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The impact of perinatal depression on the evolution of anxiety and obsessive-compulsive symptoms

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Abstract

We sought to examine the evolution of postpartum anxiety, obsessions and compulsions over time, and the influence of depression on their clinical course. This was a prospective cohort of obstetric patients enrolled at a tertiary care women's hospital. Women were recruited immediately postpartum and followed for 6 months. Women were screened for depression, state-trait anxiety, and obsessive-compulsive symptoms and dichotomized by the presence of depression. Four hundred sixty-one women agreed to participate in the study and completed the 2 weeks postpartum assessment; 331 (72 %) women completed the assessment at 6 months postpartum. At 2 weeks postpartum, 28 (19.9 %) women with depression had anxiety symptoms, compared to 4 (1.3 %) women who screened negative for depression ($p<0.001$). Similarly, 36 (25.7 %) women with depression endorsed obsessions and compulsions compared to 19 (8.4 %) women without depression ($p<0.001$). A significant interaction effect was present with anxiety over time such that by 6 months postpartum, there were no differences in symptoms in women with and without depression ($p=0.860$). Conversely, the differences in obsessions and compulsions between depressed and non-depressed women persisted ($p=0.017$). Women with postpartum depression are more likely to experience comorbid state-trait anxiety and obsessive-compulsive symptoms in the immediate postpartum period. While state-trait anxiety symptoms tend to resolve with time, obsessive-compulsive symptoms persist. Understanding these temporal trends is critical to tailor appropriate monitoring and treatment.

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Conflict of interest The authors declare that they have no conflict of interest.

Keywords

Perinatal depression; Obsessive-compulsive disorder; State-trait anxiety

Introduction

Peripartum depression is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a subtype of major depressive disorder that begins either during pregnancy or within 4 weeks after delivery (APA 2013). Noted within the description of this diagnosis is the observation that women with peripartum depression commonly have symptoms of anxiety or panic attacks. Although such symptoms are common within an episode of major depressive disorder, many women also have pre-existing anxiety disorders with onset during childhood or adolescence (Pine 2009). Indeed, major depression and generalized anxiety disorder share a common genetic diathesis (Kendler et al. 1992).

The clinical overlap between peripartum depression and anxiety was underscored in a recent large scale study of screening for postpartum depression at 4–6 weeks after birth. Over 90 % of screen-positive women had a primary mood disorder, and 68.5 % of these women had major depressive disorder (Wisner et al. 2013). The majority (65.7 %) of depressed women had comorbid anxiety disorders including generalized anxiety disorder and obsessive-compulsive disorder. Furthermore, women with isolated generalized anxiety in the perinatal period are at an increased risk for the development of depression, and the presence of both conditions yields an increased risk of symptom persistence and treatment resistance (APA 2000; Prenoveau et al. 2013; Skouteris et al. 2009). Finally, the presence of anxiety in the form of obsessive-compulsive disorder (OCD) can obscure the diagnosis of depression; prospective work shows that a diagnosis of OCD predicts a false positive screen on the EPDS and may thereby confound appropriate treatment (Mauri et al. 2010).

Accordingly, identification of the presence of any comorbid anxiety is critical to inform treatment planning and disease management. As postpartum screening for anxiety disorders is not routinely performed, the diagnosis of a comorbid anxiety disorder is often masked by the diagnosis of depression. Thus, understanding of the phenomenology of symptom expression and the course of perinatal depressive and anxiety disorders remains limited.

We sought to analyze postpartum state-trait anxiety as well as obsessive-compulsive symptoms (OCS) through the lens of postpartum depression. We hypothesized that women who screened positive for postpartum depression would be more likely to experience anxiety and OCS compared to those without depression, and that these symptoms would be more likely to persist over time.

Materials and methods

This is a secondary analysis of a large prospective cohort recruited between June and September 2009 at Northwestern Memorial Hospital in Chicago, Illinois. A detailed description of the methods has been previously reported (Miller et al. 2013). Briefly, before discharge from the hospital after delivery, women were asked to participate in the study, and

demographic information, obstetric clinical data, and a psychiatric history were collected. Women were contacted at 2 weeks and 6 months postpartum and at each time, completed self-reported mental health screens for depression, anxiety, and OCS (Patient Health Questionnaire, State-Trait Anxiety Inventory, and Yale-Brown Obsessive-Compulsive Scale and Checklist).

The Patient Health Questionnaire (PHQ-9) is a self-administered depression measure that assesses the 9 DSM-4 diagnostic criteria for depression, with responses ranging from 0 (not at all) to 3 (nearly every day) (Spitzer et al. 1999). A positive screen for depression was defined as 4 or more with the severity score rated >0 , or a total summative score of ≥ 6 . Severe depression is defined as a total score of >15 . Internal consistency estimates obtained from the study sample were 0.79 and 0.81 at 2 weeks and 6 months postpartum, respectively. The State-Trait Anxiety Inventory is a 40-item self-report questionnaire asking participants about symptoms of worry, tension, and stress with a scale ranking the frequency of symptoms. A score of >100 is used to define a positive screen for state-trait anxiety. Internal consistency estimates obtained from the study sample were 0.96 and 0.71 at 2 weeks and 6 months, respectively. The Yale-Brown Obsessive-Compulsive Scale (YBOCS) and checklist measures the severity of OCS and consists of 37 obsessive symptoms and 21 compulsive symptoms. The self-report prompts the respondent to indicate which obsessions and compulsions she is currently experiencing. The participant is asked to rate the impact of these thoughts and actions on her life, which is used to generate a severity score. A score of 0 signifies no symptoms and a score of 4 represents severe symptoms for each item. The total score ranges from 0 to 40. A total symptom effect score of >7 was considered a positive screen for OCS. Scores of 1–7, 8–15, 16–23, 24–32, and 33–40 are considered subclinical, mild, moderate, severe, and severely extreme symptoms, respectively. Internal consistency estimates obtained from the study sample were 0.80 and 0.77 for obsessions scale at 2 weeks and 6 months, and 0.70 and 0.76 for compulsions at 2 weeks and 6 months, respectively.

Bivariable analysis of sociodemographics and prior psychiatric morbidity were compared between completers and non-completers to identify any differences present in order to describe our patient population. The completer sample was then dichotomized by the presence of a positive screen for depression. Total STAI, state anxiety, trait anxiety, YBOCS, obsessions, and compulsions scores were compared between the two groups (depressed, non-depressed) at both 2 weeks and 6 months postpartum. Finally, interactions between depression, state-trait anxiety and OCS were assessed using GLM repeated measures analyses.

Analyses were performed using Stata version 11.1 (Stata Corp., College Station, TX) and SPSS version 19 (SPSS Inc, Chicago, IL). All tests were two tailed and $p < 0.05$ was used to define statistical significance. The data were de-identified prior to analysis and so informed consent was waived by the Institutional Review Board of Northwestern University for this secondary analysis.

Results

During the study period, 461 women completed the 2 weeks postpartum follow-up and constituted the analyzable sample. Of these, 331 (72 %) completed the 6 month surveys. Table 1 demonstrates demographic and clinical characteristics of the sample. Compared to those who completed the 6 month surveys, those lost to follow-up were younger, more likely to be African-American or Latina, were less educated, and were less likely to be married. There were no differences in prior psychiatric history or exposure to family violence between the groups. The Little's MCAR test resulted in a $\chi^2=15.4$ ($p=0.56$), which indicates that missing data were absent completely at random.

At 2 weeks postpartum, 141 (30.5 %) screened positive for depression, 32 (6.9 %) screened positive for anxiety, and 51 (11.1 %) screened positive for OCS. At 6 months postpartum, 67 (20.2 %) screened positive for depression, 28 (8.5 %) screened positive for anxiety, and 35 (10.5 %) screened positive for OCS. Notably, a one-sample t test showed that participants who were depressed at 2 weeks remained depressed at the 6-month mark.

Participants were subdivided into those with and without depression. At 2 weeks postpartum, women with depression had significantly higher scores on the anxiety and OCD scales compared to women who screened negative for depression (Table 2). Twenty-eight (19.9 %) women with postpartum depression had comorbid anxiety symptoms, compared to 4 (1.3 %) of women who screened negative for depression ($p<0.001$). Similarly, women with depression were more likely to report OCS than women without depression [36 (25.7 %) vs 19 (8.4 %), ($p<0.001$)].

The association between OCS and depression persisted at the 6-month postpartum screen. Seventeen (16.7 %) women with depression and 18 (7.9 %) women without depression screened positive for OCS at 6 months postpartum ($p=0.017$). However, there were no differences in state-trait anxiety scores between those with and without postpartum depression at 6 months postpartum (Table 2). Nine (9.0 %) women who screened positive for depression screened positive on the STAI at 6 months postpartum, compared to 19 (8.4 %) who screened negative for depression ($p=0.860$).

When examining the impact of depression on the course of state-trait anxiety levels between 2 weeks and 6 months postpartum, repeated measures GLM analyses showed a significant interaction effect between group status (depressed, non-depressed) and anxiety scores which suggested that the course of anxiety over time differs between groups (Fig. 1a, $p<0.001$). Similarly, there was a significant interaction effect in the course of OCS (Fig. 1b, $p=0.011$). Women with depression had higher STAI scores at 2 weeks postpartum, which then decreased by 6 months; whereas women without depression had lower STAI scores at 2 weeks, which slightly increased—such that the two groups had similar anxiety scores at the 6-month inquiry. Conversely, women with depression had much higher OCS scores than women without depression at the 2-week time point; although OCS scores decreased by 6 months, they remained higher in the depressed group than non-depressed group.

Discussion and conclusions

This prospective cohort investigation demonstrated that women with depressive symptoms were significantly more likely to experience state-trait anxiety and OCS than their non-depressed counterparts at 2 weeks postpartum. This finding supports prior data from both the general and postpartum depression literature that describe a substantial comorbidity between diagnoses of depression and anxiety (Kessler et al. 1996; Austin et al. 2010; Wenzel et al. 2005).

By 6 months postpartum, women with postpartum depressive symptoms were more likely than those without postpartum depression to experience resolution of their anxiety as measured by the STAI. The interaction between postpartum depressive symptoms and anxiety suggests that women with postpartum depression are particularly vulnerable to anxiety symptoms (both state-trait and OCS) immediately postpartum. However, symptoms of state-trait anxiety dissipate over time and, by 6 months postpartum anxiety symptoms were not significantly different between women with postpartum depressive symptoms and those without. In contrast to state-trait anxiety, women who screened positive for postpartum depression were more likely to experience obsessive-compulsive symptoms that persisted over time. While these OCS slightly improved over time in women with depression compared to those without it, nearly one in every five women with postpartum depression were experiencing OCS at 6 months after delivery. Obsessions and compulsions, when present and comorbid with postpartum depression, are more likely to persist and yield symptoms disruptive to a woman's life. This finding has implications for treatment in that serotonergic medications are efficacious for both depression and OCS; however, the psychotherapeutic interventions differ (Abramowitz et al. 2010). OCS respond to intensive exposure-based cognitive behavioral therapy, and depression to interpersonal therapy, behavioral activation, and verbal cognitive techniques (Challacombe and Salkovskis 2011). The OCS often include thoughts of infant harm that impact the mother's ability to attach to and physically care for her infant (Hudak and Wisner 2012; Wisner et al. 1999).

An alternative explanation to our findings is that the height-ened stress of an expecting or new mother may precipitate anxiety, both in the form of state-trait anxiety and OCS. These may trigger new onset depressive symptoms. As each woman gains more confidence in her new role, the anxiety subsides and depressive symptoms concomitantly decrease.

To our knowledge, this is the largest prospective postpartum cohort in which depression, state-trait anxiety and OCS has been examined, which allowed us to dissect changes in symptoms over time in unprecedented ways. However, this study has limitations. First, measures of depression, state-trait anxiety, and OCS were all self-reported. While each of the scales used has been previously shown to be associated with clinical diagnosis, the lack of confirmation by a mental health professional limits our ability to confirm comorbid diagnoses (Kroenke et al. 2001; Meades and Ayers 2011; Rosenfeld et al. 1992). However, the association between morbidities and that trend over time is unlikely to be systematically affected by the use of a screening tool. A second limitation is that women were recruited during selected hours when staff were available. While this was a convenience sample, all

postpartum women were eligible to be approached by research staff, and thus bias was unlikely to be introduced.

Understanding the full scope of mental health symptoms is critical to the care of postpartum women, and this study provides new information about the influence of depression on the course of anxiety and OCS. This study joins a growing body of literature that support anxiety screening during pregnancy and postpartum periods (Prenoveau et al. 2013; Skouteris et al. 2009; Mauri et al. 2010). Given the potential adverse effects of untreated disease on both the mother and family, incorporating screening, interventions and outcome assessments for anxiety and OCS in the context of postpartum depression is recommended. This study provides key insights how postpartum depressive symptoms affects state-trait anxiety and obsessive-compulsive symptoms.

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Fig. 1.
Interaction between depression and anxiety over time

Table 1

Patient characteristics

	All (n=461)	6-month completers (n=331)	6-month non-completers (n=130)	p value
Age	32.6±4.9	33.0±4.6	31.5±5.4	0.003
Race/ethnicity				<0.001
White	344 (74.5 %)	265 (80.1 %)	79 (60.3 %)	
Black	33 (7.1 %)	14 (4.2 %)	19 (14.5 %)	
Latina	52 (11.3 %)	27 (8.2 %)	25 (19.1 %)	
Other	33 (7.1 %)	25 (7.6 %)	8 (6.1 %)	
Religion				0.303
Christian	295 (63.9 %)	210 (63.4 %)	85 (64.9 %)	
Jewish	38 (8.2 %)	29 (8.8 %)	9 (6.9 %)	
Other	54 (11.7 %)	34 (10.3 %)	20 (15.3 %)	
Non-affiliated	75 (16.2 %)	58 (17.5 %)	17 (13.0 %)	
Education				<0.001
Completed college	395 (85.5 %)	298 (90.0 %)	97 (74.1 %)	
Completed high school	61 (13.2 %)	31 (9.4 %)	30 (22.9 %)	
Did not complete high school	6 (1.3 %)	2 (0.6 %)	4 (3.1 %)	
Married	412 (89.2 %)	303 (91.5 %)	109 (83.2 %)	0.009
Prior psychiatric history				
Depression	53 (11.5 %)	41 (12.4 %)	12 (9.2 %)	0.327
Anxiety	28 (6.1 %)	21 (6.3 %)	7 (5.3 %)	0.684
OCD	2 (0.4 %)	2 (0.60 %)	0 (0.00 %)	0.373
Prior inpatient psychiatric treatment	10 (2.2 %)	7 (2.11 %)	3 (2.31 %)	0.898
History of family violence	38 (8.2 %)	28 (8.5 %)	10 (7.6 %)	0.771

p values represent comparisons between completers and non-completers

Table 2

Two week postpartum anxiety and OCS screen scores, dichotomized by depression

	2 weeks postpartum	Depression screen	Score	p	6 months postpartum	Depression screen	Score	p
STAI	Total score	negative	61.2± 14.5	<0.001	Total score	negative	68.4±20.5	0.215
		positive	84.3±20.5			positive	66.4±20.8	
	State anxiety	negative	30.5±8.2	<0.001	State anxiety	negative	46.0±4.7	0.008
		positive	43.1 ± 11.8			positive	44.4±4.9	
YBOCS	Trait anxiety	negative	30.8±7.5	<0.001	Trait anxiety	negative	32.6±9.1	<0.001
		positive	41.2± 10.7			positive	40.8±11.9	
	Total score	negative	1.3±2.9	<0.001	Total score	negative	1.7±3.3	<0.001
		positive	4.0±5.0			positive	3.3±4.5	
	Obsessions	negative	0.7±1.7	<0.001	Obsessions	negative	1.2±2.0	<0.001
		positive	2.0±3.2			positive	2.2±2.8	
	Compulsions	negative	0.5±1.4	0.019	Compulsions	negative	0.6±1.6	<0.001
		positive	1.1 ±2.4			positive	1.3±2.6	