Antecedent Trauma Exposure and Risk of Depression in the Perinatal Period

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ABSTRACT

Objective: To assess the impact of antecedent trauma on the risk of antenatal and postpartum depression in a prospective, longitudinal cohort of pregnant women.

Method: 374 participants (pregnant women aged 20–34 years) were recruited from a hospital-based obstetrics practice serving a predominantly low-income, inner-city population between May 2007 and May 2012. Clinical diagnostic interviews and psychosocial questionnaires were administered at 18 and 32 weeks of gestation and at 6 weeks and 6 months postpartum. Lifetime exposure to and details of traumatic events were recorded. Depression during pregnancy or the postpartum period was diagnosed according to *DSM-IV-TR*.

Results: 39% of the sample reported at least 1 traumatic event; trauma history (odds ratio [OR] = 2.16; 95% CI, 1.31–3.54) and, particularly, experiencing childhood sexual abuse (OR = 2.47; 95% CI, 1.27–4.78), someone close experiencing violence (OR = 2.19; 95% CI, 1.11–4.32), and the unexpected death or illness of someone close (OR = 2.15; 95% CI, 1.14–4.05) predicted antenatal but not postpartum depression. A clear dose-response effect of trauma on antenatal depression was observed; women who experienced 3 or more traumas had a 4-fold risk (OR = 4.34; 95% CI, 2.16–8.70) of antenatal depression compared to women with no trauma history.

Conclusions: Antecedent trauma significantly increases the risk of antenatal depression, but antenatal depression alone does not appear to predict postpartum depression. Routine screening for trauma exposure and depression is warranted during pregnancy to aid in the early detection and treatment of depression. Future studies need to examine mechanisms that may trigger affective episodes in trauma-exposed women, who may be especially vulnerable to depressive episodes during pregnancy.

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Exposure to a traumatic event is a well-established predictor of depression in women.[1–3] Although all trauma types convey risk, experiencing abuse during childhood and increased frequency of such exposures are particularly potent predictors of depression during adulthood.[2–4] The current study examines the link between trauma and depression during the perinatal period. Investigating links between trauma and depression in the perinatal period is needed given the frequency of trauma history and exposure in pregnant women, ranging from 29.3%–74.1%.[5–9] Moreover, if prior trauma does precipitate perinatal depression, then there would be major clinical implications given that depression in pregnancy predicts birth outcomes[10] and that postpartum depression is one of the more robust predictors of compromised child health and development.[11–13]

Several studies have reported an association between childhood abuse[5,14–17] and depressive symptoms during either pregnancy or the postpartum period, but existing research is limited by reliance on self-report measures and cross-sectional assessments during either pregnancy or the postpartum period; furthermore, few studies have considered trauma type, timing, or frequency. As a consequence, key questions about the effects of different types of trauma, multiple exposures, and whether there is a differential prediction from trauma to antenatal or postpartum depression remain unanswered. The current study was designed to address these limitations.

We examine the links between trauma history and depression throughout the perinatal period and consider the novel hypothesis that susceptibility to depression varies in the perinatal period. The hypothesis that the link between trauma exposure and depression vulnerability may be different in the pregnant and postpartum (and nonpregnant) state is based on several findings. First, trauma exposure is associated with persistent psychobiological changes that alter sensitivity to subsequent stressors.[2,3] In particular, trauma-exposed individuals show persistent dysregulation of stress responses including abnormal responses of the hypothalamic-pituitary-adrenal axis and the parasympathetic and sympathetic nervous systems,[3,18–21] as well as increased inflammation.[22] These biological systems, which have been linked with depression, undergo considerable alteration in the course of normal pregnancy. Specifically, there is a substantial increase in the stress hormone cortisol, particularly later in pregnancy,[23] and an apparent diminished responsiveness of the hypothalamic-pituitary-adrenal axis to acute stress[24,25]; furthermore, there are sizable and relatively rapid changes in inflammation and reproductive steroids across the perinatal period, characterized, for example, by a relatively rapid decline in estrogen and progesterone following parturition.[26] These biological changes may alter the mother's susceptibility to depression that may be linked with trauma exposure. No study has yet considered the possibility that trauma history has a differential link with depression across the perinatal period; we tested this exploratory hypothesis in a prospective longitudinal study. Second,

Clinical Points

- Women with antecedent trauma history appear especially vulnerable to depressive episodes during pregnancy.
- There was a clear dose-response effect of trauma on risk of antenatal depression, and trauma types conferred differential risk.
- Routine screening for trauma exposure and depressive symptoms is warranted in pregnant women to aid in the early detection and treatment of depression.

as part of routine obstetric care during pregnancy, there are repeated intrusive physical examinations, which may cause a reactivation of previous sexual trauma and/or increase the risk of depression[5,27] in those with a sexual trauma history.

In summary, this study examined the risk of depression in the perinatal period as a function of antecedent trauma exposure; we considered the role of trauma type, timing, and severity, and we differentiated antenatal from postnatal depression. On the basis of previous research, the following hypotheses were generated: (1) experiencing childhood sexual abuse and childhood emotional abuse or neglect would be associated with an increased risk of depression in the perinatal period, and (2) there would be a dose-response association between number of trauma exposures and risk for depression in the perinatal period; we also considered whether the prediction from trauma exposure to depression was comparable in the antenatal and postnatal periods.

METHOD

The data were derived from 2 related prospective, longitudinal cohort studies that used identical clinical protocols to obtain phenotypic data. The sample comprised pregnant women who were receiving obstetric care from a hospital-based practice serving a predominantly low-income, inner-city population, a setting particularly chosen because of the high rates of stress exposure and mental health needs. Data collection occurred between May 2007 and May 2012. Ethical approval was obtained from the university's institutional review board, and all participants provided written informed consent.

The inclusion criteria were as follows: women with a confirmed singleton pregnancy of less than 18 weeks' gestation, aged 20–34 years, considered low-to-medium obstetric risk by the medical team, fluent in English, and able to provide informed consent. The exclusion criteria were presenting for obstetric care at >18 weeks' gestation, current substance or alcohol abuse, past or current diagnosis of bipolar disorder or schizophrenia, or presence of psychotic features. Nursing staff in the clinic provided an overview of the study to all attendees who met inclusion criteria and asked if they were interested in finding out more about the study. Study team members met with 627 eligible women and performed a screening interview that included administration of the Edinburgh Postnatal Depression Scale[28] and Penn State Worry Questionnaire.[29] Of the 627 eligible women, 497 (79%) were subsequently enrolled and gave informed consent; there was oversampling for women who scored high on affective symptoms as measured by the Edinburgh Postnatal Depression Scale and Penn State Worry Questionnaire. A further 116 women were excluded from these analyses after completing the initial interview because they did not meet inclusion criteria, suffered a perinatal loss, changed obstetrics provider, or were lost to contact prior to the clinical interview assessment. A further 7 women were found to have experienced psychotic features or admitted to drug use and so were excluded. The final sample comprised 374 women, of whom 37 had given consent only for pregnancy-related assessments. Data for the latter are included in descriptive and inferential analyses using antenatal data, but they are not included in postpartum variables or predictions. These 37 women were not significantly different from the remaining sample on key sociodemographic or clinical data.

Participants were assessed twice during pregnancy: at approximately 18 weeks' (n = 374) and 32 weeks' (n = 361) gestation and twice in the postpartum period, at approximately 6–8 weeks (n = 305) and 6 months (n = 288). At each interview, participants completed a clinical diagnostic interview and a battery of health-related and psychosocial questionnaires. Detailed medical, clinical, and sociodemographic data were collected via interview and medical notes.

Definition of Trauma Exposure

Information on traumatic events was elicited through the posttraumatic stress disorder (PTSD) section of the Structured Clinical Interview for *DSM-IV-TR* (SCID)[30]; a description of each event that a woman had experienced and the age at which it occurred were recorded. We defined a traumatic event as meeting criterion A1 of the *DSM-IV* diagnostic criteria for PTSD (309.81). This criterion includes "exposure to an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate."[31(pp428–429)]

The individual traumas were subsequently grouped into 6 categories based on conceptual and empirical grounds: (1) experiencing the sudden or unexpected illness or death of someone close, (2) being involved in a motor vehicle accident or natural disaster, (3) experiencing parental neglect or physical or emotional abuse as a child, (4) being a victim of childhood sexual abuse, (5) being the victim of physical or sexual assault as an adult, and (6) having a family member or close friend who was the victim of physical or sexual assault either as a child or as an adult.

Clinical diagnoses of current depression and history of depressive episodes were made through the mood episodes section of the SCID.[30] The anxiety section of the SCID was completed to generate categorical diagnoses; generalized

Table 1. Sociodemographic and Clinical Characteristics Shown for Overall Sample and by Trauma Exposure Status

Characteristic	Overall Sample (N = 374)	Trauma-Exposed (n = 146)	Non–Trauma-Exposed (n = 228)	Difference Between Groups	
				Statistic	*P* Value
Age at interview, y				$t = -0.15$	> .88
Mean (SD)	24.5 (3.7)	24.4 (3.7)	24.5 (3.7)		
Range	19–34	19–34	20–34		
Ethnicity, n (%)				$\chi^2 = 0.04$	> .84
White	115 (30.7)	42 (28.8)	73 (32.0)		
Black/African American	182 (48.7)	72 (49.3)	110 (48.2)		
Biracial	20 (5.3)	13 (8.9)	7 (3.1)		
Hispanic/Latina	52 (13.9)	17 (11.6)	35 (15.4)		
Other	5 (1.3)	2 (1.4)	3 (1.3)		
Education				$t = -0.40$	> .69
Mean (SD), y	12.6 (2.0)	12.5 (2.2)	12.6 (1.9)		
Range, y	8–26	8–26	8–20		
Did not finish high school, n (%)	82 (21.9)	34 (23.3)	48 (21.1)		
Completed high school, n (%)	141 (37.7)	52 (35.6)	89 (39.0)		
Some college, n (%)	117 (31.3)	48 (32.9)	69 (30.3)		
Completed college, n (%)	34 (9.1)	12 (8.2)	22 (9.6)		
Marital status, n (%)				$\chi^2 = 0.72$	> .40
Single	205 (54.8)	84 (57.5)	121 (53.1)		
Cohabiting/married	169 (45.2)	62 (42.5)	107 (46.9)		
Primigravid, n (%)	105 (28.1)	33 (22.6)	72 (31.6)	$\chi^2 = 3.55$	> .06
BMI at 18 weeks' gestation (kg/m^2)				$t = -0.40$	> .69
Mean (SD)	28.3 (7.3)	28.1 (7.0)	28.4 (7.5)		
Range	13.0–51.6	16.6–51.6	13.0–51.5		
Underweight (< 18.5), n (%)	12 (3.2)	8 (5.5)	4 (1.8)		
Normal (18.5–24.9), n (%)	141 (37.7)	50 (34.2)	91 (39.9)		
Overweight (25.0–29.9), n (%)	87 (23.3)	35 (24.0)	52 (22.8)		
Obese (≥ 30), n (%)	134 (35.8)	53 (36.3)	81 (35.5)		
Receiving Medicaid, n (%)	262 (70.1)	109 (74.7)	153 (67.1)	$\chi^2 = 2.42$	> .12
Any perinatal depression, n (%)	107 (28.6)	53 (36.3)	54 (23.7)	$\chi^2 = 6.94$	< .008
Any anxiety disorder (excluding PTSD), n (%)	176 (47.1)	82 (56.2)	94 (41.2)	$\chi^2 = 7.97$	< .005

Abbreviations: BMI = body mass index, PTSD = posttraumatic stress disorder, SD = standard deviation.

anxiety disorder, specific and social phobias, obsessive-compulsive disorder, panic disorder, and PTSD were assessed and diagnosed according to *DSM-IV-TR* criteria.

Outcome Variables

For the purposes of this study, *depression* was defined as a diagnosis of major depressive disorder, minor depression, or depressive disorder not otherwise specified, according to *DSM-IV-TR* criteria. *Antenatal depression* refers to depression that occurred at either 18 or 32 weeks' gestation, or both, and *postpartum depression* refers to cases that occurred at either 6 weeks or 6 months postpartum, or both.

Data Analysis

Clinical and sociodemographic factors were compared between women with and without antecedent trauma exposure. Treating the 2 groups under comparison as independent, χ^2 analysis was used for categorical variables, and *t* tests and Mann-Whitney tests were conducted for continuous variables. Logistic regression with backward elimination was used to estimate the effects of variables on predicting the dichotomous outcome variables. Three separate logistic regression models were run to predict having antenatal or postpartum depression; analyses are also presented for meeting lifetime criteria for PTSD. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Age, parity, ethnicity, education, and marital status were included as covariates in all analyses due to their clinical and theoretical significance. In addition, the effect of antenatal depression was controlled for in predicting postpartum depression. On the basis of previous examples in the literature,[4,32,33] the number of trauma exposures was examined as both continuous variable and nominal variable, with 4 groups defined (0, 1, 2, and 3+ traumas). Multicollinearity was assessed using the variance inflation factor; all values were < 5, indicating no multicollinearity. Analyses were conducted with SPSS 18.0 (SPSS Inc; Chicago, Illinois).

RESULTS

The demographic and clinical characteristics of the overall sample and then of the sample divided by trauma exposure status are depicted in Table 1. The sample comprised predominantly young, single, nonwhite women, the majority of whom had a high school education, or less, and were receiving Medicaid.

Psychiatric Morbidity

Over half of the women (52.4%; 196 of 374) reported at least 1 episode of depression prior to the study. Of the total sample (N = 374), 283 women (75.6%) did not experience depression (antenatal or postpartum) during the study, 40 (10.7%) experienced antenatal depression only, 25 (6.7%) experienced postpartum depression only, and 26 (7.0%) experienced both antenatal and postpartum depression. Of the 51 women who experienced postpartum depression, 26 (51%) also had antenatal depression. Table 2 shows the

rates of depression at each time point for the entire sample. Ethnicity, education, and marital status were not associated with developing either antenatal or postpartum depression. A previous history of depression was associated with both antenatal depression (OR = 7.69; 95% CI, 3.99–14.79; $P < .001$) and postpartum depression (OR = 2.83; 95% CI, 1.46–5.49; $P < .01$). Experiencing antenatal depression significantly predicted a diagnosis of postpartum depression (OR = 5.68; 95% CI, 2.97–10.85; $P < .001$).

Rates of lifetime anxiety disorders were relatively high in the total sample (N = 374): 3.8% (n = 14) met criteria for obsessive-compulsive disorder, 12.3% (n = 46) met criteria for specific phobia, 3.5% (n = 13) met criteria for social phobia, and 17.1% (n = 64) had panic disorder (with or without agoraphobia). The rate of generalized anxiety disorder was 15.8% (n = 59), and the rate of generalized anxiety disorder not otherwise specified was 17.9% (n = 67). A total of 57 women (15.2%) met lifetime criteria for PTSD.

Table 2. Percentage of Women With a Depression Diagnosis at Each Time Point for the Entire Sample

Depression Diagnostic Category	18 Weeks' Gestation (N = 374), n (%)	32 Weeks' Gestation (n = 361), n (%)	6 Weeks Postpartum (n = 305), n (%)	6 Months Postpartum (n = 288), n (%)
Major depressive episode	32 (8.6)	24 (6.7)	13 (4.3)	19 (6.6)
Minor depression	22 (5.9)	8 (2.2)	9 (3.0)	6 (2.1)
Not otherwise specified	12 (3.2)	6 (1.6)	9 (3.0)	3 (1.0)
Any depression	66 (17.6)	38 (10.6)	31 (10.2)	27 (9.4)

Table 3. Frequency and Percentage of Trauma Categories by Overall Sample and by Trauma-Exposed Group Only

Trauma Category	n	% of Entire Sample (N = 374)	% of Trauma-Exposed Group (n = 146)
Unexpected or sudden illness or death of someone close	55	14.7	37.7
Motor vehicle accident or natural disaster	41	11.0	28.1
Parental neglect or childhood physical abuse	16	4.3	11.0
Childhood sexual abuse	45	12.0	30.8
Victim of physical or sexual assault as an adult	42	11.2	28.8
Family or close friend victim of physical or sexual assault	45	12.0	30.8

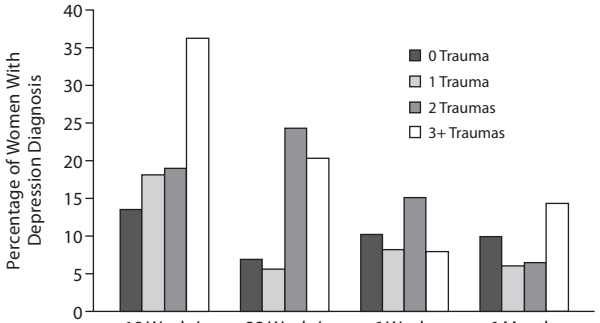
Trauma Exposure

Within the sample, 39.0% (146 of 374) reported experiencing at least 1 traumatic event. The median number of trauma exposures was 2 (range, 1–9 exposures), and the mean (SD) age at first trauma exposure was 14.6 (6.9) years (range, 1–30 years). The number of traumatic events that individuals experienced varied: 37.7% (n = 55) had 1 traumatic event, 32.2% (n = 47) had 2 traumatic events, and 30.1% (n = 44) had 3 or more traumatic events. Table 3 shows the frequency of each trauma category represented in the sample as a whole and then only within the trauma-exposed group.

The mean (SD) time since the first trauma was 9.8 (7.1) years (range, 0–29 years) and since the most recent trauma was 5.4 (6.0) years (range, 0–29 years). Thirty-two women (21.9%) experienced a traumatic event during the study period: 12 experienced the sudden death or illness of someone close, 6 were involved in a motor vehicle accident or natural disaster, 8 were the victim of physical violence (6 of the perpetrators were the current partner and 2 were family members), and the remaining 6 had a family member or close friend who was the victim of violence.

Sociodemographic factors including age, ethnicity, education, marital status, and receipt of Medicaid were not associated with a trauma history; women with antecedent trauma were significantly more likely to have a previous history of depression ($\chi^2_1 = 20.8$, $P < .001$; 67.1% vs 43.0%).

Figure 1. Percentage of Women Diagnosed With Depression at Each Time Point, Grouped by Number of Trauma Exposures



No. of traumas	%	%	%	%
0	13.6	6.9	10.3	9.9
1	18.2	5.7	8.3	6.1
2	19.1	24.4	15.2	6.5
3+	36.4	20.5	7.9	14.3

Trauma Exposure as a Risk Factor for Mood Disorders

Logistic regression analysis showed that trauma-exposed women had a higher risk of being diagnosed with any anxiety disorder (excluding PTSD) (OR = 1.83; 95% CI, 1.20–2.74; $P < .005$) and experiencing depression at *any* point during the perinatal period (OR = 1.84; 95% CI, 1.17–2.89; $P < .009$). Trauma exposure significantly predicted antenatal depression (OR = 2.16; 95% CI, 1.31–3.54; $P < .05$) but not postpartum depression (OR = 1.23; 95% CI, 0.67–2.25; $P > .51$). Having a lifetime diagnosis of PTSD predicted antenatal depression (OR = 3.25; 95% CI, 1.79–5.91; $P < .001$) but not postpartum depression (OR = 1.51; 95% CI, 0.71–3.18; $P > .28$). Time since the most recent trauma was not a significant predictor of PTSD (OR = 1.01; 95% CI, 0.95–1.07; $P > .81$), antenatal depression (OR = 0.97; 95% CI, 0.91–1.03; $P > .36$), or postpartum depression (OR = 0.99; 95% CI, 0.92–1.07; $P > .85$).

Figure 1 represents the percentage of women who were diagnosed with depression at each time point, grouped by the number of trauma exposures.

Table 4. Estimated Risk of Diagnosis of Antenatal and Postpartum Depression and Lifetime Diagnosis of Posttraumatic Stress Disorder (PTSD) by Trauma Type and Number of Traumas Experienced

Trauma Type	Antenatal Depression,[a] OR (95% CI)	*P*	Postpartum Depression,[b] OR (95% CI)	*P*	Lifetime Diagnosis of PTSD,[a] OR (95% CI)	*P*
Unexpected or sudden illness or death of someone close	2.15 (1.14–4.05)	.02	1.54 (0.65–3.61)	.33	5.45 (2.78–10.64)	.001
	1.83 (1.12–4.41)[c]	.02	0.91 (0.27–3.09)[c]	.88	6.65 (2.99–14.77)[c]	.001
Motor vehicle accident or natural disaster	1.56 (0.76–3.20)	.23	1.34 (0.49–3.67)	.57	2.47 (1.14–5.34)	.02
	1.70 (0.74–3.91)[c]	.21	1.52 (0.49–4.70)[c]	.47	3.32 (1.39–7.92)[c]	.007
Parental neglect or childhood physical abuse	1.20 (0.38–3.81)	.76	2.54 (0.75–8.64)	.14	12.16 (3.96–37.39)	.001
Childhood sexual abuse	2.47 (1.27–4.78)	.007	1.10 (0.44–2.79)	.84	9.21 (4.85–19.45)	.001
Victim of physical or sexual assault as an adult	1.58 (0.76–3.26)	.22	0.85 (0.32–2.29)	.75	9.56 (4.64–19.72)	.001
	0.98 (0.38–2.53)[c]	.97	0.94 (0.29–3.07)[c]	.92	9.90 (4.32–22.73)[c]	.001
Family or close friend victim of physical or sexual assault	2.19 (1.11–4.32)	.02	0.53 (0.18–1.53)	.24	4.92 (2.44–9.92)	.001
	2.40 (1.08–5.35)[c]	.03	0.21 (0.04–1.00)[c]	.05	6.92 (3.05–15.68)[c]	.001
Age at first trauma	1.02 (0.99–1.05)	.11	1.00 (0.96–1.04)	.99	1.11 (1.07–1.14)	.001
Number of traumas experienced (continuous)	1.32 (1.12–1.55)	.001	1.10 (0.91–1.34)	.32	2.31 (1.83–2.90)	.001
0 (reference category)						
1	1.03 (0.48–2.24)	.94	0.87 (0.34–2.24)	.77	Reference category	
2	2.19 (1.06–4.51)	.03	1.05 (0.39–2.87)	.92	2.02 (0.87–4.67)	.10
3+	4.34 (2.16–8.70)	.001	0.95 (0.37–2.48)	.92	2.16 (0.92–5.09)	.08

[a]Controlled for age, education, ethnicity, and marital status.
[b]Controlled for age, education, ethnicity, marital status, and experiencing antenatal depression.
[c]Women who experienced trauma during the study period were removed from the analyses.

A higher number of trauma exposures was associated with antenatal depression (OR = 1.31; 95% CI, 1.12–1.53; $P < .001$) and with a trend for postpartum depression (OR = 1.17; 95% CI, 0.98–1.40; $P < .07$). The finding with antenatal depression remained significant even after controlling for age at trauma onset (OR = 1.31; 95% CI, 1.10–1.57; $P < .01$).

Risk of Antenatal Depression, Postpartum Depression, and Lifetime Diagnosis of Posttraumatic Stress Disorder by Type of Trauma

Table 4 shows the ORs and 95% CIs for antenatal and postpartum depression and lifetime diagnosis of PTSD for each trauma category. Given that 32 women experienced a traumatic event during the study period, the data were reanalyzed removing those women; these results are denoted by footnote "c."

Supplemental analysis examined rates of trauma between the 4 diagnostic groups: women with antenatal depression *only* had higher rates of trauma exposure (52.5%) compared to women with postpartum depression *only* (36.0%), who did not differ from women without depression (36.4%); rates of trauma in women with antenatal depression *only* were nearly identical to those with both antenatal and postpartum depression (50.0%). Although the marginal distributions of trauma across the 4 groups were not significant overall ($\chi^2_3 = 5.3$, $P = .15$), the pattern reinforces the main logistic regression analyses that suggest that antenatal depression is more closely associated with trauma exposure than is postpartum depression.

DISCUSSION

To our knowledge, this is the first prospective study to examine the impact of antecedent trauma on the risk of clinically diagnosed antenatal and postpartum depression in a longitudinal design. The increased risk of morbidity in this low-income minority sample was observed in the overrepresentation of sociodemographic risk factors typically associated with depression and in the high rates of perinatal depression, anxiety disorders, and PTSD.

As in previous studies, rates of trauma were high[5,10–13]; 39% of women reported at least 1 traumatic event, and, of these, two-thirds had multiple traumas. One-third of the sample had experienced childhood sexual abuse or had been the victim of physical or sexual violence, although current rates of interpersonal violence were comparatively low.[27]

All types of antecedent trauma were associated with developing PTSD, but only 3 subtypes of trauma (childhood sexual abuse, unexpected death or illness, and someone close being assaulted) predicted antenatal depression in logistic regression analyses, and none predicted postpartum depression. Supplementary analyses showed that the rates of trauma were higher in women with antenatal depression only, compared to postpartum depression, supporting the notion that there is a differential effect of trauma on antenatal compared to postpartum depression. There was a clear dose-dependent effect of trauma on antenatal depression, similar to that reported in the Adverse Childhood Experiences study[4]; however, in contrast, the recency of the event in our study was not predictive. The results raise the important issue of why trauma exposure would confer risk of depression during pregnancy but not in the postpartum period—the key novel finding in this study. A possible explanation is that altered stress reactivity as a result of trauma exposure[3,18,22] mediates susceptibility to the triggering of depression in pregnancy due to the substantial, but normative, changes that occur in neuroendocrine and immune systems during pregnancy.[34,35]

The powerful impact of experiencing childhood sexual abuse on antenatal depression was evident[36]; it was one of the strongest predictors of antenatal depression, with more than a 2-fold risk of illness. A recent study[37] of the developmental trajectory of childhood sexual abuse victims showed a range

of adverse psychological and health outcomes. History of childhood sexual abuse may be particularly predictive of antenatal depression because of the repeated and intrusive physical examinations of routine obstetric care, which may reactivate trauma and induce depression in those with a history of sexual abuse.[5,27] This possibility warrants further and direct testing. Alternatively, or in addition, childhood sexual abuse may be closely linked with risk for antenatal depression if women anticipate concerns about providing a safe environment for the child (although this would not account for a lack of prediction of postpartum depression). Although previous studies have shown that childhood physical or sexual abuse predicts depression[38] in the perinatal period,[5–9] we found an effect only for childhood sexual abuse. This finding may be due to the relatively low frequency of nonsexual childhood abuse reported.

In contrast to previous studies,[5,6] we did not find an association between trauma and postpartum depression; methodological differences may account for this finding. Previous studies had smaller samples, relied on self-report measures of depression and trauma exposure, and did not also consider antenatal depression. These studies also had high rates of concurrent interpersonal violence that strongly predicted postpartum depression. Furthermore, we excluded women who abused alcohol or drugs or who failed to receive early prenatal care, factors that may contribute to postpartum depression. Although the timing of our assessments may have failed to detect postpartum depression cases with onset between 6 and 12 weeks, 16.5% of women had postpartum depression within 6 months; this percentage is significantly higher than the 6.5%–12.9% reported for the first year postpartum.[39] Our results show that trauma is a strong predictor of antenatal depression and that antenatal depression is a strong predictor of postpartum depression; by implication, trauma may initiate a depressive vulnerability in the antenatal period that, for some women, also carries over into the postnatal period.

The results of the study have several clinical implications. The need to screen women for depressive symptoms during pregnancy is clear; presently, screening is focused on the early postpartum period despite the fact that antenatal depression is more prevalent and is linked with adverse maternal and obstetric outcomes. Screening can be incorporated into routine obstetric visits, and early detection allows for treatment intervention that may mitigate adverse postpartum outcomes. Health care providers should also screen for trauma exposure (and the type) along with other known risk factors[40] to identify women at increased risk of perinatal depression. Given the potential adverse effects of maternal depression on fetuses,[41] screening for a history of trauma (and particularly childhood sexual trauma) may lead to improvements in routine obstetric care and, through effective psychological or psychiatric treatment, may improve pregnancy and obstetric outcomes.

There are also treatment implications; research has shown that a history of childhood trauma affects depression treatment response.[42–44] Identification of a trauma history and using a compatible treatment may improve depression outcomes for this treatment-refractory trauma group. To this end, there are encouraging results from intervention studies[9,44] developed for low-income minority mothers at higher risk of trauma and depression. Findings show that, compared to various control groups, the pregnant women who received the interventions had reduced depression rates during pregnancy and the postpartum period.[9,44]

The study had several limitations; as with all trauma studies, we relied on self-report, which may result in bias. Pregnant women with substance use issues and those late to prenatal care were excluded, but future research is clearly needed in this vulnerable group. However, there were notable strengths, including a large low-income minority population, the use of diagnostic interviews, a longitudinal design, and detailing each trauma type and its recency to pregnancy.

Trauma exposure significantly increases the risk of antenatal depression, but trauma exposure alone does not appear to predict postpartum depression. Routine antenatal screening of depression and trauma history is warranted to identify women at risk and to aid in the early detection and treatment of depression. Future studies are needed to examine mechanisms that trigger affective episodes in trauma-exposed women, who appear biologically and psychologically vulnerable to depressive episodes during pregnancy.

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