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The obsessive–compulsive spectrum in the perinatal period: a prospective pilot study

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Abstract

This study aims to describe the phenomenology of obsessive–compulsive symptoms (OCS) and disorders (OCD) in perinatal women and to explore the relationship of OCS/OCD to postpartum depression. A prospective longitudinal study of 44 women screened with the Obsessive–Compulsive Inventory—Revised (OCI-R) and Edinburgh Postnatal Depression Scale (EPDS) between 30 and 37 weeks of pregnancy. Twenty-four women completed a diagnostic interview and the Yale–Brown Obsessive–Compulsive Scale (Y-BOCS) before delivery and were contacted postpartum to repeat the EPDS and Y-BOCS. In the third trimester, 32% reported high levels of anxiety and/or depressive symptoms ($EPDS \geq 10$ and/or $OCI-R \geq 15$) and 29% of those who completed the diagnostic interview met criteria for OCD. At 1 month postpartum, 12.5% had new OCS ($Y-BOCS \geq 8$) and 25% had new high levels of depressive symptoms ($EPDS \geq 10$). OCS increased in intensity postpartum but did not change in character. OCD and OCS may be of greater prevalence during the perinatal period than previously recognized. The high rates provide new information and require replication in larger, more diverse populations. Research in the perinatal period must expand beyond the exploration of depression to include anxiety disorders and specifically OCD.

Keywords

Postpartum depression; Maternal depression; Anxiety disorders; Obsessive–compulsive disorder

Introduction

The relationship between the perinatal period and maternal mental health disorders has received national attention (Gaynes et al. 2005). Two primary focal areas include improving the detection of perinatal depression by standardized use of validated screening tools (Chaudron et al. 2007; Olson et al. 2005) and evaluating the safety of antidepressants during pregnancy (Yonkers et al. 2009) and breastfeeding (Weissman et al. 2004). Despite the co-morbidity of mood and anxiety disorders and the use of similar treatments (antidepressants and cognitive behavioral therapy), little attention has been given to the experience of maternal anxiety during the perinatal period. Recent studies have begun to demonstrate that maternal anxiety during

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pregnancy can negatively affect fetal outcomes as well as result in long-term behavioral disturbances for children (O'Connor et al. 2002, 2003). These studies shed light on the crucial need to understand and treat anxiety disorders during the perinatal period.

One anxiety disorder, obsessive-compulsive disorder (OCD), has been linked to postpartum depression through overlapping symptoms such as obsessional and intrusive thoughts (Wisner et al. 1999) as well as high rates of postpartum depressive symptoms in women with OCD (Williams and Koran 1997; Labad et al. 2005). Large epidemiological studies estimate the prevalence of OCD at 1–2.5% of the general population (Kessler et al. 1994, 2005) with sub-threshold OCD estimated to affect 6% of primary care patients (Olfson et al. 1996). Perinatal depression affects 14% of the general population (Gaynes et al. 2005), and in low-income and minority groups of women, the rates exceed 25% (Chaudron et al. 2004; Morris-Rush et al. 2003). The incidence, prevalence, and impact of OCD, as well as sub-threshold OCD or obsessive-compulsive symptoms (OCS), during the perinatal period are essentially unknown (Abramowitz et al. 2003). Furthermore, the relationship between perinatal OCD or OCS and perinatal depression is essentially unknown.

The etiology of perinatal OCS and OCD has not been established. Because of the heterogeneous nature of OCD, many experts believe that its etiology may be ascribed to a variety of etiologic processes and their interactions. These include genetic, environmental, immunological, and hormonal factors (Brandes et al. 2004). The dynamic nature of the hormonal environment of the perinatal woman has led to specific hypotheses regarding the effects of increased oxytocin in the postpartum period as well as the rapid shifts in estrogen and progesterone (Altemus 2001; Stein et al. 1993). Recent studies have begun to explore a link between OCS and increased oxytocin (Bartz and Hollander 2008). The increase in symptoms in the perinatal period may be related to this increased concentration. Another area of exploration has been on the rapid shifts in estrogen and progesterone and their potential impact on serotonergic transmission which has been hypothesized to influence OCD and OCS (Williams and Koran 1997). In addition to proposed biological processes, psychological stress of pregnancy and infant care may contribute to the development of OCS and even possibly OCD. Evolutionary, sociobiological, and cognitive vulnerability hypotheses have also been proposed (Abramowitz et al. 2003). Similarly, perinatal depression is hypothesized to be multifactorial and similar etiologic mechanisms are under investigation (Bloch et al. 2003).

Current data specific to OCD, sub-threshold OCD, and OCS in the perinatal period are limited by study design (i.e., majority are retrospective studies) or the sample population (majority are clinical populations of women who have OCD). One retrospective study found a prevalence of 2.7% for OCD and 5.4% for sub-syndromal OCD in postpartum women (Wenzel et al. 2005). A recent prospective study conducted in Turkey found a 3.5% third trimester prevalence and a 0.5% second trimester incidence of OCD in 434 women during pregnancy (Uguz et al. 2007b). Among the women with OCD, the most common obsessions were contamination and symmetry/exactness and the most common compulsions were cleaning and checking.

As described, there are a variety of mechanisms by which OCD and perinatal depression may overlap, co-exist, and/or interact. Based on the spectrum of possibilities, we hypothesize that there is a subset of women who are predisposed by pre-existing OCD, sub-threshold OCD, or OCS to develop postpartum depression. When these women are exposed to infant demands that require maternal adaptability and flexibility, they become increasingly anxious and, at times, depressed. To explore this hypothesis and describe a non-clinical sample of perinatal women, we conducted a prospective longitudinal study of pregnant women to describe the prevalence, incidence, types and severity of OCD/OCS, and co-morbid diagnoses during pregnancy and postpartum. We also examine, in a preliminary way, the associations between the OC spectrum and postpartum depression.

Method

The study was approved by the University of Rochester Research Subjects Review Board. All participants provided written informed consent.

Recruitment and sample

Subjects were recruited from a large academic medical center obstetric and gynecological clinic in Rochester, NY, USA. Eighty-two women who attended the clinic between September 2006 and May 2007 were 18 years or older and between 30 and 37 weeks of pregnancy, were identified as potential participants, and were invited to participate in the initial screen. Forty-four women (54%) agreed to participate and provided written informed consent. Nine refused (11%) but provided non-identifiable demographic information. The remainder were either ineligible due to age, language, week of pregnancy ($N=17$, 21%), or refused to provide any information ($N=12$, 15%; Fig. 1). Subjects initially completed two screening questionnaires—the Obsessive–Compulsive Inventory–Revised (OCI-R) and Edinburgh Postnatal Depression Scale (EPDS). Following screening, women were scheduled to complete a semi-structured clinical interview (Structured Clinical Interview for DSM-IV (SCID)), Yale–Brown Obsessive–Compulsive Scale (Y-BOCS), and an information packet regarding their reproductive, pregnancy, family, and medical and psychiatric health histories. Follow-up telephone interviews were conducted at 1, 3, and 6 months postpartum at which time the Y-BOCS and EPDS were repeated.

Measures

The Obsessive–Compulsive Inventory—Revised, an 18-item self-report questionnaire, is widely used in research with non-clinical samples (Foa et al. 2002). Respondents rate the level of distress, on a scale of 0–4, of 18 common OCD symptoms that they encountered in the past month. This tool has been validated against the SCID-IV and Y-BOCS. It has optimal cut-scores of 21 (sensitivity 65.6%, specificity 63.9%) when distinguishing subjects with OCD from non-anxious controls and 18 (sensitivity 74.0%, specificity 75.2%) when distinguishing subjects with OCD from anxious controls. We chose a lower cut-point, 15 (sensitivity 83.7%, specificity 66.9% when distinguishing subjects with OCD from anxious controls), as we are interested in a spectrum of OC symptoms. The OCI-R has not been validated during pregnancy or the postpartum period and therefore was used not to provide diagnoses of OCD but rather to help measure initial levels of OCS.

The Yale–Brown Obsessive–Compulsive Scale (Y-BOCS) is considered the gold standard for assessing OC symptoms and overall OCD severity (Goodman et al. 1989a,b). The Y-BOCS symptom checklist assesses a wide range of symptoms and can be used to assess severity and change in symptoms. The scale includes two subscales (obsessions and compulsions) that are scored separately and then a total score of the subscales is obtained. Symptom severity is grouped as follows: 0–7 sub-clinical, 8–15 mild, 16–23 moderate, 24–31 severe, and 32–40 extreme. It can be administered through a self-report and over the telephone. The Y-BOCS has not been validated during pregnancy or the postpartum period but has been used in multiple studies of perinatal women (Uguz et al. 2007a,b,c;Zambaldi et al. 2009).

The Edinburgh Postnatal Depression Scale is a 10-item self-administered questionnaire developed to assess depression in postpartum women (Cox et al. 1987). It is the most widely used screening tool for detection of high levels of depressive symptoms in pregnancy and postpartum and has been validated in a variety of samples. In pregnancy, the recommended cut-point is 13 or greater for English-speaking women (Matthey et al. 2006), but varies in other cultures (Su et al. 2007; Adouard et al. 2005). At 6–8 weeks postpartum, it has a sensitivity of between 67% and 100%, and a specificity of between 78% and 96% for a score ≥ 10 . We chose

a score of 10 or greater both in pregnancy and postpartum for two reasons. First, we are interested in capturing high levels of depressive symptoms not simply diagnostic levels of major depression. Secondly, many studies use a score of 10 or greater in the postpartum period, and to allow for comparisons of symptom levels before and after delivery, we chose to use 10 as the cut-point at all time points.

The Structured Clinical Interview for DSM-IV is a semi-structured interview developed to determine DSM Axis I diagnoses (Spitzer et al. 1992). It is reliable with most major categories having kappas of 0.6 or greater (Williams et al. 1992). In this study, the mood and anxiety module was completed to establish DSM IV Axis I diagnoses including major and minor depression, OCD, generalized anxiety disorder, post-traumatic stress disorder, and panic disorder. It is administered by a trained rater or clinician. In this study, the diagnoses were reviewed by a team including a trained psychiatrist, two psychologists, and a trained rater to confirm the diagnostic decision. For OCD, the kappa coefficient was 0.65, and for current depressive disorder, it was 1.0.

Analysis

Chi-square and Fisher's exact tests were conducted for comparison of dichotomous variables between study participants and non-participants as well as completers and non-completers. *t* tests were performed to compare mean EPDS and OCI-R scores. Proportions were calculated to describe prevalence, incidence, and overlap of depressive and anxiety symptoms and diagnoses.

Results

Demographic characteristics

There were no statistically significant differences between the women who agreed to participate in the study ($N=44$) and those who refused ($N=9$) with regard to maternal age, gestation age, number of children, race, ethnicity, marital status, education, or type of insurance. Of the 44 women who agreed to complete the study, all 44 (100%) completed the OCI-R and EPDS at the initial evaluation, 54.5% ($N=24$) completed, and 45.5% ($N=20$) did not complete the SCID and Y-BOCS (Fig. 1). The primary reason for non-completion of the SCID and Y-BOCS was the inability to schedule and complete the interviews prior to delivery ($N=14$, 70%). One woman completed the SCID prior to delivery but completed the Y-BOCS after delivery. There were no statistically significant differences for completers and non-completers in demographic characteristics except for maternal age which was higher in the non-completers (Table 1).

Prevalence of anxiety and mood symptoms during pregnancy

Symptoms—Of the 44 women who completed the EPDS and OCI-R in the third trimester, 32% ($N=14$) had clinically significant symptoms on either the OCI-R (≥ 15) or the EPDS (≥ 10). Using more conservative cut-points, 27% ($N=12$) had clinically significant symptoms on either the OCI-R (≥ 18) or the EPDS (≥ 13). Of the 14 women with high symptom levels, eight (57%) reached the cut-point on both the OCI-R and the EPDS. Two women (4.5%) met criteria only on the EPDS whereas four (9%) met criteria only on the OCI-R.

Of the 14 women with clinically significant symptoms described above, seven completed the Y-BOCS and SCID. Of these seven women, six had initial high OCI-R scores and had an initial Y-BOCS score in the mild to moderate range; one had a sub-threshold OCI-R score of 13 and a Y-BOCS score of 10 (mild range), four had a high initial EPDS score, but only one of those did not also have a high OCI-R (Table 2). Of the final sample of 24 women who completed the SCID and Y-BOCS, 29% (7/24) had high anxiety and/or depressive symptoms levels based on the OCI-R and EPDS (Table 2).

Diagnoses—Of the 24 participants who completed the SCID in the third trimester, 10 (42%) met criteria for a current mood or anxiety disorder based on the SCID, seven of whom met criteria for OCD (Table 2). Of the 10 women who had an active diagnosis, three had a history of a depressive disorder. Only one woman had a history of a depressive disorder who did not also have a current mood or anxiety disorder. The three women with unipolar major depression reported pregnancy onset of their current depressive episode. Five of the seven women with OCD reported childhood onset (ages 5–9) with the remaining two of unknown onset. Similarly, four out of five of the women with other anxiety disorders reported a childhood onset (ages 7–13). Thirteen (54%) had no current or previous mood or anxiety diagnoses.

OC Symptoms

In the third trimester, based on the Y-BOCS, the most common obsessions were symmetry, fear of contamination, and intrusive thoughts. The most common compulsions were hoarding, checking, and cleaning. While the intensity of symptoms was greater at 1 month postpartum than during pregnancy, the symptom characteristics did not change.

Changes in symptom levels in the postpartum period

Of the 24 women who completed the SCID during the third trimester, 16 (67%) completed the 1-month postpartum follow-up, seven (29%) completed the 3-month postpartum follow-up, and 12 (50%) completed the 6-month postpartum follow-up (Fig. 1). Because of the very small number of subjects who completed all postpartum follow-ups, only data for changes from pregnancy to the 1-month postpartum follow-up are presented.

At 1 month postpartum, of the 16 women who completed the follow-up, seven (44%) had Y-BOCS or EPDS scores that were at or above the cut-points (Table 3). Five had clinically significant Y-BOCS scores (>8), two of whom initially had sub-clinical Y-BOCS scores (<8). Six had clinically significant EPDS scores at 1 month and of these six women, four initially had sub-clinical scores (<10 ; Table 3).

Discussion

Pregnancy

In this small prospective longitudinal study of a general population of obstetrical patients at an academic medical center, a higher than expected proportion of women in their third trimester of pregnancy met criteria for high levels of anxiety or depressive symptoms based on the OCI-R and/or EPDS (27–32% depending on cut-point criteria). Additionally, the prevalence of diagnosed OCD was much greater than predicted based on studies of the general population indicating 1–2% for OCD and 6% for sub-threshold OCD. Twenty-nine percent of the women who completed the SCID met criteria for OCD, making it a more common diagnosis than depression which was found in 17%. It is not clear why this population, which is relatively heterogenous, would be predisposed to these high rates. One potential explanation is that the sample tended to be women who were in a lower socioeconomic spectrum (based on receiving government insurance) and thereby, potentially, were at higher risk for anxiety and mood disorders. Another possibility is that the high rates reflect a selection bias in that women with OCD may have been interested in participating or more likely to complete the interview. We do not know the prevalence of OCD among the non-participants ($N=38$), but if we assumed that none met criteria for OCD, the rate would be 8% and still exceed the expected rate in a general population of women. This finding indicates that it may be that perinatal women not only experience higher levels of expected anxiety but for those who are predisposed, or previously had sub-threshold OCD, the anxiety rises to such level as to meet criteria for OCD during pregnancy. Whatever the explanation, this finding is particularly important as clinical and research studies have focused on the detection and treatment of perinatal depression, not

perinatal anxiety. Furthermore, more than half (57%) of the women with OCD had a co-morbid mood or anxiety disorder highlighting that these women may be at particularly high risk during and after pregnancy and may require further specific study. Ultimately, the goal should be to move toward improving identification of anxiety disorders, including OCD, during pregnancy to provide targeted interventions to improve both maternal and child outcomes.

One month postpartum

In this small sample of women who completed the follow-up telephone assessment ($N=16$), close to one third (31%) reported scores of 8 or greater on the Y-BOCS at 1 month postpartum. New onset of postpartum OCS, based on changes in Y-BOCS scores from the third trimester to 1 month postpartum, was reported by two women accounting for a 12.5% incidence. This finding, while a small number, is particularly important as neither of these women met criteria for any depressive or anxiety diagnosis during the first trimester and both had very low OCI-R and Y-BOCS scores during pregnancy. One did have an initial EPDS score of 9 in the third trimester but otherwise there was no indication of an anxiety disorder. This finding is much higher than the 4% incidence found in the only other prospective longitudinal study conducted in Turkey (Uguz et al. 2007a) and much higher than incident rates among the general population (Kessler et al. 2005) but must be interpreted carefully due to the small sample size and the potential sample bias as there was a drop-out rate of 33%. However, it is important to explore whether new onset OCS are at higher rates in the first month postpartum and to distinguish these women, their risk factors, symptom changes, and prognosis compared to women with pre-existing high rates of OCS and/or OCD during pregnancy.

In comparison to OCS, there was a higher prevalence of high levels of postpartum depressive symptoms and an incident rate that was twice that of postpartum OCS. Over 37% of women reported EPDS scores of 10 or greater, four (25%) women of whom had a new onset of high scores. While these rates are higher than expected, especially the incident rate, they are consistent with previously reported prevalence rates among low-income women in the postpartum period (Chaudron et al. 2004).

Many retrospective studies have reported a perinatal onset of OCS or OCD. Our study found that while there were some women who experienced a new onset of symptoms of OCS postpartum, the majority of women with diagnosed OCD during pregnancy had long-standing symptoms since childhood and none of the women reported pregnancy onset of OCS. In contrast, all of the women with unipolar major depression reported onset of the depressive episode during pregnancy and there was also a higher rate of new onset of postpartum depressive symptoms than anxiety symptoms. Our findings regarding onset of OCS may differ from other studies that rely on retrospective recollection in which women may become more aware of their OCS during pregnancy and therefore may attribute their onset to that time period. Future prospective studies in larger samples are crucial to determine the symptom onset, changes, and patterns in the perinatal period, to better understand the co-morbidity and relationship of perinatal OCS/OCD and depression, and to inform future studies of the potential neurobiological mechanisms of perinatal OCS and OCD.

Screening tools

This study was not designed or powered to explore the validity of the OCI-R or the EPDS in the identification of women with perinatal OCD. However, if, as our findings suggest, anxiety is more prominent than depression during pregnancy, researchers and clinicians may need to re-evaluate the preferred screening tools. Previous studies have explored the potential for the EPDS to identify anxiety (Matthey 2008) but future studies are needed to explore the validity of screening tools to accurately identify perinatal anxiety disorders, including OCD.

This study has strengths and limitations. The primary strength is its prospective longitudinal design across the perinatal period and its use of the SCID to determine the prevalence of mood and anxiety diagnoses during pregnancy rather than relying on screening tools or symptom reports. The design enabled us to capture new onset OC and depressive symptoms in the postpartum period and to compare them to the symptoms experienced during the third trimester. These findings contribute to the growing body of knowledge regarding perinatal OCS and OCD. However, the study limited our ability to comment on the fluctuation of symptoms or new onset of symptoms after 1 month postpartum because the majority of women did not complete all follow-up screens. The study sample is another strength as it represents a more general population of pregnant women than previous studies. The women were recruited from an obstetrics clinic, were racially and educationally diverse, and had an equal distribution of partnered and single women. It is limited in its generalizability for a variety of reasons including: (1) the sample was recruited from only one urban academic medical center clinic, (2) the majority were receiving government insurance thereby possibly representing a lower income group of women who may be at higher risk for mood and anxiety disorders, (3) the small sample size, and (4) the high rates of initial refusals and attrition. Larger, more diverse samples are needed to understand the phenomenology of perinatal OCD and establish its relationship to postpartum depression.

Conclusions

OCD and OCS may be of greater prevalence and importance during the perinatal period than previously recognized. The findings suggest an influence of prenatal OCD/OCS on postpartum depression. Research in the perinatal period must expand beyond the exploration of depression to include an understanding of the phenomenology and etiology of anxiety disorders and specifically OCD during the perinatal period. It must also expand to provide valid and reliable tools for the detection of perinatal OCD.

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Fig. 1.
Recruitment and retention of subjects

Table 1

Demographic characteristics of completers versus non-completers

Variable	Completers (N=24)	Non-completers (N=20)
Maternal age, mean (SD)	24.71 (SD=5.5)	28.05 (SD=5.4)*
Range	18–41	20–38
Maternal gestation (weeks)		
Mean (SD)	32.63 (2.5)	33.25 (SD=1.9)
Range	27–38	30–36
Number of children, N (%)		
0–1	19 (79)	13 (65)
≥2	5 (21)	7 (35)
Ethnicity, N (%)		
Hispanic	4 (17)	6 (30)
Non-Hispanic	20 (83)	14 (70)
Race, N (%)		
Caucasian	11 (46)	6 (30)
African-American	10 (42)	8 (40)
Other	3 (12)	6 (30)
Marital status, N (%)		
Married, with partner	12 (50)	11 (55)
Single, divorced	12 (50)	9 (45)
Education, N (%)		
≤HS grad	16 (67)	14 (70)
>HS education	8 (33)	6 (30)
Insurance, N (%)		
Government	15 (63)	14 (70)
Private	8 (33)	5 (25)
None	1 (4)	1 (5)
EPDS, mean (SD)	6.1 (5.2)	8.0 (5.1)
OCI-R, mean (SD)	12.3 (13.3)	9.0 (9.0)

* $p \leq 0.05$, statistically significant

Table 2

Subjects with SCID diagnosed mood or anxiety disorders during the third trimester

Subject	OCL-R	EPDS	Y-BOCS	Current mood disorder	Current anxiety disorder	History of depressive disorder
A	7	4	3	–	–	Yes
B	9	6	0	Major depression	–	–
C	11	3	3	–	Specific phobia	Yes
D	11	10	3	–	Specific phobia	Yes
E	13	8	10	–	OCD	–
F	15	9	10	–	OCD	–
G	18	1	8	–	OCD	Yes
H	20	6	Did not complete	–	OCD Panic disorder	–
I	36	12	11	Major depression	OCD	–
J	41	15	18	Major depression	OCD PTSD	–
K	54	22	22	Bipolar, depressed phase	OCD PTSD	–

Table 3

Symptom levels and changes in Y-BOCS and EPDS scores among subjects who met cut-point criteria at 1 month postpartum

Subject	Pregnancy EPDS	Postpartum EPDS	Pregnancy Y-BOCS	Postpartum Y-BOCS	Pregnancy diagnosis
A	4	10	3	22	History of depression
D	10	11	3	5	Specific phobia History of depression
E	8	12	10	0	OCD
F	9	11	10	15	OCD
H	6	1	–	19	OCD Panic disorder
J	15	17	18	20	OCD PTSD Major depression
L	9	14	7	20	None