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Onset and Exacerbation of Obsessive-Compulsive Disorder in Pregnancy and the Postpartum Period

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Abstract

Background—The primary goal of this study was to examine the impact of pregnancy, childbirth and menstruation on the onset of obsessive-compulsive disorder (OCD) and/or exacerbation of OCD symptoms.

Method—One hundred twenty-six women attending a university-based OCD clinic aged 18-69 years who met DSM-IV criteria for OCD according to the Structured Clinical Interview for DSM-IV Disorders were interviewed retrospectively to assess OCD onset and symptom exacerbation in relationship to reproductive events. Women were placed into two groups: ever pregnant (Preg) and never pregnant (NPreg). The Preg group was further subdivided into those who reported onset of OCD in the perinatal period (perinatal-related, PR) and those that denied onset related to pregnancy (non-perinatal-related, NR). Between groups comparisons were done using a Student's t-test for continuous measures and categorical variables were assessed using the chi-square test.

Results—Of the 76 women in the Preg group, 32.1% (N = 25) had OCD onset in the perinatal period (PR group), 15.4% in pregnancy, 15.4% at postpartum, and 1.3% following miscarriage. Out of 132 total pregnancies, 34.1% involved an exacerbation of symptoms, 22.0% involved an improvement in OCD symptoms, and 43.9% did not change symptom severity in women with pre-existing illness. Women in the PR group and women with perinatal worsening of pre-existing OCD were more likely to have premenstrual worsening of OCD symptoms compared to NR women (65.5% vs. 39.3%, p = 0.047).

Conclusion—Findings from this study provide additional evidence that pregnancy and childbirth are frequently associated with the onset of OCD or worsening of symptoms in those with pre-existing disorder. In addition, there appears to be continuity between OCD onset and/or exacerbation across the reproductive life cycle, at least with menstruation and pregnancy.

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INTRODUCTION

The perinatal period represents a time of increased vulnerability to psychiatric disorders, particularly depression, psychosis, and the largely understudied obsessive-compulsive disorder (OCD).[1,2] OCD is a heterogeneous disorder in that it can present with a wide variety of obsessions and compulsions. Despite this diversity of symptoms, studies reveal a consistent pattern during the perinatal period with regard to content of the obsessions and compulsions.[3] For example, it appears that contamination obsessions and washing or cleaning rituals are prevalent during pregnancy, while postpartum OCD tends to be manifested as ego-dystonic intrusive obsessional thoughts of harming the infant, accompanied by avoidance behaviors or checking rituals.[3-8] In contrast to the gradual onset of typical OCD, postpartum OCD appears to be characterized by the rapid onset of obsessional symptoms after the birth, with onset as early as the second postpartum day with a mean time to onset of 2.2 to 3.7 weeks.[7,9] OCD in pregnancy and the postpartum period often goes undiagnosed and thus untreated, resulting in adversity for the patient, her family, and the newborn.

Many studies in recent years have focused on pregnancy and postpartum depression or psychoses, but few studies have been devoted to examining OCD in the perinatal context. As noted in a review by Abramowitz, interpretation of findings from early studies is complicated by antiquated diagnostic methods and/or relatively small sample sizes, in addition to being primarily case series and retrospective reports.[3] The onset of OCD symptoms associated with pregnancy and the postpartum reported in the literature ranges from 2% to 40% and 7% to 21%, respectively.[4,5,10-14] The wide range of percentages reported may be a result of the differing methods of data collection, lack of uniform diagnostic criteria, and the innate differences in patient populations. In addition, there is some evidence of exacerbation of pre-existing OCD in the perinatal period. Worsening of pre-existing OCD has been reported in 8% to 16% of patients during pregnancy and 29% to 50% in the postpartum.[5,14] To date, however, no studies have confirmed reports of perinatal worsening of OCD with prospective ratings, and only one prospective study has looked at the prevalence of OCD during pregnancy (third trimester, 3.5%).[15] Thus, the exact incidence of pregnancy or postpartum onset OCD, or the prevalence rates of OCD exacerbation in the perinatal period is unknown.

Just as pregnancy and/or childbirth appear to exacerbate or contribute to the onset of OCD, a subset of women with OCD also experience an exacerbation of their primary symptoms during the premenstruum. It has been theorized that changes in the neuroendocrine milieu, estrogen and progesterone in particular, are likely contributors to the worsening of OCD in such cases.[16,17] Premenstrual worsening of OCD has been reported in 20% to 42% of women in retrospective reports.[5,14] A study by Labad et al, found that OCD onset occurred in the same year as menarche in 22% of their subjects, and that premenstrual mood symptoms (including anxiety, irritability, mood lability, and depressed mood) were associated with both premenstrual worsening of primary OCD symptoms, and onset or worsening of OCD during the puerperium.[12] In addition, patients with an onset or exacerbation of OCD during the puerperium more frequently reported premenstrual worsening of symptoms and a previous history of major depressive disorder, including

postpartum depression.[14] Premenstrual dysphoria and high rates of postpartum depression have also been described in female OCD patients in general.[5,18] Likewise, women with a history of premenstrual syndrome are at higher risk for postpartum depression and psychosis.[19] To link all of these observations, it has been proposed that a common dysregulation of serotonergic neurotransmission, which can be accentuated by ovarian steroid fluctuations, may be involved in the pathophysiology of OCD, postpartum depression, and premenstrual syndrome.[20,21]

The primary goal of this study was to examine the impact of pregnancy, childbirth and menstruation on the onset and/or exacerbation of OCD in women attending a university-based OCD Clinic. In addition, we sought to examine the relationship between reports of menstrual cycle exacerbation in OCD symptoms and onset or exacerbation of OCD during pregnancy and the postpartum. We hypothesized that women with OCD who reported perinatal onset or exacerbation of their symptoms would be more likely to experience premenstrual exacerbation of their OCD symptoms than those women with OCD who had at least one previous pregnancy without perinatal onset or exacerbation of their disorder. Furthermore, we hypothesized that the women with perinatal onset or exacerbation of OCD would report a more acute onset of symptoms (versus a gradual onset more typically seen in OCD), corresponding to the dramatic alteration in hormone levels associated with pregnancy and parturition.

METHODS

Subjects and Recruitment

The data for this study were drawn from the medical records and interviews of women referred to the Yale OCD Clinic on the Clinical Neuroscience Research Unit at the Connecticut Mental Health Center in New Haven, CT. The patients in the Clinic were referred for clinical evaluation or participation in clinical research approved by the Institutional Internal Review Board at Yale University School of Medicine. All subjects gave signed informed consent for participation in the research study being conducted at the time of enrollment.

Patients enrolled in treatment protocols in the Yale OCD Clinic are administered a number of clinical assessments including a diagnostic interview, OCD severity ratings and depression inventories via the Structured Clinical Interview for DSM-IV Disorders[22] (SCID), the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) and the Yale Depression Inventory (YDI), respectively.[23] This information was obtained from each participant's Clinic record. Data was obtained from women between age 18 and 69 years who met DSM-IV criteria for OCD according to the SCID and had no lifetime history of an Axis I psychotic disorder or substance dependence disorder within the previous year. All participants were fluent in English.

Interview

According to consenting procedures, women who were already discharged from the OCD Clinic (13.6%) were sent a letter notifying them that a staff member would be contacting

them to conduct an interview of approximately 30 minutes duration. Those who wished not to participate could indicate so by return mail or by phone. If such a request was not received, assent for participation was assumed and subjects were contacted by phone to conduct the interview. Individuals who were actively enrolled in the OCD Clinic (86.4%) were interviewed when they presented for a scheduled appointment. None of the active subjects refused to complete the interview.

The primary goal of the semistructured interview, from which data for this study was extracted, was to develop a complete database of all the patients (both male and female) who had been or were enrolled in the OCD Clinic. Patients were asked information regarding demographic data, clinical features of OCD and other psychiatric and medical history. The demographic data included information on age, sex, marital status (single, married, divorced, widowed), race, level of education, and occupation. The clinical features of OCD data consisted of age at onset of obsessive-compulsive (OC) symptoms and age of onset of symptoms sufficient to meet DSM-IV criteria for the disorder. Patients were asked to characterize their obsessions and compulsions from a list of target symptoms, as well as describe the onset (acute vs. gradual) and course of the disease over their lifetime (episodic vs. chronic).

All female patients were asked questions regarding the relationship of their OCD symptoms to reproductive events. Their obstetrical history was based on self-report: number of pregnancies, terminations, miscarriages, and gestational age at delivery. Women were asked to describe if they experienced changes in their OCD symptoms (worsening, improvement or no change) during the premenstruum. Women who had experienced at least one pregnancy were asked if the onset of OCD was related to pregnancy, pregnancy loss or termination (if any), or the postpartum period. In addition, for each pregnancy women were asked if they experienced exacerbation, improvement or no change in their OCD symptoms during these reproductive events. While there were subjects in perimenopause and menopause, the small number of women in this category was insufficient to be included in a separate analysis.

Other variables included in the database were: history of substance use, medical history, prior psychiatric history (including co-morbid psychiatric illness), family history, and physical or psychological trauma.

Group Assignment

For the purposes of this study, women were placed into one of two groups; Ever Pregnant (Preg) and Never Pregnant (NPreg) by virtue of self-report of their obstetrical history. Those women who were in the Preg group were further subdivided according to the following parameters: those who reported onset of OCD during pregnancy or the puerperium were assigned to the Perinatal-Related (PR) group while those that denied onset of OCD related to pregnancy were assigned to the Non-Perinatal-Related (NR) group.

Statistical analysis

All data were summarized using descriptive statistics (means, SDs, frequencies). Continuous measures were compared between groups using a Student’s t-test and categorical variables

were assessed using the chi-square test. All analyses were considered statistically significant at $p < 0.05$ and performed using SAS, version 9.1.

RESULTS

Subjects: Pregnant versus Never Pregnant Group Comparisons

Of the 140 women in the database, 126 had sufficient data on OCD symptoms in relation to their reproductive history to be included in the study. The data from the remaining 14 subjects were not included in any analyses. Seventy-eight women reported having had at least one pregnancy (Preg Group), while 48 women reported never having been pregnant (NPreg Group). Descriptive information for the Preg and NPreg groups is presented in Table 1. Mean age ± SD at presentation to the Yale OCD Clinic was significantly younger in the NPreg Group (32.6 ± 13 years) than the Preg Group (40.8 ± 10.8 years) ($t = 3.82$, $df = 123$, $p < 0.0002$). However, there was no significant difference in age at onset of OCD in the Preg Group (26 ± 9 years) compared to the NPreg Group (23.8 ± 10.6 years) ($t = 1.22$, $df = 120$, $p = 0.70$). Compared to women in the NPreg Group, women in the Preg Group were more likely to be married ($X^2 = 40.5$, $df = 2$, $p < 0.0001$) and less educated ($X^2 = 6.4$, $df = 2$, $p = 0.04$). Finally, there were no significant differences regarding comorbid diagnoses or family psychiatric history (including only professionally diagnosed illness). The majority of women in both groups reported a personal (65.1%) and family (85.7%) history of depression, substance abuse, and/or other anxiety disorder. Of the women who reported having co-morbid psychiatric diagnoses, the majority (in all groups) said that OCD presented first.

Pregnancy Related Onset versus Onset Unrelated to Pregnancy Subgroup Comparisons

Of the Preg group, 24 (30.8%) fell into the PR subgroup by virtue of having reported the onset of OCD to be related to either pregnancy, fetal loss, or the postpartum period. Twelve women in the PR subgroup (15.4%) reported onset during pregnancy, 1 (1.3%) had onset after a miscarriage, and 11 (14.1%) had onset during the postpartum period. Thus, approximately half of the PR subgroup experienced onset during pregnancy while the other half experienced onset during the puerperium. Table 1 provides descriptive information for the PR and NR subgroups. Mean age SD on admission for the PR (39.3 ± 8.2 years) and NR (41.5 ± 11.8) groups was similar, as was age at onset of OCD (PR subgroup 27 ± 7.1; NR subgroup 25.6 ± 9.8). There were only two significant differences in between subgroup comparisons. First, more women in the NR (22.2%) than in the PR subgroup (4.2%) carried a comorbid diagnosis in the “other” category ($X^2 = 3.9$, $df = 1$, $p = 0.05$). This category included diagnoses such as trichotillomania, eating disorders, and Tourette’s syndrome. Second, women in the NR subgroup (22.2%) were more likely to report a family history of substance abuse than women in the PR subgroup (4.2%) ($X^2 = 3.9$, $df = 1$, $p = 0.05$). While the YBOCS scores obtained on admission to the OCD Clinic were available on roughly half of the women in each subgroup, there was a trend for women in the PR (29.5 ± 7.0) to have higher YBOCS scores than women in the NR subgroup (25.7 ± 4.9) ($t = 1.93$, $df = 35$, $p = 0.06$). YBOCS scores in this range are consistent with moderate to severe illness. This is reflected in the baseline global assessment of function (GAF) scores which were lower in the PR subgroup (51.6 ± 7.1), but not significantly different from that in the NR (56.3 14.0).

Course and Characteristics of OCD

Preg and NPreg Group Comparisons—As stated, there was no significant difference found between the Preg and NPreg groups in the age of onset of OCD, and the vast majority (greater than 95%) described their course of illness as chronic rather than episodic (data not shown). As seen in Table 2, a greater proportion of women who had been pregnant reported acute onset of symptoms (47.8%), but this did not differ statistically from women who had never been pregnant (30.6%) ($X^2 = 2.56$, df = 1, p = 0.11).

The frequency of specific types of OCD symptoms in the Preg and NPreg groups is depicted in Table 3. Significant differences in specific types of symptoms were present only for ordering/arranging compulsions ($X^2 = 5.51$, df = 1, p = 0.02), religious/scrupulosity obsessions ($X^2 = 6.01$, df = 1, p = 0.01), and miscellaneous compulsions ($X^2 = 6.633$, df = 1, p = 0.01). There was also a trend for women in the NPreg Group to report having sexual obsessions ($X^2 = 3.25$, df = 1, p = 0.07) and a greater number of symptoms overall (t = 1.8, df = 123, p = 0.07). PR and NR Subgroup Comparisons:

Women with pregnancy-related onset of OCD had a similar number of pregnancies as those with OCD onset unrelated to pregnancy (Table 2). Onset of OCD with pregnancy was most likely to occur during or after the first pregnancy. A majority of women in the PR subgroup (61.9%) reported acute onset of OCD symptoms compared to 41.7% in the NR subgroup; however, this difference was not statistically significant ($X^2 = 2.4$, df = 1, p = 0.12). Of the 11 women who reported postpartum onset of OCD, 10 answered the question of how long after delivery their symptoms began. Seven out of the 10 reported that the onset of their OCD occurred “right away,” while the remainder reported onset of symptoms within the first 6 months after delivery.

The type of obsessions and compulsions reported as primary symptoms by the PR and NR subgroups is described in Table 3. Only obsessions regarding contamination were significantly greater in the PR subgroup (66.7%) versus the NR subgroup (35.9%) ($X^2 = 6.33$, df = 1, p = 0.01). Although approximately 21% of women in both subgroups experienced obsessions regarding harming their infant in the postpartum period, there was no statistically significant difference between the groups.

Changes in Existing OCD During Pregnancy and the Premenstruum: Group and Subgroup Comparisons—Women in the Preg group who had onset of OCD prior to becoming pregnant reported worsening of symptoms with pregnancy in 45 (34.1%) cases, no change in 58 (43.9%), and improvement in 29 (22.0%). These results are reported in terms of pregnancies (rather than percentage of women) since nine women reported an exacerbation of OCD symptoms during one pregnancy, yet an improvement or no change during another. Women in the Preg and NPreg groups experienced worsening of symptoms prior to menses at approximately the same rate (49.3% of Preg, 51.6% of NPreg – see Table 2). When women in the PR group were combined with those women who had OCD prior to pregnancy but reported pregnancy-related worsening, there was a significant association with premenstrual worsening of OCD symptoms compared to the NR group, 66% (N = 19) vs. 39% (N = 11), respectively ($X^2 = 3.93$, df = 1, p = 0.047).

DISCUSSION

In addition to the physiologic changes during pregnancy and childbirth, there are considerable psychological and interpersonal demands on women during the transition to motherhood. The findings from our study add to the growing literature suggesting that pregnancy and childbirth can trigger the onset of OCD or the exacerbation of the ongoing disorder in a substantial number of women. Our finding that approximately 30% of women experienced a perinatal-related onset of the disorder is similar to that reported by others (15%-40%).[4,13] The comorbidity rate of about 65% of mood disorders (primarily major depression) in both groups of women is also consistent with the results of previous research.[24] However, in this sample and with the measures available, we did not find a significant difference between the groups in terms of family history of OCD or postpartum OCD and affective disorders.

While there was no statistically significant difference between the two groups of pregnant women, there was a difference in age, marital status and education between the NPreg and Preg groups. The Preg group was older, more likely to be married (70.1%) and had a greater proportion (40.8%) with a high school education or less. The majority of the NPreg group (78.5%) had some college education. The difference in education between the groups might indicate that women pursuing higher education are more likely to postpone getting married and having children. Similarly, by being a younger, NPreg group is less likely to be married and have children. Therefore, difference between these groups is most likely a factor of “pregnancy” and not illness severity or symptomatology.

The predicted relationship between pregnancy-related onset and/or exacerbation of OCD symptoms and worsening of OCD symptoms in the premenstruum was confirmed, suggesting that there is a “hormone related” subtype of OCD in women. Women with pregnancy-related onset of OCD or perinatal worsening of pre-existing OCD are more likely to experience premenstrual exacerbation of their OCD symptoms when compared to those women whose onset of OCD did not coincide with pregnancy and whose symptoms appeared to be unaffected by pregnancy. This latter finding is similar to what has been observed between premenstrual dysphoric disorder (PMDD) and postpartum depression (PPD), namely women with premenstrual negative affect are more likely to experience depression in the postnatal period.[25] This suggests that there may be a subgroup of women with differential sensitivity to reproductive hormones, and as such normal reproductive events are triggers for onset or exacerbation of OCD. Our results about changes in OCD symptoms during pregnancy are in agreement with previous studies that have found both improvement and worsening of symptoms at this reproductive event.[5,14,15] Again this points to a potential vulnerability to gonadal steroids. The biological basis for this differential sensitivity remains unknown, but it has been speculated to represent the effect of genetic polymorphism in genes that regulate reproductive hormone signaling or that are regulated by reproductive hormones.[25]

While gonadal steroids and their interaction with serotonin have been implicated in this “hormone related” subtype of OCD, oxytocin is another hormone that is possibly implicated in these observations. Oxytocin is critically involved in the initiation of maternal behavior in

animals,[26] and cerebrospinal fluid (CSF) levels of oxytocin are elevated during the third trimester of pregnancy and the early puerperium. In addition, animal models have shown an increase in oxytocin mRNA in the female brain during puberty.[27] There is growing evidence to suggest that oxytocin may play a role in the pathogenesis of some forms of obsessive-compulsive disorder (OCD).[28] Obsessions regarding the safety of others and dirt and germs, as well as compulsions such as checking and cleaning might be seen as pathological correlates of normal maternal behavior. Furthermore, oxytocin, in one study but not in another, has been reported to be elevated in the CSF of patients with OCD compared with age and sex-matched normal control subjects.[29] Further work is needed in this area to be able to draw any definitive conclusions, but the potential role of oxytocin in the exacerbation of OCD symptoms during the reproductive years should be considered.

Although, a majority of women in the PR subgroup reported acute onset of OCD symptoms, our hypothesis that this would differ significantly from that reported by women with onset unrelated to pregnancy was not supported. Perhaps this is the case because acute onset of OCD is not uncommon, occurring in 28% of cases, and up to 64% of patients report significant life events (major medical illness, loss of a loved one, marriage, job promotion, etc.) in relationship to OCD onset.[30] It could be the case that the birth of a child is a trigger for OCD onset as a result of being a major life event, independent of the impact of the hormonal milieu or psychological milestones specific to becoming a parent.

Consistent with prior research, the PR group was more likely to report contamination obsessions than the NR group. Interestingly, however, there was no significant difference between the groups in obsessions or compulsions related to typical postpartum maternal behaviors (i.e., checking, cleaning, ordering/arranging). We hypothesized that women with postpartum OCD would be more likely to have these types of symptoms as abnormal manifestations of normal maternal behaviors related to infant care. In addition, there was no significant difference found between the PR and NR groups in terms of having aggressive obsessions. Perhaps this is secondary to our finding of fewer than expected women (25%) in the PR group with aggressive obsessions towards their offspring. Women may have been resistant to admitting these symptoms as a result of the stigma surrounding having these thoughts. Furthermore, aggression and contamination obsessions and checking and cleaning compulsions are the most common OCD symptoms, reported by 50-75% of patients with OCD.[31]

Based on the retrospective studies, as many as 11% to 47% of women have their first onset of OCD in the peripartum period.[5,6,32] Our results also suggest that both pregnancy and the postpartum may be periods of risk for the initiation of OCD, with the two periods conferring relatively equal risk. However, OCD in the peripartum period is likely an under-diagnosed entity. Thus, it is crucial for healthcare providers to inquire about these problems and be aware of their potential consequences, so that early intervention may take place. For example, women should be reassured that the occurrence of intrusive ego-dystonic thoughts is common, so that they may receive appropriate care without having to suffer in silence. In addition, even if no physical harm is done to the infant as a result of a mother's obsessional thoughts, these thoughts may negatively affect the infant's development in a variety of ways. Mothers who fear harming their infants may avoid them as a result, preventing the

development of a secure mother-child relationship and affecting proper infant care. Moreover, these obsessional thoughts likely affect a mother's confidence in her abilities, and may further hinder the development of a close relationship with her child.[33] Increasing data shows that a poor early interaction between the parent and the infant may have long-term detrimental effects on the child, including increased vulnerability to stress and an increased risk for developing psychiatric disorders later in life.[34,35] Animal studies have also highlighted the importance of early mothering in determining the future maternal behavior of the adult offspring.[36,37]

That approximately half (46-56%) of all of the women in this study, regardless of pregnancy history, reported a worsening of OCD symptoms during the premenstruum suggests that clinicians should consider the premenstruum as a trigger for symptom exacerbation and make decisions regarding treatment accordingly. Women with OCD who feel that their symptoms worsen in the premenstruum should keep a daily diary of symptom severity similar to that which is done by women undergoing evaluation for premenstrual dysphoric disorder. As a goal for future research, it would be interesting to prospectively assess the premenstruum and the puerperium in the same group of patients to determine if worsening of OCD during the premenstruum could act as a predictor of worsening or onset related to pregnancy.

The results of this study, and prior research, are limited by their reliance on retrospective recall. Patients often cannot accurately determine precise details of symptom history or events related to onset potentially leading to recall bias. Women who participated in this study varied in the number of years since onset of OCD. Thus, recall of events proximal to the onset of OCD may have become linked to disorder onset. For some women this may have limited their ability to distinguish between pregnancy and the postpartum period when asked to recall changes in their symptoms at that time. In addition, the psychological impact of becoming pregnant and caring for an infant may have brought to the forefront OCD symptoms that may have been present but otherwise undetected or easily managed. This could have led to misclassification of preexisting OCD as new onset in the perinatal period. Given these limitations, definitive conclusions about the relationship between reproductive events and onset or worsening of OCD should be taken with caution. Prospective assessments or assessment more proximal to the time of delivery could address this weakness in the present research. Moreover, future prospective studies are necessary to further clarify the prevalence of OCD during pregnancy and the postpartum period, as well as to identify subgroups of women who may be particularly vulnerable to the development of this disorder.

The generalization of our results is also limited by the patient population studied. Our sample was formed by women attending an OCD research clinic, which may lead to an overrepresentation of women with more severe symptoms and co-morbidities. In addition, the majority of our sample consisted of Caucasian women. Both of these factors limit the generalization of our results to the population at large. However, this is not unlike other studies that have examined OCD in relationship to reproductive events.[5,14] In contrast to prior studies, our study has a never pregnant comparison group, which enhances the importance of our results.

Despite the limitations acknowledged above, our findings provide additional evidence that pregnancy and childbirth are frequently associated with the onset of OCD or worsening of symptoms in those with pre-existing disorder. In addition, the results of our research point to the relatively significant role of gonadal hormones in this phenomenon; there appears to be continuity between OCD onset and/or exacerbation across the reproductive life cycle, at least with respect to menstruation and pregnancy. Appreciating and understanding the role these hormones play in influencing the course of OCD may help to elucidate potential neurobiological mechanisms of this psychopathology, and will hopefully lead to the development of new concepts in treatment. However, concurrent with these hormonal fluctuations are dramatic and potentially stressful changes in the mother's psychosocial and interpersonal situation. Future studies will need to be designed in such a manner to begin to tease apart the relative contributions incorporated in the biopsychosocial model of the pathogenesis of OCD in the perinatal context.

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Table 1
Demographic and Clinical Information

		Ever Pregnant		
	Never Pregnant (N = 48)	All Pregnant Women (N = 78)	Pregnancy-related OCD Onset (N = 24)	OCD Onset Unrelated to Pregnancy (N = 54)
	Mean±SD or N(%)	Mean±SD or N(%)	Mean±SD or N(%)	Mean±SD or N(%)
Age on Admission	32.6 ± 13.0[a]	40.8 ± 10.8[a]	39.3 ± 8.2	41.5 ± 11.8
Race				
Caucasian	47 (98)	69 (92)	21 (91.3)	48 (92.3)
Hispanic	1 (2)	5 (6.7)	1 (4.4)	4 (7.7)
Other	0 (0)	1 (1.3)	1 (4.3)	0 (0)
Marital				
Single	31 (64.6)[b]	8 (10.4)[b]	4 (16.7)	4 (7.6)
Married	14 (29.2)	54 (70.1)	16 (66.7)	38 (71.7)
Divorced	3 (6.3)	15 (19.5)	4 (16.7)	11 (20.7)
Education				
High School or less	10 (21.3)[c]	31 (40.8)[c]	8 (33.3)	23 (44.2)
Technical school or partial college	17 (36.2)	15 (19.7)	6 (25.0)	9 (17.3)
College or professional school	20 (42.3)	30 (39.5)	10 (41.7)	20 (38.5)
Baseline Y-BOCS	25.1 ± 5.9	27.0 ± 5.9	29.5 ± 7.0	25.7 ± 4.9
Baseline GAF	55.4 ± 10.9	54.8 ± 12.3	51.6 ± 7.1	56.3 ± 14.0
Age onset of OCD	23.8 ± 10.6	26.0 ± 9.0	27.0 ± 7.1	25.5 ± 9.8
Number prior psych hospitalizations	0.9 ± 1.5	1.0 ± 1.7	1.2 ± 2.0	0.9 ± 1.6

Abbreviations: OCD = Obsessive-Compulsive Disorder, Y-BOCS = Yale-Brown Obsessive Compulsive Scale, GAF = Global Assessment of Functioning.

[a] p = 0.0002.

[b] p = 0.0001.

[c] p = 0.04.

Table 2

OCD and Reproductive Events

		Ever Pregnant		
	Never Pregnant	All Pregnant women	Pregnancy-related OCD Onset	OCD Onset Unrelated to Pregnancy
	Mean±SD or N(%)	Mean±SD or N(%)	Mean±SD or N(%)	Mean±SD or N(%)
Obstetrical History		N = 78	N = 24	N = 54
Number of pregnancies	N/A	2.5 ± 1.5	2.6 ± 1.5	2.45 ± 1.5
Number of terminations	N/A	0.2 ± 0.4	0.3 ± 0.5	0.2 ± 0.4
Number of miscarriages	N/A	0.1 ± 0.4	0.3 ± 0.5	0.1 ± 0.3
Initial onset of major syndrome	N = 36	N = 69	N = 21	N = 48
Acute	11 (30.6)	33 (47.8)	13 (61.9)	20 (41.7)
Gradual	25 (69.4)	36 (52.2)	8 (38.1)	28 (58.3)
Symptom changes prior to menses	N = 31	N = 71	N = 18	N = 54
No change	14 (45.2)	31 (43.7)	7 (38.9)	24 (44.4)
Worse	16 (51.6)	35 (49.3)	9 (50.0)	26 (48.2)
Uncertain	1 (3.2)	5 (7.0)	2 (11.1)	4 (7.4)

Abbreviation: OCD = Obsessive-Compulsive Disorder

Table 3

Major OCD Symptoms

Major OCD Symptoms	Never Pregnant (N = 48)	Ever Pregnant		
		All Pregnant Women (N = 77)[a]	Pregnancy-related OCD Onset (N = 24)	OCD Onset Unrelated to Pregnancy (N = 53)[b]
	N (%)	N (%)	N (%)	N (%)
Aggressive	18 (37.5)	22 (28.6)	5 (20.8)	17 (32.1)
Contamination	23 (47.9)	35 (45.5)	16 (66.7)[c]	19 (35.9)[c]
Sexual	7 (14.6)	4 (5.2)	1 (4.2)	3 (5.7)
Hoarding/saving	6 (12.5)	5 (6.5)	0 (0)	5 (9.4)
Religious/scrupulosity	8 (16.7)[c]	3 (3.9)[c]	1 (4.2)	2 (3.8)
Symmetry/exactness	13 (27.1)	17 (22.1)	6 (25.0)	11 (20.8)
Somatic/illness	4 (8.3)	5 (6.5)	2 (8.3)	3 (5.7)
Misc. obsessions	15 (31)	23 (30)	6 (25.0)	17 (32.1)
Cleaning/washing	23 (47.9)	45 (58.4)	17 (10.8)	28 (52.8)
Checking	27 (56.3)	38 (49.4)	12 (50.0)	26 (49.1)
Repeating	18 (37.5)	24 (31.2)	8 (33.3)	16 (30.2)
Counting	11 (22.9)	12 (15.6)	1 (4.2)	11 (20.8)
Ordering/arranging	3 (6.3)[d]	17 (22.1)[d]	6 (25.0)	11 (20.8)
Collecting	8 (16.7)	5 (6.5)	0 (0)	5 (9.4)
Misc. compulsions	16 (33.3)[c]	11 (14.3)[c]	2 (8.3)	9 (17.0)
Worry – aggression or harm to babies	N/A	16 (20.8)	6 (25.0)	10 (18.9)
Total, Mean±SD	4.2 ± 2.0 (N = 48)	3.7 ± 1.4 (N = 77)	3.7±1.3 (N = 24)	3.6 ± 1.5 (N = 53)

Abbreviations: OCD = Obsessive-Compulsive Disorder, N/A = Not applicable.

[a] Missing data thus the sample size is N = 77.

[b] Missing data thus sample size is N = 53.

[c] p = 0.01.

[d] p = 0.02.