Research Briefs

Maternal–Infant interaction in women with unipoloar and bipolar depression

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ABSTRACT

Background: One percent of women experience bipolar disorder and are likely to suffer from mood disorders during the postpartum period, potentially impacting interaction with their infants.
The purpose of this study was to describe maternal–infant interactions in women with bipolar depression at 12 months postpartum and to compare interactions to women with unipolar depression and a control group.
Methods: Using a descriptive design, maternal–infant interactions in women with bipolar disorder (n = 40) were videotaped, coded, and analyzed for maternal sensitivity and maternal–infant reciprocity and compared to maternal–infant interaction in women with unipolar depression (n = 50) and women without depression (n = 40).
Results: Women with bipolar depression had lower scores on both maternal sensitivity and infant reciprocity, but differences were nonsignificant.
Conclusions: This research is the first study to examine maternal–infant interaction in women with bipolar disorder, and important trends were noted. Future research should examine maternal–infant interaction at earlier time periods.

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Approximately 1% of women experience bipolar disorder, an illness characterized by recurrent episodes of depression, hypomania and mania (Merikangas et al., 2007). Although not as common as unipolar depression, women with bipolar depression suffer from significant role impairment and disability (Sharma & Pope, 2012). They are also likely to suffer from mood episodes during the postpartum period (Yonkers, Vigod, & Ross, 2011; Viguera et al., 2011) which impacts their ability to interact with their infants (Moreno et al., 2012) and can have long-term adverse effects on their child (Hirshfeld-Becker et al., 2006). However, observation of maternal–infant interaction has not been previously reported. It would be helpful to characterize impairment in maternal–infant interaction in women with bipolar disorder so that effective interventions could be developed. The purpose of this study was to compare three groups, women with bipolar depression, unipolar depression, and a control group, on maternal–infant interactions at 12 months postpartum. This time period was chosen because patterns of interactions have been established and the maternal role is developed by 12 months (Mercer, 1986).

1. Methods

1.1. Design

The study was an ex post facto, three-group design. Women with a diagnosis of bipolar disorder (n = 40) were enrolled in the Antimanic Use during Pregnancy study (R01 MH 075921; K. Wisner, PI) and compared to women with a unipolar major depressive disorder (n = 50) who were enrolled in the antidepressant use during pregnancy (R01 MH60335; K. Wisner, PI). The comparison group (N = 40) consisted of women without a major mood disorder who were enrolled as controls in both studies. Depression was diagnosed by research study psychiatrists using the Structured Interview Guide for the Hamilton Scale

for Depression with Atypical Depression Supplement (Williams & Terman, 2003).

1.2. Sample

The women in all three groups were 18–44 years of age and English-speaking. Women with a diagnosis of DSM-IV bipolar disorder of any subtype were approximately 26 years of age, 67% were Caucasian, 43% had completed some college, and 60% were single. Compared to the comparison group and the women diagnosed with unipolar depression, women with bipolar depression were younger, more ethnically diverse, had less education, and fewer were married ($p = 0.03$–0.001).

1.3. Instruments

Four observational instruments were used to measure maternal–infant interaction. 1). Ainsworth Maternal Sensitivity Scale (AMSS) is based on observation of maternal behaviors as indicators of the mother's ability to perceive and interpret her baby's signals, and to respond to these signals in a prompt and appropriate manner. After observing a maternal–infant interaction, an observer codes a numerical rating for overall maternal sensitivity, based on the 9 point scale. The rating should be anywhere from 1 (highly insensitive) to 9 (highly sensitive) (Ainsworth, 1969). Miljkovitch et al. (2013) reported an inter-class coefficient for the AMSS of .91. 2). Maternal Behavior Q-Sort (MBQS) measures observation of maternal sensitivity with regard to accessibility, responsiveness and promptness to the child's needs. The maternal sensitivity score is calculated by comparing the descriptive sort and the criterion sort (prototypical sensitive mother) (Moran, Pederson, & Tarabulsy, 2011). Over a period of 20 years, Moran and colleagues have established extensive reliability and validity of the MBQS (Moran, Pederson, and Bento (2009). 3). The Dyadic Mini Code (DMC) is based upon observation of synchrony between mother and child. Six items include measures of mutual attention, positive affect, mutual turn taking, maternal pauses, infant clarity of cues, and maternal responsiveness. Each item is given a score with the total score indicating high or low synchrony. Inter-rater reliability, concurrent validity, and evidence of construct validity have been reported (Censullo, Bowler, Lester, & Brazelton, 1987). 4). Child-Caregiver Mutual Regulation Scale (CCMR) is based upon the Mutual Regulation Model (Tronick & Weinberg, 1997), another method of measuring observation of synchrony. The CCMR codes four dimensions of maternal and infant behavior: child affect, child behavior, maternal affect, and maternal behavior. The authors have not published reliability and validity data for this specific tool but have done so for similar instruments (Tronick, Als, Adamson, et al., 1978).

1.4. Procedures

Women were recruited on or before 20 weeks gestation and followed through pregnancy and after birth. Recruitment was by self-referral, physician and community health center referral, and/or advertising. Approval was obtained from the university institutional review board. All women provided written informed consent.

Women in the three groups of the study brought their babies to the laboratory at the university when the women were 12 months postpartum in order for the researchers to observe and videotape maternal–infant interaction. The videotapes were created in an observation room with standard procedures developed by Tronick et al. (1978). That is, mothers and infants were seated facing each other with the infant placed in a table top infant seat so that eye to eye contact was facilitated. Two video cameras recorded the faces of both the mother and the baby and the baby's entire body.

Noldus software was used for data entry and analysis. The Noldus Observer XT is a software package for the collection, analysis, and presentation of observational data. Four research assistants separately coded 3 minute videotapes of maternal–infant interaction that were recorded at 12 month postpartum. Each research assistant had expertise and extensive training in one of four approaches to coding (AMSS, DMC, MBQS, and CCMR), and our research team had previously conducted pilot studies of the procedures (e.g., Logsdon, 2008). Inter-rater reliabilities for each coding method ranged from .7 to .9; researchers who were experienced in each coding method provided training to individual research assistants and served as the partner for reliability ratings. The research assistants were masked to depression and treatment status of mothers.

1.5. Data analysis

Descriptive statistics for the sample were calculated as means and standard deviations for continuous measures, frequencies and proportions for categorical measures. Tests of association between diagnosis and demographic/clinical measures included ANOVA for normally distributed measures, the non-parametric Kruskal–Wallis for non-normally distributed measures, and chi-square for categorical measures. A Bonferroni correction was employed for post-hoc group comparisons. Mothers were compared on each of the maternal/infant interaction observation scales in two stages: first, by regressing scale scores on diagnosis alone; and second, by regressing scale scores on diagnosis adjusting for potential confounders. A measure was assumed to be a potential confounder if it was associated with both diagnosis and the interaction scale. Logistic models were estimated for the AMSS and DMC (ordinal and binary respectively) while a linear model was estimated for the CCMRS. Due to the extremely non-normal distribution of the MBQS, a Friedman's two-way nonparametric ANOVA was estimated.

2. Results

In terms of maternal–infant interaction, women with bipolar disorder had lower scores on the AMSS, DMC and MBQS than women without depression or women with unipolar depression in the sample; however, none of the differences were significant. See Table 1. The CCMR scores of women with bipolar depression (57.4) were closer to women without depression (57.2) and different from women with unipolar depression (52.5) in the sample, even though these differences were not significant. Measures of both maternal sensitivity (AMSS, MBQS) and maternal–infant synchrony (DMC) were lower in women with bipolar depression compared to the other two groups, and CCMR scores in women with bipolar depression were closer to women without depression.

3. Discussion

It is widely known that maternal–infant interaction is impaired in women with unipolar depression, but this study is the first to describe

Table 1
Mother–Infant interaction measures by diagnosis.

| Measure | Diagnosis | | | |
	None (N = 40)	Unipolar (N = 50)	Bipolar (N = 30)	p
AMSS	7.2 ± 1.6	7.3 ± 1.7	6.1 ± 2.5	0.0738
DMC: High synchrony	14 (38.9)	19 (38.8)	13 (54.2)	0.4109
CCMRS: Facilitative actions	57.2 ± 19.1	52.5 ± 18.6	57.4 ± 24.0	0.4416
MBQS	0.37 ± 0.57	0.22 ± 0.65	0.09 ± 0.69	0.1930

Abbreviations: AMSS Ainsworth Maternal Sensitivity Scales; CCMRS Child-Caregiver Mutual Regulation Scale; DMC Dyadic Mini Code; MBQS Maternal Behavior Q-Sort.
In all models, the referent category for diagnosis is 'none'.
AMSS adjusted for mother's age; no variables were associated with both diagnosis and DMC: High synchrony; CCMRS: Facilitative actions adjusted for race; MBQS adjusted for race and marital status.

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