

Postpartum Depression, Infant Feeding Practices, and Infant Weight Gain at Six Months of Age

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ABSTRACT

Introduction: This study examined postpartum depression (PPD) as a potential risk factor for non-adherence to infant feeding guidelines and subsequent infant weight gain.

Methods: Participants were mother-infant dyads from the Infant Feeding Practices Study II ($N = 1447$). Main study variables were PPD, breastfeeding intensity, addition of cereal to infant formula, and age of introduction to solid foods.

Results: In logistic models adjusted for sociodemographic factors, mothers with PPD were 1.57 times (95% confidence interval [CI]: 1.16, 2.13) more likely to breastfeed at low intensity and 1.77 times (95% CI: 1.16, 2.68) more likely to add cereal to infant formula. Although PPD was associated with the early introduction to solid foods (odds ratio: 1.42; 95% CI: 1.07, 1.89), this relationship was not significant after

adjusting for potential confounders. A small but significantly greater average weight gain at 6 months was observed among infants of mothers with PPD (10.15 lb, $SD = 2.32$ vs. 9.85 lb, $SD = 2.32$).

Discussion: Screening for PPD at well-child visits may lead to improved maternal health outcomes and the prevention of early life risk factors for childhood obesity. *J Pediatr Health Care.* (2014) 28, 43-50.

KEY WORDS

Postpartum depression, infant feeding, infant weight, child obesity

Approximately 10% of U.S. infants and toddlers have a $\geq$ 95th percentile weight-for-recumbent length (Ogden, Carroll, Kit, & Flegal, 2012). This prevalence rate is a significant public health issue because excess weight gain during infancy has been associated with higher body mass index, higher skin fold thickness, and increased odds of obesity at age 3 years (Taveras et al., 2009). In a recent meta-analysis that included 10 cohort studies and more than 47,000 children from six countries, it was found that greater infant weight gain in the first year of life was consistently associated with risk for later obesity after adjusting for

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Conflicts of interest: None to report.

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sex, age, and birth weight (Druet et al., 2011). This observed pattern for increased weight gain fits the Life Course Health Development model perspective that risk factors which begin during critical and sensitive periods of child development, including early infancy, may have an interactive and cumulative effect over time that leads to long-term poor health outcomes (Halfon & Hochstein, 2002; Halfon, Russ, & Regalado, 2005). To interrupt the trajectory toward lifelong excess weight gain and the concomitant risks for chronic illness, greater focus is needed on the predictors of childhood obesity that begin in early infancy. The *Early Childhood Obesity Prevention Policies* of the Institute of Medicine (IOM, 2011) has affirmed the recommendations of the American Academy of Pediatrics (AAP, 2005) for infant feeding that include exclusive breastfeeding for the first 6 months of life and continued breastfeeding in conjunction with solid foods for 1 year or more. Research is needed that advances our understanding of factors that influence adherence to these recommended infant feeding practices.

Toward that end, the present study examined adherence to infant feeding guidelines within the context of postpartum depression (PPD), a disorder that affects between 12% and 20% of mothers in the United States during their first few months after delivery (Brett, 2008). Previous research has found that mothers who experience PPD are more likely to discontinue breastfeeding in the first few months after giving birth (Dennis & McQueen, 2009; McLearn, Minkovitz, Strobino, Marks, & Hou, 2006; Taveras et al., 2003). PPD also has been associated with forceful, indulgent, and restrictive infant feeding styles (Hurley, Black, Papas & Caufield, 2008). To our knowledge no previous studies have examined adherence to infant feeding practice recommendations and subsequent infant weight gain within the context of PPD. Understanding these relationships may inform the future design of clinical interventions to reduce the risk of childhood obesity and related lifelong health consequences.

The purpose of this study was to examine the effects of PPD on early infant feeding practices, including breastfeeding intensity at 2 months of age, adding baby cereal to formula at 2 months of age, and early introduction of solid foods (before 4 months of age). We also explored the contribution of sociodemographic, health, and behavioral factors on these infant feeding behaviors and examined the relationship between infant feeding practices and weight gain by 6 months of age for mothers with and without PPD.

METHODS

Sample

The Infant Feeding Practices Study II (IFPS II; www.cdc.gov/ifps), which is the source of data for the current study, was conducted by the U.S. Food and Drug Ad-

ministration and the Centers for Disease Control and Prevention. IFPS II data were collected longitudinally between May 2005 and June 2007, using a survey format with one prenatal and 10 postnatal mailings. Questionnaires were mailed to mothers approximately monthly, and mothers were asked to provide information on their infant feeding practices during the first year of the child's life. The sample of IFPS II was based on a nationally distributed consumer opinion panel, and the study included the following population inclusion criteria: mothers were at least 18 years of age; infants were born after 35 weeks gestation, weighed at least 5 lb, were a singleton birth, and did not require hospitalization for more than 3 days after birth; and neither the mother nor the infant could have a medical condition that would affect feeding behavior (Fein et al., 2008). The IFPS II included 4902 mother-infant dyads. For the present study, inclusion criteria specified no missing data for the main study variables. Infant weight at 6 months was available for 1902 babies. From this total, cases with missing data in areas that were required to calculate the three infant feeding practice variables (i.e., breastfeeding intensity at 2 months, adding baby cereal in formula at 2 months, and age of introduction of solid foods) or PPD also were excluded, further reducing the sample size to 1447. The present study was approved by the Institutional Review Board at George Mason University.

MEASUREMENTS

Main Exposure

PPD was measured using the 10-item Edinburgh Postnatal Depression Scale (EDPS) that was incorporated into the IFPS II 2-month postpartum survey. Each item of the EDPS describes a depressive symptom. Mothers rated the extent to which the symptom matched their feelings during the past several days. Possible scores range from 0 to 30, with higher scores signifying greater severity. The original authors of the EDPS recommended a cut-off score of ≥ 10 to screen for minor depression in primary care settings (Cox, Holden, & Sagovsky, 1987). Recent studies have used this cut-off score to identify depression during the postnatal period with community-based populations (Hansua, Scholle, Haskett, Spadaro, & Wisner, 2008; Hiscock & Wake, 2001; Mayberry, Horowitz & Declercq, 2007). Previous research has associated maternal symptoms of depression with early cessation of breastfeeding and nonresponsive infant feeding styles (Dennis & McQueen, 2009; Fergusson, Jamieson, & Lindsay, 2002; Hurley et al., 2008).

Outcome Measures

Infant feeding practices and infant weight gain by 6 months of age were the outcome variables for the present study. The three feeding practices assessed were breastfeeding intensity at 2 months, adding cereal to

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