Weight Gain in Breastfed Infants of Mothers Taking Antidepressant Medications

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Background: Little is known about the physical development of infants who are exposed to antidepressant medications through breast milk.

Method: Seventy-eight breastfeeding women taking antidepressant medications were included in the study. Maternal mood was prospectively evaluated at 6, 12, and 18 months postpartum. Infants' weights were obtained from review of pediatric records. Data were gathered from 1997 to 2002.

Results: Infants' weights were not significantly different from weights of 6-month-old breastfed infants from normative populations. However, infants of mothers who relapsed to relatively long-lasting major depressive episodes (lasting 2 months or more) following delivery weighed significantly ($p = .002$) less when compared with infants of mothers who relapsed to brief depressive episodes (< 2 months) and infants of mothers who did not relapse to depression in the postpartum period. This finding remained after including medication dosage and infant birth weight as covariates.

Conclusion: Exposure to antidepressant medications through breast milk does not appear to affect infants' weight. However, infants exposed to maternal depression lasting 2 months or more appear to experience significantly lower weight gain than infants of euthymic mothers or mothers who experience brief (< 2 months) major depressive episodes. Maternal depression following delivery may influence behaviors that, over the course of 2 months or more, affect infants' weight gain.

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A number of studies have evaluated the safety of antidepressant medications when taken by nursing mothers. Many reports have evaluated whether the medication exposure was associated with adverse effects in the infant, such as changes in sleep or feeding.[1–4] Some studies have additionally obtained measurements of medication concentrations in serum and/or breast milk,[1–4] and a handful of studies have evaluated children's developmental outcomes following exposure to antidepressants through breast milk.[5,6] Most findings have been reassuring, showing no evidence of adverse effects in the majority of reported cases.

However, little is known about the physical development of children whose mothers breast-feed while taking antidepressant medications. Only 1 study has addressed this question to date.[7] That study, which compared 26 nursing infants whose mothers took fluoxetine with 38 nursing infants of unmedicated mothers, reported significantly lower weight gain among the fluoxetine-exposed infants over the first 6 months of age.[7] The mothers in both groups had taken fluoxetine during pregnancy and were similar across demographic factors. However, compared with the mothers who discontinued fluoxetine after delivery, the mothers who remained on fluoxetine treatment while nursing may have been more chronically ill or, in contrast, may have been less depressed as a result of taking the antidepressant. The study did not evaluate the relationship between maternal mood in the postpartum period and infants' weight gain.

Furthermore, a case series of fluoxetine use by 14 nursing mothers reported poor feeding in 2 of the infants, but did not specify the infants' weight gain.[2]

All antidepressants enter breast milk, and therefore nursing infants will be exposed to them. Changes in appetite and weight are potential side effects of these medications.[8] To further explore the impact of antidepressant exposure on nursing children's growth, we examined 6-month weights of infants whose mothers took antidepressant medications while breast-feeding and present the results below. The infants' weights were compared with those from normative age-matched populations of breastfed infants.[9,10] The impact of maternal depression on infant weight gain was also examined.

METHOD

Seventy-eight breastfeeding mother-infant pairs were included in the study. The women had been treated in the postpartum period with an antidepressant medication for a mood or anxiety disorder, gave birth to full-term infants, had no substance or alcohol use disorders, and were nonsmokers. Women initiated antidepressants either during pregnancy or within 4 weeks postpartum.

The women had presented to the Pregnancy and Postpartum Mood Disorders Program at UCLA for consultation regarding the treatment of depression or anxiety disorders during pregnancy and/or the postpartum period. They provided written informed consent allowing study investigators to obtain prospective clinical assessments of mood at 6, 12, and 18 months postpartum using a DSM-IV checklist for symptoms of major depressive disorder. Written informed consent was also obtained for release of obstetric and pediatric records. Obstetric and pediatric records were reviewed for information on infants' gestational age, birth weight, Apgar scores, medication exposure during pregnancy and breastfeeding, postnatal weight gain, and postnatal health complications, if any. Data were gathered from 1997 to 2002.

Statistical Analysis

Two-tailed t tests were used to compare the 6-month-old infants' mean weights with weights obtained from normative population samples.[9] T tests, analysis of variance (ANOVA), and analysis of covariance (ANCOVA) were used to compare weights of infants whose mothers remained euthymic, weights of infants whose mothers relapsed to depression, and normative weights of 6-month-old breastfed infants. Covariates for ANCOVA analyses consisted of maternal medication dosage (standardized within each group) and infant birth weight.

RESULTS

The women who participated in the study were taking an antidepressant (citalopram, fluoxetine, fluvoxamine, paroxetine, sertraline, or venlafaxine) once daily for treatment of major depressive disorder. Fifty-six women (72%) had been taking the medications during pregnancy. Six women were taking additional psychotropic agents (benzodiazepines, tricyclic antidepressants). Twenty-six women (33%) experienced a major depressive episode in the 6 months following delivery. In 11 cases, this depressive episode lasted 2 months or longer. The women exclusively breast-fed their infants in the 4 months following delivery and continued breast-feeding for a minimum of 50% of the infants' feedings during the fifth and sixth postpartum months. Sample characteristics are shown in Table 1.

Table 1. Maternal and Infant Characteristics of 78 Breastfeeding Mother-Infant Pairs[a]

Characteristic	Value
Maternal	
Age, y	33.3 (4.5)
Daily dose of medication, mg	
Citalopram (N = 3)	15 (7.1)
Fluoxetine (N = 29)	34.6 (15.0)
Fluvoxamine (N = 3)	116.7 (28.9)
Paroxetine (N = 15)	20.4 (4.3)
Sertraline (N = 25)	82.4 (52.1)
Venlafaxine (N = 3)	162.5 (120.6)
Infant	
Gestational age, wk	39.1 (1.3)
Birth weight, kg	3.4 (0.4)
Admitted to SCN, N (%)	3 (3.8)
Gender, male/female, N	42/36

[a]All values shown as mean (SD) unless otherwise noted.
Abbreviation: SCN = special care nursery.

Infants' mean ± SD 6-month weights were 7.26 ± 0.71 kg (16.13 ± 1.58 lb) for girls and 7.93 ± 0.75 kg (17.62 ± 1.67 lb) for boys. These weights were not significantly different from normative weights of 6-month-old breastfed infants (7.30 ± 0.88 kg [16.22 ± 1.96 lb] for girls and 8.09 ± 0.88 kg [17.98 ± 1.96 lb] for boys)[9] (t = –0.26, p = .79 for girls; t = –1.20, p = .24 for boys) when examined for the group as a whole or separately for each medication (data not shown). Furthermore, the mean 6-month weights were virtually identical to the recently published growth data from the Centers for Disease Control and Prevention for 6-month-old girls and boys (7.2 kg [16.0 lb] and 7.9 kg [17.6 lb], respectively).[10] The mean 6-month weight gains for the nursing infants exposed to fluoxetine, paroxetine, and sertraline were 4.3 ± 0.8 kg (9.6 ± 1.7 lb), 4.2 ± 0.6 kg (9.3 ± 1.2 lb), and 4.3 ± 0.7 kg (9.6 ± 1.6 lb), respectively.

Further, infants' mean weights were not different when compared among infants of euthymic mothers, infants of mothers who relapsed to depression, and normative populations of breastfed infants (F = 2.7, df = 1,73; p = .1). This finding remained after infant birth weight was included as a covariate.

However, infants of mothers who, following delivery, relapsed to relatively long-lasting major depressive episodes (lasting 2 months or more) (N = 11) weighed significantly less when compared with infants of mothers who relapsed to brief depressive episodes (< 2 months) (N = 15) (t = 3.54, p = .002), or infants of mothers who did not relapse to depression in the postpartum period (N = 52) (t = 3.22, p = .002). ANOVA analysis comparing infants of mothers who had relatively long-lasting depressive episodes with infants of mothers who relapsed to brief depressive episodes and with infants of mothers who did not relapse to depression in the postpartum period similarly found a significant difference in weight gain (F = 6.63, df = 2,73; p = .002). This finding remained after including medication dosage and infant birth weight as covariates (F = 9.06, df = 1,71; p = .004).

DISCUSSION

This study examined postnatal weight gain in 6-month-old infants whose mothers took selective serotonin reuptake inhibitor or serotonin-norepinephrine reuptake inhibitor antidepressants while nursing and found that these infants' weights were comparable to weights of breastfed infants from normative populations.[9,10] This finding remained when data were examined separately for fluoxetine, a medication that has previously been linked to diminished weight gain and poor feeding in nursing infants.[2,7]

A limitation of this study was the absence of a control group of children not exposed to antidepressant medications through breast milk. However, infant weight gain in U.S. populations has been well normed from nationally representative samples of children.[9,10]

A notable finding was that 6-month-old infants of mothers who experienced major depressive disorder lasting 2 months or more weighed significantly less than infants of mothers who remained euthymic or who experienced brief (< 2 months) major depressive episodes. This finding remained after controlling for maternal medication dosage and infant birth weight. A limitation of this study was the lack of information about severity of maternal depression.

Maternal depression may lead to behaviors that subsequently influence children's weight gain. Supporting this theory, a study of infants and toddlers whose weights were less than the third percentile found that maternal self-report of depression was one of 3 factors distinguishing the underweight children from their normal-weight peers.[11] The 2 other factors were low socioeconomic status and low birth weight. The study did not elucidate the specific mechanisms mediating the relationship between maternal depression and infant weight gain.

One possibility is that maternal depression may influence mothers' feeding behaviors. Indeed, maternal depression at 7 weeks postpartum appears to predict a reduced preference for breastfeeding.[12] Additionally, variables that may underlie maternal depression, e.g., family conflict or financial stress, may also influence infants' weight gain. Further, maternal depression may influence biological variables in milk, such as cortisol levels, which in turn may affect infants' weight gain. To our knowledge, only 1 study has examined the relationship between maternal mood and breast milk composition. That study, which examined new mothers' scores on the Profile of Mood States, reported a positive correlation between levels of secretory immunoglobulin A in breast milk and maternal anger and vigor in the first postpartum week.[13]

It was striking that several women in our study experienced relatively lengthy depressive episodes despite treatment with antidepressant medications. This finding, however, is consistent with our previous report that depressive episodes in the postpartum period tend to respond relatively slowly to pharmacotherapy.[14]

To our knowledge, our study is the first to compare the impact of maternal depression and use of antidepressants on nursing infants' weight gain. This study adds to the extensive literature on the adverse impact of maternal depression on children's outcomes and underscores the importance of screening and treating depressive episodes occurring in new mothers. It further suggests that maternal depression may have a greater impact on infant growth than antidepressant exposure through breast milk.

Drug names: citalopram (Celexa), fluoxetine (Prozac and others), fluvoxamine (Luvox and others), paroxetine (Paxil), sertraline (Zoloft), venlafaxine (Effexor).

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