Published in final edited form as:

Infant Behav Dev. 2008 April ; 31(2): 190–193.

Prenatal Dysthymia versus Major Depression Effects on the Neonate

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Abstract

Depressed pregnant women were classified as dysthymic or major depression disorder based on the Structured Clinical Inventory for Depression and followed to the newborn period. The newborns of dysthymic versus major depression disorder mothers had a significantly shorter gestational age, a lower birthweight, shorter birth length and less optimal obstetric complications scores. The neonates of dysthymic mothers also had lower orientation and motor scores and more depressive symptoms on the Brazelton Neonatal Behavioral Assessment Scale. These findings were not surprising given the elevated cortisol levels and the inferior fetal measures including lower fetal weight, fetal length, femur length and abdominal circumference noted in our earlier study on fetuses of dysthymic pregnant women

In two large meta-analyses on the prevalence of prenatal depression, the range was reported at 6.5 to 12.9% in one meta-analysis (Gavin, Gaynes, Lohr, Meltzer-Brody, Gartlehner, & Swinson, 2005) and at 7.4%, 12.8% and 12% for the first, second and third trimester, respectively in a second meta-analysis (Bennett, Einarson, Taddio, Koren, & Einarson, 2004). Very few studies have identified major depression and dysthymia with depressed individuals (Yang & Dunner, 2001), and those that have, present conflicting findings with more symptoms noted for major depression in some studies (Klonsky & Bertelson, 2000), in contrast to more symptoms noted for dysthymia in others (Yang & Dunner, 2001), and even similar symptoms for both conditions (Flament, Cohen, Choquet, Jeammet & Ledoux, 2001).

In a recent study on prenatal depression, we compared women with dysthymia and major depression during pregnancy (Field, Diego, Hernandez-Reif, Figueiredo, Ascencio et al., 2007). The major depression group had more self-reported symptoms on the Center for Epidemiological Studies Depression Scale, on the State Anxiety Inventory, on the State Anger Inventory, on the Daily Hassles Scale and on the Behavior Inhibition Scale. However, the dysthymic group had higher prenatal cortisol levels and lower fetal growth measures (estimated weight, femur length and abdominal circumference) as measured at the first ultrasound (M=22 weeks gestational age). Thus, the two types of depressed pregnant women appeared to have different prenatal symptoms with differential effects on their fetuses. In the present study, on a different sample, we assessed neonatal outcomes and performance on the Brazelton Neonatal Behavioral Assessment Scale for the newborns of dysthymic and MDD mothers.

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Method

Participants

The participants were 72 depressed mothers (N=33 with dysthymia, N=39 with major depression) and their infants (M age= 24.2 hours, N=38 females). The mothers averaged 1.2 parity, 28.4 years of age, and 11.8 years of education. Their socioeconomic status was low to middle ($M=4.3$ on the Hollingshead Index), and they were distributed 51% Hispanic, 28% African American and 21% non-Hispanic white. The two groups did not differ on these demographic variables.

Procedure

Two-hundred pregnant women had been recruited at a University Hospital prenatal clinic during their first ultrasound visit ($M=20$ weeks gestation, $R=17-22$ weeks). Following informed consent, the 200 pregnant women were administered the Structured Clinical Interview for Depression (SCID) by trained research associates who were supervised by a clinical psychologist. Seventy-two of the women recruited were diagnosed with dysthymia (N=33) or major depression (N=39) based on the SCID. The mothers were called on the phone an average of four times over the remaining 5 months of pregnancy in an attempt to reduce potential attrition. The women were paid to call us after delivering their newborns to schedule their assessments.

Self-report Measures

Structured Clinical Interview for DSM-IV Diagnoses (SCID)—(American Psychiatric Association, 2000). All women in the study were given the SCID-I (Non-patient edition: research version) to determine depression and anxiety diagnoses and to screen out other disorders including bipolar disorder, schizophrenia and other psychotic disorders. Spanish-only speaking women were administered the Spanish version of the SCID (Ascaso, Garcia, Navarro, Aguado, Ojuel, & Tarragona, 2003). None of the women were on antidepressants and none were receiving therapy. In our experience (including a recent survey sample), the majority (95%) of the depressed pregnant women who attend the university ultrasound clinic are not taking anti-depressants and are not in therapy. Anxiety was also assessed because of its noted comorbidity with depression and its noted effects on pregnancy (Glover, Teixeira, Gitau & Fisk, 1999), although no anxiety diagnoses were made in this sample.

Neonatal Measures

Birth measures—The gestational age of each newborn was estimated by the Dubowitz Scale (Dubowitz, Dubowitz & Goldberg, 1970). This estimate is based on the assessment of neuromuscular and physical maturity. Other birth measures included birthweight, birth length and head circumference.

Obstetric and postnatal complications—were assessed by the Obstetric and Postnatal Complications Scales (Littman & Parmelee, 1978). The Obstetric Complications Scale (OCS) records 41 events related to the mother's health, pregnancy and delivery complications, infant's gestational age, birth, and postnatal events, as well as additional treatment events. The OCS yields a single converted numerical score. The Postnatal Complications scale (PCS) includes 10 events and also yields a converted score. Higher scores are optimal. These data were retrieved from the women's medical records.

Brazelton Neonatal Behavior Assessment Scale—The Brazelton Neonatal Behavior Assessment Scale (BNBAS) (Brazelton, 1983) was given midway between feedings. The scale is comprised of 20 neurological reflex items and 27 other items summarized according to 7

factors: habituation, orientation, motor behavior, range of state, state regulation, autonomic stability and abnormal reflexes. In addition, excitability and depressive behaviors were recorded. The Brazelton examiners were unaware of the infant's group assignment and were trained to a .90 reliability criterion prior to the study. This assessment was included because lower orientation and motor scores, and more depressive behaviors were noted on the Brazelton scale in our earlier studies on newborns of depressed mothers (Abrams, Field, Scafidi & Prodromidis, 1995; Lundy, Jones, Field, Nearing, Davalos, Pietro, Schanberg & Kuhn, 1999).

Results

Multivariate analyses of variance (MANOVAs) were conducted on the birth measures and the Brazelton Neonatal Behavioral Assessment Scale scores. Following significant MANOVAs, univariate ANOVAs were conducted with group assignment (dysthymia/major depression) being the between groups measure.

Birth Measures

As can be seen in table 1, the dysthymia group had; 1) lower birth measures including lower gestational age, lower birthweight and lower birth length; and 2) more obstetric complications and postnatal complications.

Brazelton Neonatal Behavioral Assessment Scale

As can be seen in table 2, the dysthymia group had 1) lower orientation scores; 2) lower motor scores; and 3) more depressive symptoms, as suggested by higher depression scores.

Discussion

In an earlier study, dysthymia was contrasted with major depression during pregnancy (Field et al., 2007). The results suggested that the dysthymic group had significantly higher prenatal cortisol levels, which may have explained the lower fetal weight, the lesser femur length and the lesser abdominal circumference noted in the fetuses during the ultrasound examinations. In earlier studies we conducted, elevated cortisol had been associated with lower birthweight (Field, Diego, Dieter, Hernandez-Reif, Schanberg, Kuhn, Yando, Bendell, 2004; Field, Diego, Hernandez-Reif, Gil, & Vera, 2005). Unfortunately cortisol was not assayed in this sample. Nonetheless, the lower fetal growth measures in our earlier study on dysthymia and major depression (Field et al., 2007) and the lower birth measures in the current study appeared to be a consistent profile that may be linked to disturbed neuroendocrine and neurotransmitter functioning in dysthymic depression (Griffiths, Ravindran, Merali & Anisman, 2000; Klonsky & Bertelson, 2000).

Neurobiochemical imbalances may contribute to intrauterine growth deprivation via reduced intrauterine artery blood flow that has been reported, for example, by Glover et al. (1999). This would be expected to result in fetal growth delays and ultimately in lower birthweight. Elevated cortisol has been a significant predictor of shorter gestational age in at least two of our studies (Field et al., 2004; 2005). These data suggest that prenatal dysthymia may be a greater risk factor than major depression for fetal development and neonatal outcome. However, this result may be confounded by other factors including chronicity of depression which is typically greater in those with dysthymia and comorbidity of depression and anxiety symptoms which were not measured in self-report scales in this study. The degree to which the inferior outcomes for the dysthymia group are related to factors such as chronicity of depression, comorbidity of depression and anxiety and a prenatal hormonal imbalance needs to be further investigated (Flament et al., 2001; Griffiths et al., 2000).

Acknowledgements

We would like to thank the mothers and infants who participated in these studies. This research was supported by a Merit Award (MH # 46586), Senior Research Scientist Awards (MH# 00331 and AT# 001585) an NIH grant (#AT00370) and a March of Dimes Grant (# 12-FYO3-48) to Tiffany Field and funding from Johnson & Johnson Pediatric Institute to the Touch Research Institutes.

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Table 1

Dysthymia and Major Depression Effects on Birth Measures (Standard deviations in parentheses).

Measures	Dysthymia	MDD	F	P
Gestational Age	36.2 (4.9)	38.3 (2.4)	4.49	0.05
Birthweight	2732.0 (106.0)	3204.1 (886)	4.13	0.05
Birth Length	47.0 (6.2)	50.0 (2.4)	5.71	0.02
Head Circumference	32.1 (3.9)	33.8 (1.6)		NS
Obstetric Complications *	95.0 (27.1)	109.2 (17.8)	5.32	0.02
Postnatal Complications *	124.8 (34.2)	142.0 (32.2)	4.11	0.05

* Higher scores are optimal

Table 2

Dysthymia and Major Depression Effects on Brazelton Neonatal Behavior Assessment Scale Clusters (Standard deviations in parentheses).

Clusters	Dysthymia	MDD	F	P
Habituation	5.4 (2.1)	6.0 (2.0)		NS
Orientation	4.2 (2.1)	5.6 (1.7)	6.11	0.02
Motor	4.0 (0.9)	5.0 (0.8)	4.72	0.05
Range of State	4.0 (0.9)	4.0 (1.0)		NS
State Regulation	4.8 (1.5)	5.1 (1.1)		NS
Autonomic Stability	5.9 (1.1)	5.8 (1.4)		NS
Reflexes	1.5 (1.5)	1.4 (1.4)		NS
Excitability	2.3 (1.9)	1.8 (1.6)		NS
Depression	3.8 (2.8)	2.4 (1.9)	5.19	0.04