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Social Emotional Factors Increase Risk of Postpartum Depression in Mothers of Preterm Infants

Katheleen Hawes, PhD, RN[1,2,3], Elisabeth McGowan, MD[1,2], Melissa O'Donnell, MSW[1], Richard Tucker, BA[1,2], and Betty Vohr, MD[1,2]

Objective To examine the association of maternal mental health, perceptions of readiness at neonatal intensive care unit (NICU) discharge, and social risk factors with depressive symptoms 1 month postdischarge in mothers of early (<32 weeks), moderate (32-33 weeks), and late (34-36 weeks) preterm infants. A secondary objective was to compare depressive symptoms among mothers in all preterm groups.

Study design Mothers (n = 734) of preterm infants cared for >5 days in the NICU and participating in a Transition Home Program completed the Fragile Infant Parent Readiness Evaluation prior to discharge for perceptions of NICU staff support, infant well-being, maternal well-being (emotional readiness/competency), and maternal comfort (worry about infant). Mental health history and social risk factors were obtained. At 1 month postdischarge the Edinburgh Postnatal Depression Scale was administered. Group comparisons and logistic regression analyses were run to predict possible depression (Edinburgh Postnatal Depression Scale ≥10).

Results Mothers of early, moderate, and late preterm infants reported similar rates of possible depression (20%, 22%, and 18%, respectively) 1 month after NICU discharge. History of mental health disorder, decreased perception of maternal well-being, decreased maternal comfort regarding infant, and decreased perception of family cohesion were associated with possible depression at 1 month postdischarge.

Conclusions Mothers with a previous mental health disorder and experiencing negative perceptions of self and infant at NICU discharge were at increased risk for depressive symptomatology 1 month postdischarge regardless of infant gestational age. Comprehensive mental health assessment prior to discharge is essential to identify women at risk and provide appropriate referral. *(J Pediatr 2016;179:61-7).*

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Postpartum depression (PPD), the most common complication of childbirth, affects up to 15% of all women within the first 3 months after delivery.[1,2] Mothers of infants born prematurely have almost double PPD rates (28%-40%), particularly in the early postpartum period in the neonatal intensive care unit (NICU).[3] It is known that maternal and infant relationships may be adversely affected by a women's depressive state.[4] Preterm infants are a vulnerable population with increased risk of adverse medical, developmental, and behavioral outcomes.[5-9] Therefore, preterm infants of depressed mothers are at increased risk for developmental problems because of both their prematurity and their mother's mental health status.[10]

The etiology of PPD in mothers of preterm infants appears to be multifactorial with biological, psychological, and social emotional elements.[11] PPD vulnerability has been associated with previous mental health disorders (MHDs), the unique stress of the premature birth, and NICU course.[3,12-14] Attainment of the maternal role, which is disrupted during the NICU hospitalization, requires perceived competence and readiness to care for one's newborn infant.[15] In mothers of full term infants, parenting competence was found to be related to PPD.[16] The impact of the factors of maternal competence and readiness on PPD risk are less well understood among mothers of preterm infants.[11] Understanding the contribution of maternal readiness and competence to PPD in mothers of preterm infants will aid in assessing, discharge planning, and referral for at-risk mothers.

DCYF	Department of Children, Youth and Families
EPDS	Edinburgh Postnatal Depression Scale
EPT	Early preterm
FIPRE	Fragile Infant Parent Readiness Evaluation
LPT	Late preterm
MHDs	Mental health disorders
MPT	Moderate preterm
NICU	Neonatal intensive care unit
PPD	Postpartum depression
THP	Transition Home Program

From the [1]Women and Infants Hospital of Rhode Island, Providence, RI; [2]Alpert School of Medicine, Brown University, Providence, RI; and [3]College of Nursing, University of Rhode Island, Kingston, RI

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The purpose of this study was to examine maternal mental health, perceptions of readiness at NICU discharge, and social risk factors with depressive symptoms 1 month postdischarge in mothers of early (EPT <32 weeks), moderate (MPT 32-33 weeks), and late (LPT 34-36 weeks) preterm infants. The primary hypothesis was that history of a MHD, and decreased maternal perception of emotional readiness and competency regarding self and infant at NICU discharge are associated with 1-month postdischarge depressive symptoms. A secondary hypothesis was that mothers in all preterm groups would experience similar levels of PPD symptomatology.

Methods

Subjects were part of a larger parent support and education intervention study: Partnering with Parents, the Medical Home and Community Providers to Improve Transition Services for High-Risk Preterm Infants in Rhode Island (Transition Home Program [THP]). All preterm infants <37 weeks gestation who were Rhode Island residents and hospitalized in a NICU for >5 days were eligible for enrollment. All infants are cared for in single family rooms that support high parental involvement in the care of the infants. Parents are encouraged to attend daily multidisciplinary rounds, provide basic infant care of diapering, bathing, feeding, skin to skin, and breast-feeding, as is developmentally and medically appropriate for their infant.

Families in the THP received additional support including educational handouts with information on infection control, infant safety topics, and community resources. Former NICU parents served as trained family resource specialists to review the written materials, administer study surveys, and provide support in the NICU. Mothers were approached for enrollment once the infants were stable and approaching discharge. Exclusionary criteria included not being able to read English or Spanish, infant or mother with terminal diagnosis, and infant not in parental custody. Hospital institutional review board approval and informed consent by parents was obtained prior to study enrollment. Data collection began in October 2012 and was completed April 2015.

Maternal and infant factors were chosen prospectively and abstracted from the electronic medical record. Maternal data (social risk factors) included age, race/ethnicity, gravida, marital status, education, Medicaid insurance, involvement with child protective services (Department of Children, Youth and Families [DCYF]), domestic violence, and substance abuse. Clinical social workers determined mental health history (*Diagnostic and Statistical Manual of Mental Disorders, 5th Edition*[17] approved diagnoses including depression, anxiety, bipolar depression, post-traumatic stress disorder, obsessive compulsive disorder, and mental health treatment [eg, psychotherapy and/or medication]) at enrollment by interview into the study and chart review. Infant data from the medical record included birth weight, gestational age, sex, intraventricular hemorrhage grade 3-4, cystic periventricular leukomalacia, necrotizing enterocolitis, sepsis, bronchopulmonary dysplasia, breast milk at discharge, oxygen at discharge, and length of stay.

Within 1 week prior to NICU discharge, mothers completed the Fragile Infant Parent Readiness Evaluation[18] (FIPRE) survey, which was developed by HealthActCHQ as a quality measure of NICU parent outcomes.[19] It consists of 4 multi-item scales that measure maternal perceptions of NICU staff support, infant well-being, maternal well-being, and maternal comfort. Infant well-being is maternal worry about infant's current status and survival. Maternal well-being represents her feelings of emotional readiness and competency. Maternal comfort is the degree of worry or concern the mother is experiencing regarding her infant's current and future health and development. Mothers were asked to respond to a series of statements and indicate how much each one reflected their experience on a 4-point scale from "not at all" to "a lot." The FIPRE includes 2 global items: "anticipated limitations in personal time" with the same response choices as the above items and "family cohesion" with response choices ranging from excellent to poor on a 5-point scale. The highest score possible is 100. Higher scores are more favorable and indicate greater discharge readiness. The mean and median scores are reported. Scores <75 were evaluated for each scale to indicate the percent of mothers reporting lower levels of NICU support, infant well-being, maternal well-being, and comfort levels regarding infant status. The average infant age at the time of the completion of the FIPRE was 36.2 ± 2.3 weeks gestation.

Maternal depression risk was measured with the Edinburgh Postnatal Depression Scale (EPDS),[20] which was administered at 1 month postdischarge by clinical social workers and trained research staff in-person at the infant's 1-month follow-up visit, or during a home visit, or by phone. The average time of screening was at 10.2 ± 6 weeks postpartum. This was an appropriate time for screening as postpartum blues resolve by 2 weeks and PPD is defined as beginning by 4 weeks and lasting up to 1 year.[17] The EPDS is a self-administered 10-item scale with sensitivity (86%) and specificity (78%).[20] Factor analyses of the EPDS indicate a 3-factor structure of anhedonia (items 1-2), anxiety (items 3-6), and depression (items 7-10).[21,22] The responses describe how the woman has been feeling in the past week. The maximum score is 30; a score of ≥10 indicates possible depression of varying severity. Clinical cut-off score of ≥13 indicates probable depression.[23,24] Women who responded to item 10, which speaks to suicidal ideation, were referred for immediate assessment and mental health services.

Maternal characteristics and outcomes were compared for mothers with EPDS scores ≥10 vs <10 by *t* tests and Wilcoxon tests for continuous variables and χ^2 for categorical variables. Infant variables were analyzed using random-effects models (continuous) or generalized estimating equations (categorical) methods to adjust for multiple births within mothers. Regression models were run to predict clinically suspect depression (EPDS score ≥10) at 1 month postdischarge. Independent variables were maternal social risk factors, FIPRE scores, and mental health history. Internal reliability for FIPRE scores from Cronbach α range from 0.72 to 0.88. Analyses were conducted with SAS v 9.1 (SAS Institute, Cary, North Carolina).

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