after birth. If breastfeeding can be timed so that it does not occur when concentrations of the antidepressant medication are at their peak in milk, risks to the infant are minimized. An excellent website for monitoring the current knowledge about medications and breastfeeding is <http://toxnet.nlm.nih.gov>; click on “LactMed.”

Managing Sleep Disturbance

Evidence suggests that inhibition of melatonin by exposure to light during the night may contribute to PPD. Simple actions such as using blue-blocking light bulbs or glasses at night or even learning to care for a newborn during the night in very low light overall might prove effective as a treatment for mood dysphoria.

Exercise

Aerobic exercise may be another efficacious treatment option for PPD. Two studies in Australia found that exercise for women with PPD was associated with improvement of depressive symptoms. Uncontrolled and observational studies have also suggested that PPD may be helped by exercise such as “pram walking.”

Exercise may improve PPD symptoms by increasing concentrations of endorphins, which are associated with feelings of well-being. Alternatively, being physically fit may increase self-esteem or provide a sense of achievement due to weight.
loss and improved muscle tone. Exercise may even merely be a beneficial distraction. In any case, given its low cost and low risk, moderate exercise may be attractive to women who might not opt for expensive counseling or a prescription medication.

**Massage**

Another non-pharmacologic intervention for PPD that has reportedly resulted in significant improvement is massage therapy for either the mother, or for the infant as administered by the mother. Dimidjian et al. reported that when a woman’s partner provided 20 minutes of massage to her twice a week for 16 weeks, depression and anxiety symptoms significantly decreased over controls, and infant outcomes improved. Although results for infant massage were less clear, five weekly sessions of infant massage by the mother, as taught in an infant massage class, were associated with greater self-reported improvements over controls.

**Treatment of Postpartum Thyroid Conditions**

Postpartum thyroid dysfunction may contribute to some PPD. In such cases, PPD might be corrected or at least improved by treating the thyroid disorder, without the need for psychotherapy and/or antidepressants.

**Recommendations**

Fewer than half the cases of PPD are diagnosed. Universal screening may be the ideal way to detect every woman who suffers from this unfortunate condition, although a firm recommendation for such screening has not been made by the American College of Obstetricians and Gynecologists.

One of the most obvious opportunities for detection of PPD is the 4–6 week postpartum obstetrics visit. Beyond postpartum screening, however, is the relatively new concept of prenatal screening for PPD. Kim et al. recently reported that giving women the EPDS at 24–28 weeks gestation resulted in a risk status that was identical with risk status after delivery for 90% of patients studied. The author concluded that such prenatal screening seemed clinically useful.

Other occasions for detection of PPD include well-child visits to the pediatrician. Understandably, a key issue is the lack of time during a routine visit to diagnose PPD and provide adequate education and guidance. Further, particularly in the pediatrician’s office, a physician may not want to be placed in the position of giving medical advice to an adult who is not the actual patient. However, two recent studies have shown that such screenings in pediatricians’ offices can be practicable and have good results. Chaudron reported detection of depressive symptoms in postpartum mothers by pediatricians increased with formal screening from a mere 1.6% to 8.5%, while Heneghan noted an improvement of detection in a high risk inner-city population from 29% to 40%. Given these encouraging preliminary findings, the small amount of time required to administer a self-scoring screening tool and provide some referral information might be well worth the potential for improving the lives of mothers and children.

General practitioners (GPs) may also encounter the occasional new mother who presents for treatment of some other coincidental ailment. This could be particularly important for the woman whose PPD onset occurs after her postpartum obstetric appointment, when she may have no further contact with her gynecologist for an extended period of time. Given PPD’s incidence and the number of undiagnosed cases, the GP who is willing to screen will likely detect new cases. It is helpful for screening physicians to have strong working relationships with mental health providers with whom a patient can follow up.

**Conclusion**

The postpartum period is a stressful time of transition, both physically and psychologically. PPD makes this phase of life especially burdensome and difficult for some women. Primary care physicians who are aware of this issue, who reach out with compassion and help, are in a unique position to lessen the pain of both mothers and their babies.

**References**


