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Onset or Exacerbation of OCD During Pregnancy: Clinical Characteristics and Etiological Considerations

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Although there are a large number of studies on postpartum illnesses, such as depression and psychosis, only recently have perinatal anxiety disorders received attention. A number of studies indicate that there can be a rapid onset or exacerbation of Obsessive-Compulsive Disorder (OCD) during pregnancy. This article reviews the extant research on pregnancy-related OCD. Due to their small samples and the retrospective nature of most of the studies, the prevalence and course of pregnancy-related OCD remains unclear. However, research in this area has demonstrated that in contrast to the heterogeneous symptomatology generally observed in OCD, the clinical characteristics of obsessions and compulsions in pregnancy are relatively homogeneous, with fear of contamination and compulsive cleaning the predominant features. The article discusses biological and psychosocial factors as possible causes of OCD, as well as potential directions for future study. Given its potential negative implications for mothers' postnatal mental health and infants' development, OCD during pregnancy deserves further attention.

Historically, pregnancy has been regarded as a period of emotional well-being, which protects the mother from psychological distress. However, it is now acknowledged that the perinatal period can be a time of increased vulnerability for the onset of mental disorders. In addition, pregnancy and the postpartum are considered to be high-risk periods for women with preexisting psychiatric illnesses. Although there are a large number of studies on postpartum depression and puerperal psychosis, the literature on perinatal anxiety disorders has only developed recently. Within this literature, research on Obsessive-Compulsive Disorder (OCD) has focused mainly on the postpartum period (for a review, see Abramowitz, Schwartz, Moore & Luenzmann, 2003), with pregnancy-related OCD remaining largely understudied, despite preliminary findings indicating development or exacerbation of OCD symptoms during that period.

Obsessive Compulsive Disorder is an anxiety disorder characterized by (a) recurrent, excessive, and intrusive thoughts that cause significant distress, and/or (b) compulsive behaviors or mental acts that are performed to neutralize or suppress these thoughts (American Psychiatric Association [DSM-IV-TR], 2000). Patients with OCD are also characterized as having some insight into their symptoms, recognizing that these thoughts are excessive, unreasonable, and maladaptive. A common element of the disorder is avoidance of situations related to the obsessional concerns (DSM-IV-TR, 2000).

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Obsessive Compulsive Disorder is one of the most common psychiatric disorders with a lifetime prevalence of 2-3% in the general adult population (Karno, Golding, Sorenson, & Burnam, 1988; Ruscio, Stein, Chiu, & Kessler, 2008). Data from the Epidemiologic Catchment Area program (ECA) show a 12-month prevalence of 1.2-2.4% (Fullana et al., 2009; Karno et al., 1988). The male to female ratio is approximately equal, but men have an earlier age of OCD onset (Nestadt, Bienvenu, Cai, Samuels, & Eaton, 1998). In women, the age of onset has a bimodal distribution (the first peak between 13-16 years of age, and the second between 22-32 years of age); though some evidence has found OCD onset in later life (Nestadt et al., 1998; Neziroglu, Anemone, & Yaryura-Tobias, 1992). The clinical picture of OCD is strikingly heterogeneous: obsessional thoughts may be fear of contamination, excessive doubting, symmetry, aggression, as well as sexual and religious obsessions, whereas compulsive behaviors may include cleaning, checking, counting, praying, and repeating words silently. These symptoms have been meta-analytically clustered into four symptom dimensions: 1) symmetry obsessions and ordering compulsions, 2) aggressive obsessions and checking compulsions, 3) contamination obsessions and cleaning compulsions, and 4) hoarding obsessions and compulsions (Bloch, Landeros-Weisenberger, Rosario, Pittenger, & Leckman, 2008). The prognosis of OCD is mixed, but if it is not effectively treated, it usually has a deteriorating and chronic course (Abramowitz et al., 2003).

Prevalence of Pregnancy-Onset OCD

The exact prevalence of OCD during pregnancy is unknown, but there is evidence that pregnant women have a

greater likelihood of manifesting OCD symptoms compared to the general population. Several early studies report an association between OCD symptoms and significant life events, including pregnancy and childbirth. In a study of 150 OCD patients, Pollitt (1957) found that 62% (n = 93) reportedly linked the onset of their symptoms with a specific life event with three patients reporting the development of OCD symptoms during pregnancy, and seven after childbirth. Ingram (1961) found that out of 89 OCD patients, 69% (n = 61) developed OCD within a year of a significant life event. Moreover, of those 61 patients, 15 (25%) associated the onset of symptoms with pregnancy, the strongest precipitating correlate of obsessive symptoms. In contrast, Lo (1967) found that of 56 patients only 5% reported that pregnancy triggered OCD. This conflicting evidence is likely due in part to the several limitations of the above cited studies: they were retrospective, did not differentiate based on gender, and used vague diagnostic criteria of OCD, such as "obsessional states/patients" (Pollitt, 1957, p. 194).

In a more recent study of 60 patients (39 females and 21 males) diagnosed with OCD as defined by the Diagnostic and Statistical Manual of Mental Disorders, Third Edition – Revised (DSM-III-R), six women first manifested OCD during their pregnancy (Buttolph & Holland, 1990). Neziroglu and colleagues (1992) similarly found that of 59 mothers who met criteria for OCD according to DSM-III, 23 (39%) linked pregnancy with the onset of OCD. Based on these findings, the authors hypothesized that pregnancy is indeed an important life event that may precipitate OCD. Additional evidence supports the association between OCD onset and pregnancy. For example, Williams & Koran (1997) document that the onset of OCD was associated with pregnancy in 5 (13%) of the 38 study participants, while a controlled study of Nigerian women, Adewuya, Ola, Aloba, and Mapayi (2006) found that pregnant women were three times more likely to have OCD.

In contrast, a study of 136 Italian participants conducted by Maina, Albert, Bogetto, Vaschetto, and Ravizza (1999) did not find a significant association between pregnancy and OCD onset, with only two out of 35 women (0.05%) reporting first-onset OCD during pregnancy. The authors however suggested that these findings deserve critical consideration as the low rates of first-onset OCD in this sample compared to other studies might be attributable to the exclusion of co-morbid depression, suggesting that pregnancy may be a risk factor for the development of OCD particularly for those with concomitant depression. In one recent prospective study assessing women before and after childbirth, Uguz and colleagues (2007a) found that three of 16 participants (18.8%) experienced OCD symptoms for the first time during pregnancy. While the sample size is small, the strength of this study lies in its prospective methodology. In a larger subsequent study with 434 women, the same authors reported that 3.5% (n = 15) of participants developed OCD as defined by the Structured Clinical Interview for DSM-IV Axis I Disorders [*SCID-I*] in the third trimester of pregnancy (Uguz et al., 2007b).

Exacerbation of OCD During Pregnancy

Besides OCD with perinatal onset, there is evidence supporting the exacerbation of OCD symptoms during pregnancy. Buttolph and Holland (1990) reported exacerbation of OCD symptoms in 8% of the 39 female patients. In a case study, Chelmow and Halfin (1997) reported exacerbated OCD symptoms in a 28-year-old pregnant woman with previously diagnosed OCD following her first pregnancy. Other studies show a bidirectional change in symptom severity during pregnancy. Williams and Koran (1997) found that of 29 pregnant patients with preexisting OCD, five (17%) reported worsening, four (14%) described improvement, and 20 (69%) described no change in symptoms during pregnancy. Vulink, Denys, Bus, and Westenberg (2006) assessed symptom severity using the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) symptom checklist in 52 women meeting criteria for OCD according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). Pregnancy was associated with a worsening of OCD symptoms in 33% of patients (severe worsening for 23% of them), and a moderate improvement in 21% of patients. Uguz and colleagues (2007b) reported worsening of preexisting OCD in six patients (46.1%), compared with amelioration of symptoms in three patients (23.1%); four patients (30.8%) reported no change in OCD symptoms during pregnancy.

Overall, these findings suggest that pregnancy may be associated with the onset of OCD, or exacerbation of the ongoing disorder in pregnant women. However, due to the retrospective design of the majority of the studies, no causal relationships can be inferred. Also, discrepancies in the data reported above could be due to small sample sizes, methodological variability, and the lack of standardized diagnostic criteria for OCD.

Clinical Characteristics of Pregnancy-Related OCD

Contrary to the varied symptom pattern in typical OCD, pregnancy-related OCD tends to be remarkably homogeneous. Findings from case studies with pregnant OCD patients reveal a relatively consistent content of obsessions and compulsions. Buttolph and Holland (1990) described two women with onset of OCD during pregnancy. The women's OCD was characterized by compulsive washing rituals and obsessions involving fear of the fetus becoming contaminated by toxic agents. In another case study of pregnancy-induced OCD, Kalra, Tandon, Trivedi, and Janca (2005) described a patient who had fears of contamination; while she recognized her thoughts as irrational, she continued to engage in compulsive washing rituals. Similarly, in a case of pregnancy-complicated OCD, Chelmow and Halfin (1997)

presented a patient who experienced a fear of blood-borne disease and engaged in compulsive cleaning and organizing of household items.

More recent studies have used the Y-BOCS symptom checklist to assess the severity and type of OCD symptoms. In the study by Uguz and colleagues (2007b), the most common obsessions among pregnant women with OCD were fear of contamination (80%) and preoccupation with symmetry/exactness (60%), while the most common compulsions were cleaning/washing (86.7%) and checking (60%). The authors found similar results in their prospective study of 16 women (Uguz et al., 2007a), noting that the most common obsessions reported by women in the 38th gestational week were fear of contamination (81.3%), preoccupation with symmetry/exactness (50%), aggressive (43.3%), and religious obsessions (37.5%), whereas the most common compulsions were cleaning/washing (81.3%), checking (56.3%), and ordering/arranging (43.8%). In a more recent study, Labad and colleagues (2010) interviewed 90 female outpatients with OCD. The authors found that patients who predominantly had obsessions about contamination and compulsions about cleaning had greater chance of developing these symptoms during the perinatal period. Conversely, patients in the hoarding dimension mostly reported onset of OCD at menarche.

Course and Comorbidity of Pregnancy-Related OCD

Though the course of pregnancy-related OCD has received little empirical attention, there is some evidence that OCD symptoms improve during the postpartum period. In their prospective study of 16 OCD patients, Uguz and colleagues (2007a) found that 11 patients (69%) reported a decrease in OCD symptoms at six weeks after birth. Kalra and colleagues (2005) presented a case of a 30-year-old primigravid woman with onset of OCD in the fourth month of gestation who fully recovered two weeks after delivery without psychiatric intervention. In contrast, there is ample evidence that women with anxiety disorders during pregnancy are at higher risk of presenting depressive symptoms at early postpartum, even after controlling for antenatal depression (Heron, O'Connor, Evans, Golding, & Glover, 2004; Milgrom et al., 2008; Moss, Skouteris, Wertheim, Paxton, & Milgrom, 2009; Sutter-Dallay, Giaconne-Marcesche, Glatigny-Dallay, & Verdoux, 2004). Therefore, while pure OCD symptoms might improve postpartum, it is possible that pregnancy-related OCD is a precipitating factor for postnatal depression. However, no definitive conclusions can be drawn since, to date, there has been no prospective study exploring the relationship between postpartum depression and OCD specifically.

Results from epidemiological studies demonstrate that, in general, OCD patients manifest a number of additional psychiatric conditions, predominantly major depressive disorder (Hollander et al., 1997). In addition, research on the postpartum period shows a strong association between OCD symptoms and postpartum depression (Abramowitz, Schwartz, & Moore, 2003b; Wisner, Peindl, Gigliotti, & Hanusa, 1999; Zambaldi, Cantilino, Montenegro, Paes, de Albuquerque & Sougey, 2009). However, there are few studies exploring the comorbidity of OCD with depression during pregnancy; in the majority of studies on pregnancy-related OCD, concomitant depression has been regarded as an exclusion criterion rather than a focus for investigation.

Etiological Considerations

The etiology of OCD remains largely unknown. Several biological (genetic, neurochemical and anatomical) and psychosocial factors may contribute to the development of OCD in pregnancy.

Biological Factors

The well-established efficacy of serotonin reuptake inhibitors (SRIs), particularly clomipramine, in the treatment of OCD symptoms (Ackerman & Greenland, 2002) led to the development of the "serotonin hypothesis" (Barr et al., 1993). According to this neurochemical model, obsessive-compulsive symptoms are generated due to deficits in the serotonin neurotransmitter system. However, not all OCD patients respond positively to SRI monotherapy. Findings regarding the role of serotonin on OCD have been equivocal (Rauch & Jenike, 1993). During pregnancy there is a significant increase in sex hormones, mainly estrogen and progesterone, which is followed by an abrupt drop after parturition. There is evidence that fluctuations in gonadal steroid levels may alter serotonergic transmission, reuptake, and binding (Rubinow, Schmidt & Roca, 1998). Research has also shown that OCD symptoms begin or worsen during the premenstruum (Labad et al., 2005; Williams & Koran, 1997). Thus, it has been proposed that OCD during pregnancy or following childbirth may be the result of these two hormones' effects on serotonergic functioning (Sichel et al., 1993).

Investigation beyond the serotonergic system shows that neuropeptides may be involved in the pathogenesis of OCD. Of particular interest is oxytocin, a nonapaptide synthesized in the hypothalamus and released into the blood from the pituitary gland (Leckman et al., 1994a). Oxytocin has been implicated in the promotion of grooming behavior. It has been suggested that contamination obsessions and excessive cleaning rituals are analogous to oxytocin-induced behaviors of cleaning or maintaining another's body or appearance (allogrooming) commonly observed in social animals. In addition, oxytocin attenuates memory retrieval, which offers a plausible explanation to pathological doubting and checking compulsions in OCD (McDougal et al., 1999). Several findings suggest an association of OCD with oxytocin. In one well-known study (Leckman et al., 1994b), patients with OCD had significantly increased oxytocin levels in their cerebrospinal fluid (CSF). During late pregnancy and the postpartum

period, oxytocin concentration in the bloodstream increases, stimulating uterine contractions and milk ejection for lactation. Therefore, it is possible that OCD during pregnancy is oxytocin-induced. However, other studies have not reported the same correlation between OCD symptoms and oxytocin levels (Altemus et al., 1999).

While biological theory has proved intriguing, findings from genetic and family investigations have provided some support for a genetic basis for OCD. The concordance rate of OCD is higher for monozygotic twins than for dizygotic twins and genetic influence ranges from 27% to 47% (for a review, see van Grootheest et al., 2005). In addition, the prevalence of OCD is higher among first-degree relatives of affected probands than those of control probands, 12% and 3%, respectively (Nestadt et al., 2000). There is also evidence that a family history of OCD is associated with early onset of the disorder (Hanna, Himle, Curtis, & Gillespie, 2005). Genetic studies in OCD during pregnancy are scarce. To the author's knowledge, only one study has addressed this issue. Uguz and colleagues (2007b) found that pregnant women with OCD were significantly more likely to have a positive family history of OCD compared to pregnant women without OCD. However, family history of OCD was based on self-reports rather than structured, standardized diagnostic interviews.

Psychosocial Factors

While biological theories are largely successful at explaining the unique etiological factors of pregnancy-related OCD, a growing body of research suggests that there may also be psychosocial determinants of the disorder. One such finding is that the male partners of pregnant women appear to be susceptible to the development of OCD symptoms. Abramowitz and colleagues (2001) reported four cases of male spouses who experienced an onset of OCD during their wives' pregnancy or after delivery. All four fathers reported intrusive ego-dystonic thoughts of harming the child (e.g., intrusive ideas of stabbing the baby with sharp objects, shaking the baby to death, etc.), a finding that points out the inadequacy of purely biological theories to explain the onset of symptoms during this period. The high prevalence of obsessions among new fathers was further corroborated in a survey of 600 childbearing women and their partners (2003). Twenty-three (57.7%) out of 40 male respondents endorsed some intrusive obsessive thoughts, a rate similar to this of mothers (Abramowitz, Schwartz, & Moore, 2003).

Furthermore, it may be valuable to consider the interaction between biological vulnerability and environmental stressors in the development of OCD during pregnancy. Not all women associate their pregnancy with positive emotions, an oft-held notion. Some women experience pregnancy as a stressful life event (Geller, 2004). Among a growing body of literature investigating the role of Stressful Life Events (SLE) in the onset of depressive and anxiety disorders (Paykel & Dowlatshahi, 1988), evidence suggests that SLEs are associated with the onset of OCD (Cromer, Schmidt, & Murphy, 2007). Research has identified other risk factors for pregnancy-related OCD, such as mothers' younger age, first pregnancy, comorbid premenstrual dysphoric disorder (PMDD), prior history of abortion and miscarriage, obstetric complications and medical conditions, unplanned pregnancy, and having a poor relationship with one's own mother (Adewuya et al., 2006; Fontenelle & Haler, 2006; Labad et al., 2005; Neziroglu et al., 1992). Moreover, lack of social support with household responsibilities and childcare is associated with a poorer prognosis of the disorder (Uguz et al., 2007a) and greater likelihood of developing depression postnatally (Webster et al., 2000).

Drawing on D. W. Winnicott's (1956) notion of ''primary maternal preoccupations,'' contemporary researchers hypothesize that mothers may be genetically predisposed to demonstrate increased protectiveness and preoccupation with their infant's safety, thereby creating a safe environment that ensures the survival of the infant (e.g., Leckman et al., 2004). Obsessive-compulsive behavior could thus be conceptualized as an extension of an adaptive maternal behavior. Findings by Jennings and colleagues (1999) lend support to this, showing that as high as 6.5% of asymptomatic postpartum women experienced aggressive thoughts towards their infants. The Cognitive Appraisal Model (Salkovskis, 1999) supports the evolutionary perspective by theorizing that the majority of adults experience intrusive, upsetting, ego-dystonic thoughts, which are indistinguishable from clinical obsession in terms of content. Vulnerable individuals tend to "misappraise" these common and benign thoughts as threatening. For example, they falsely believe that thinking about a violent act is equivalent to committing such an act (morality bias), or that thinking about something increases the probability that it will actually occur (probability bias). It is when individuals misappraise these thoughts as threatening that clinical obsessions occur, further leading to attempts to prevent or neutralize the thoughts by engaging in ritualistic behaviors (Salkovskis & Harrison, 1984).

Clinical Implications and Recommendations

Obsessive Compulsive Disorder during pregnancy causes significant disturbance and has a negative impact on physical and psychological well-being, as well as social relationships (Gezginc et al., 2008). In addition, a significant body of research supports a link between prenatal anxiety and neonatal outcomes, such as preterm labor, heart defects, and growth retardation (see Talge, Neal, & Glover, 2007 for a review). Moreover, prenatal anxiety can have long-term deleterious effects on a child's cognitive, behavioral, and emotional functioning (Huizink, Mulder, & Buitelaar, 2004). Furthermore, in the absence of treatment, anxiety disorders are a strong precipitating factor in postpartum depression (Skouteris, Wertheim, Rallis, Milgrom, & Paxton, 2009), and thus, OCD may have

negative implications for the mother-infant relationship (Chelmow & Halfin, 1997). Research in the postpartum shows that depression may severely compromise a mother's ability to care for the infant and engage the infant in social interactions (Murray, Cooper, & Hipwell, 2003). Depressed mothers may talk less to their infants, manifest fewer facial expressions, show less physical affection, have impaired bonding, and negatively influence the affective regulation of their child (Moehler, Brunner, Parzer, Wiebel, Reck, & Resch, 2006; Tronick, & Reck, 2009). Maternal depression may also have adverse effects on infants' cognitive and emotional development (Murray & Cooper, 1996; Murray, Hipwell, Hooper, Stein, & Cooper, 1996). However, there is evidence indicating that the association between prenatal anxiety and child adjustment is not fully explained by the mediation of postnatal depression. For example, O'Connor and colleagues (2002) found a significant effect of antenatal anxiety on child behavioral and emotional problems after accounting for postnatal depression. Together these findings point to the importance of detection and treatment of OCD in pregnancy.

Clinical surveillance for OCD during pregnancy should be part of the screening process in obstetrical and primary care. Screening should first include simple questions regarding intrusive, unwanted thoughts (i.e., contamination) and compulsive behaviors (i.e., excessive washing and checking behaviors). Should the patient endorse such symptoms, the frequency and severity of the symptoms should be assessed using measures of OCD with well-established psychometric properties (e.g., YBOCS). In the event of clinically significant OCD symptoms, a referral for psychiatric consultation and/or treatment should be considered (Brandes, Soares, & Cohen, 2003). Several selective serotonin reuptake inhibitors have demonstrated efficacy and tolerability in the treatment of OCD, among them fluoxetine, sertraline, fluvoxamine, and paroxetine (see Pigott & Seay, 1999 for a review). However, antidepressant medication may not be a viable treatment option during pregnancy; despite their low side-effect rates, SSRIs have not been approved by the Food and Drug Administration (FDA) for use during pregnancy (Weisberg & Paquette, 2002).

Among non-pharmacologic treatments, cognitive-behavioral therapy (CBT) is the most widely tested psychosocial approach for OCD. Within the CBT paradigm, numerous different treatment models for OCD exist, such as exposure (imaginal or in-vivo), response prevention, cognitive therapy (CT), and rational-emotive therapy (RET). A number of randomized controlled trials (RCTs) attest to the efficacy of exposure in combination with response prevention (ERP) for treating OCD either in an individual or group format (Deacon & Abramowitz, 2004). However, there has been no research on the efficacy of CBT or other psychosocial intervention in the treatment of OCD in pregnancy.

Conclusion

Existing findings indicate that a sizeable proportion of women experience a sudden onset or exacerbation of OCD during pregnancy suggesting that pregnancy is a vulnerable period for the development or exacerbation of OCD. Several biological and psychosocial factors are implicated in the etiology of OCD in pregnancy, yet the exact mechanism of pathogenesis is unknown. Due to limited research and methodological shortcomings, future research is needed to further explore the prevalence, course, and etiology of the disorder.

Prospective studies are needed to further elucidate the prevalence and course of OCD during pregnancy and to identify at-risk subgroups. Longitudinal studies should commence prior to conception, if possible, and follow-up should be performed postpartum. Future studies need larger samples and assessment of OCD symptoms should be carried out at multiple points during gestation, ideally during each trimester. In addition, pregnant women with OCD should be compared with control groups of nonpregnant women matched for demographic and clinical variables such as age, marital status, socioeconomic status, family history of the disorder, and co-morbid mental disorders. Future studies should incorporate a number of additional parameters. Inclusion of patients with concurrent depression is needed in order to clarify the nature of the relationship between OCD and major depression. Studies would also benefit from the inclusion of subclinical obsessive-compulsive symptoms (Abramowitz et al., 2003a) because cut-off scores tend to simplify the clinical picture of the disorder. Finally, given the possible association between OCD symptoms and complications in pregnancy, future studies should record a detailed medical and gynecological history, including obstetric complications (e.g., pre-eclampsia), premenstrual symptoms, and number of previous pregnancies, miscarriages, and abortions.

A better understanding of the prevalence and pathogenesis of the disorder is vital as OCD in pregnancy is a debilitating condition that deserves attention in its own right. Additionally, pregnancy-related OCD is associated with postnatal depression and may have long-term negative effects on the infant's development. Thus, specific identification and treatment of pregnancy-related OCD is likely to have preventative benefit for the mother as well as the infant. Given its important clinical implications for both the mother and the infant, future research should adapt and test psychosocial treatments for OCD in pregnancy.

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