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Delivering Perinatal Psychiatric Services in the Neonatal Intensive Care Unit

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Abstract

Aim—To describe characteristics of mothers who would likely benefit from on-site short-term psychiatric services while their infant is in the Neonatal Intensive Care Unit (NICU).

Methods—For 150 consecutive mothers who were referred for psychiatric evaluation and psychotherapeutic intervention in an innovative NICU mental health program, baseline information was collected. Data regarding their referrals, diagnosis, treatments, and their infants was analyzed.

Results—Most mothers were referred because of depression (43%), anxiety (44%), and/ or difficulty coping with their infant's medical problems and hospitalization (60%). Mothers of VLBW infants were disproportionately more likely to be referred. A majority of mothers accepted the referral and were treated; most only required short-term psychotherapy. A minority resisted or refused psychiatric assessment; a quarter of these had more difficult interactions with staff or inappropriate behaviors. In these cases the role of the psychiatrist was to work with staff to promote healthy interactions and to foster maternal-infant bonding.

Conclusion—Overall, on-site psychiatric services have been accepted by a majority of referred NICU mothers, and most did not require long-term treatment. A considerable need exists for psychiatric services in the NICU to promote optimal parenting and interactions.

Keywords

depression; neonatal morbidity; anxiety; coping skills

Introduction

Though even mothers of healthy neonates are vulnerable to postpartum depression and anxiety, the birth of a critically ill newborn represents a stressor and crisis for many families.

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(1) Images of perfection are shattered; worries about death and loss may be prominent. Anxiety or depressive symptoms in turn may affect bonding between parents and their infant. Timely recognition and treatment of symptoms is critical. It has been recommended that pediatricians screen for postpartum depression (PPD) and utilize referral services. (2,3) However, when an infant is in the NICU, competing demands (including the needs of parents' other children, relationships, employment, travel, and housing if they are not local) further complicate the experience. Additional barriers to obtaining psychiatric care may include insurance issues, waiting list times, stigma, lack of self-focus to recognize the importance of their own mental health, and the concrete issue that mental health services are often in a different location. Because of the perceived need for mental health services for both NICU parents and staff, Rainbow Babies and Children's Hospital's Neonatal Intensive Care Unit (NICU) engaged the part-time services of a perinatal consultation-liaison psychiatrist, since 2005. The goals were to provide on-site supportive psychotherapy for referred parents, and educational and support sessions with NICU staff. (4)

The aim of this exploratory study was to describe the characteristics of mothers with infants in the NICU, who were referred for psychiatric evaluation and intervention. Based on clinical experience, we expected to find a population of parents with coping difficulties, depression or anxiety, who may not require subsequent psychiatric referrals, but who rather were suffering short-term mental health symptoms. The service was expected to be accepted by mothers as the aforementioned barriers to care would be decreased.

Patients and Methods

Program Protocol

Goals of our NICU psychiatry program include the evaluation and psychotherapeutic treatment of parental mental health concerns and distress related to, or exacerbated by, their neonate's medical problems and NICU hospitalization, and provision of staff education and support regarding psychological and psychiatric issues (4). The NICU psychiatrist evaluates parents and where appropriate provides short-term supportive psychotherapy with an interpersonal psychotherapy bent. If psychopharmacological intervention is deemed necessary, the psychiatrist liaises with the obstetrician or internist. (4) (For a full description of this program please see Ref 4.)

NICU social workers evaluate virtually all mothers of hospitalized neonates, and coordinate referrals to the psychiatrist of mothers who they perceive could benefit from psychiatric consultation while in the NICU. Nursing and physician staff also may approach social workers with suggested referrals for psychiatric consultation. In our NICU, social workers, nurses and physicians have participated in monthly psychiatric educational sessions over years, and are therefore relatively well attuned to warning signs of mental illness, which may be discovered in specific assessments or based on day-to-day interactions, depending on the staff. Mothers assessed as having chronic severe mental illness (e.g. schizophrenia or bipolar disorder) or active substance dependence are instead referred to other appropriate services for the necessitated in-depth long-term treatment, rather than the supportive therapy provided by this program.

Research Methods

After Institutional Review Board approval, we prospectively recorded data regarding infant characteristics, parent characteristics, and mental health issues for the population of mothers referred for psychiatric treatment in this innovative NICU program. Data collected regarding infant characteristics included: Gestational age, Birth weight, Sex, Multiplicity, Reason for NICU admission, Neonatal demise, Length of stay, Race, and Ethnicity. Data collected regarding parents included: Age, Marital status, Gravida, Para, Medical Problems, Education, and Occupation. Referral reason, whether the referral was accepted by the parent, Psychiatric history, Psychiatric diagnosis, Number of sessions, and Referrals for follow up treatment after infant discharge were also documented, by record review. Study data were collected and managed using REDCap electronic data capture tools hosted at Case Western Reserve University. (5) Data were analyzed using SPSS (6). Descriptive statistics were primarily used. The t-test analyzed differences for continuous variables and the chi-square was used for categorical variables. When appropriate, the Mann Whitney test was used for significance of medians.

Population

Rainbow Babies and Children's Hospital NICU (and NICU step-down unit) has 82 beds and admits approximately 1200 neonates annually. Approximately 150 (13%) have birth weights below 1.5kg (VLBW). We reviewed a two year period of 150 consecutive referrals to the NICU psychiatrist, which included approximately 6% of the mothers of admitted infants.

Results

Infant characteristics

Mean gestational age was 31.7 weeks, with a range from 22 weeks to full-term. (Table 1) Over two-thirds (71%) were premature (<36 weeks gestation) with a subset (31%) being born before 28 weeks gestation. A large minority had malformations (29%). Almost half (47%) of the infants were under 1.5kg at birth, making VLBW more common in this sample of mothers than our general NICU rate of 13%.

Infant gender was evenly distributed. There were 17 multiple births in the sample (11%) including five with a twin who died. Median length of stay was 51 days (range 3-384 days). While 37% of the infants of the referred mothers were hospitalized for less than a month, 33% were hospitalized more than 3 months.

Maternal Characteristics

Mean maternal age was 27 years (range, 15 to 41). (Table 2) Mothers were most frequently single (57%) though a large minority were married (41%). Often the father of the baby was not known to be involved (30%). Mothers had a wide range of educational achievement from below high school (11%) to having completed college or postgraduate work (36%). The majority (55%) were employed, mostly full time. Another group were students (9%). Most mothers had a prior pregnancy; their NICU infant was the product of the first pregnancy for only 28% of the mothers. Most (58%) of the mothers had other children at home. Multiple mothers had experienced a past loss.

Almost a third (32%) of referred mothers experienced prior mental health issues, including 17% with psychiatric concerns during their pregnancy. Another 14% of referred mothers had a history of substance abuse problems. Several (4%) of mothers had cognitive impairments. Many (43%; 61) of mothers were known to some community agency prior to their referral to psychiatric evaluation. Over a third of the mothers (35%) had a personal medical problem, ranging from asthma to cancer. Only a few, 5% experienced infertility.

Psychiatric Issues

Reason for Referral—Many mothers experienced difficulty coping with their infant's often unanticipated medically ill status (60%). (Table 3). Social workers and nursing staff also noted signs of depression (43%), anxiety (44%), and less commonly psychosis or grieving. Relationship issues (19%) and external (non-NICU) stressors (16%) also precipitated referrals. Most (135 of 150) were receiving concurrent counseling; all of these were seeing a social worker, 19% were seeing a pastor, and 7% were engaged in additional mental health treatment. At least 12 (8%) of the mothers were taking psychotropic medications while their infant was in the NICU.

Psychiatric Diagnoses—Maternal psychiatric diagnoses based on psychiatric diagnostic interviews included: depression (40%), anxiety disorders (31%), and PTSD (5%). Additional cases of adjustment disorder, bereavement, and several cases each of personality disorders, substance use disorders, psychosis, and postpartum psychosis, were treated or recommendations made for further care such as hospitalization.

Treatment utilization—Almost three-quarters (73%) of the mothers told the social worker that they “accepted” the referral to psychiatry. More than half of the mothers (56%) were assessed and treated with supportive psychotherapy. Mothers who participated in psychotherapy had between one and fifteen sessions, with a median of two sessions and a mean of three sessions. Four fathers participated in couple psychotherapy.

Though they reported that they “accepted” the referral, some mothers demurred when they met the psychiatrist (7%), and another group of mothers (7%) told the social worker that they were interested in psychotherapy yet were consistently unavailable when the psychiatrist came to the NICU, despite the psychiatrists’ flexibility. One-quarter (25%; 17) of those who did not participate exhibited behaviors which caused noteworthy staff distress or had challenging interactions with staff, such as inappropriate or manipulative or threatening behaviours. In these cases, strategies for dealing with challenging parents were discussed with the treatment teams. Presentations given to staff included topics such as bereavement, personality disorders, identification of depression, postpartum anxiety, post-traumatic stress disorder (PTSD), substance abuse, Munchausen's syndrome proxy, and identification of postpartum psychosis, based on these simultaneous issues among NICU parents.

We sought to characterize which mothers were most likely to follow through with seeing the NICU psychiatrist after being referred. Mothers with a longer NICU length of stay were more likely to see the psychiatrist. (median seen 70.5 days vs. not seen 30 days; $p=0.022$) Maternal age was significantly lower in those who saw the psychiatrist (26 vs. 28, $p=0.013$);

and mothers who saw the psychiatrist had fewer living children (median 1 vs. 2; $p=0.011$). Mothers who were not married were more likely to see the psychiatrist ($p=0.025$), as were those with less education. ($p=0.036$) Women in the Seen and Not Seen groups had no significant differences in their mental health history, involvement of the father-of-baby, their infant's gestational age, birth weight, multiplicity, infant expiration, or race. Inclusion of multiple predictors in a logistic regression model revealed that NICU length of stay and number of living children accounted for independent variance in predicting treatment uptake.

After infant discharge or infant demise, referrals for further psychotherapy or psychopharmacology visits were made when there was a need for ongoing care. One-third (33%) of the mothers seen were referred for subsequent psychiatric services. Some (12%) were additionally contacted after discharge via phone for follow-up.

Discussion

This descriptive study reported characteristics of 150 consecutive mothers referred for supportive psychiatric treatment in the NICU. Concerns primarily included coping difficulties, depression, and anxiety. Referred mothers were more likely to have a VLBW infant than the general NICU population. The majority of the mothers (56%) attended on-site psychiatric visits. Mothers whose infants had longer NICU hospitalizations, and mothers who were less educated, unmarried, younger, or with fewer living children were more likely to see the psychiatrist. Though the NICU hospitalization and parenting an ill baby increase stress, most mothers who were evaluated only required short-term therapy. Problematic personality traits, postpartum psychosis, or other serious mental illnesses were also diagnosed and treatment recommendations made to their treatment team, for more effective interventions with these populations. [See (1) for more detailed discussion of recommendations for NICU providers.]

Postpartum Depression and Anxiety

Approximately 15% of postpartum women experience postpartum depression (PPD) (7), though it is often undiagnosed and left untreated. The rate of PPD in the NICU has an elevated range from 28-70% (8). A recent review found rates of 40% among women with premature infants, associated with earlier gestational age, lower birth weight, ongoing infant disability and perception of a lack of social support (9). NICU-specific risk factors for depression may include parental perception of the severity of the infant's illness, greater parental stress, mothering multiples, and greater perception of disruption in parental role. (8,10) Poorer family functioning, less social support, and lower perceived control are associated with high levels of depression, anxiety, and hostility among NICU parents. (11). PPD has been correlated with bonding difficulties and abnormal attachment (7), negative infant breastfeeding outcomes (12), inappropriate excessive medical care, child maltreatment, and dysfunction in the family as well as unfavorable effects on brain development. (2)

Anxiety in the NICU has not yet been as well characterized as PPD. In a Turkish study (13), mothers who had an infant in the NICU experienced moderate anxiety. A New Zealand

study (14) compared parents of NICU infants with those of full-term healthy infants. While most parents adapted successfully, a higher percentage of NICU parents had clinically relevant anxiety. Women with pre-existing anxiety disorders often experience postpartum exacerbations. (1) Panic disorder and Obsessive compulsive disorder (OCD) may have exacerbations in the postpartum. In postpartum OCD, women may experience obsessional or aggressive thinking about their infant, fears of SIDS, fears for infant safety, fears of criticism, and infant-centered anxiety—which may cause them to decrease contact with their baby. (15)

In our sample of referred NICU mothers, depression and anxiety were the most common diagnoses made. While PPD has been recognized by the lay and medical community, referred mothers were also burdened by anxiety, which could similarly impair their interactions and bonding with their infants. We speculate that without this program, many cases would have been missed.

Obtaining Mental Health Programming for Mothers

In the current study, a disproportionately high percentage of mothers of VLBW infants were referred for mental health services in the NICU. An earlier study at our institution (16) found that, at both one month and two years, mothers of VLBW infants have more psychological distress than mothers of term infants. By age three years, mothers continued to report greater parenting stress. Authors concluded that programs including psychological screening of these mothers, monitoring and support services are needed. The program described herein seeks to partially fill this need. Psychotherapy had a high rate of agreement by mothers in need (73%) when offered in this specific NICU setting. Despite the many aforementioned barriers to care, 56% of those referred were seen for psychiatric evaluation and treatment. Those who did follow through with psychiatric treatment had infants with longer lengths of stay in the NICU, and may have experienced poorer social support and greater stressors as they were more likely to be unmarried, younger and less educated. For those who did not agree to psychiatric evaluation and had challenging interactions with staff, targeted staff interventions sought to optimize interactions and medical practice. We speculate that, based on staff reporting, that often, discussing difficult mental health cases could help improve their management.

Counseling or therapy allows processing of the birth experience, expression of feelings, and addressing of misunderstandings. (17) Despite their anxiety or depression, women do value opportunities to discuss their childbirth experiences (18) and women prefer psychotherapy to medications for depression. (19) In light of past research, part of our psycho-educational component of psychiatric treatment was to encourage mothers to care for themselves and utilize their support networks.

Melnik and colleagues found that NICU mothers participating in a specific educational-behavioral intervention program reported significantly less stress, depression and anxiety (20). They were also more positive in parent-infant interactions, with stronger beliefs about their parental role, and better understanding of infant behaviors. Notably, their infants had a 3.8-day shorter length of NICU stay. Ours was not an outcome study. However, parents who have their mental health issues treated are likely to experience better bonding with their

infant and engagement in care related to symptomatic improvement, potentially having an effect on the NICU itself and their length of stay. We speculate that a program such as the one described herein can be beneficial to both mothers and in turn their infants. If a hospital budget does not include funding, alternative mechanisms such as philanthropic donations or experience for supervised advanced trainees can be sought.

This exploratory study is descriptive of mothers referred to the NICU psychiatrist in one innovative program, targeting mothers with mental health concerns and distress related to or exacerbated by NICU hospitalization. The program itself was designed to provide support to this group, rather than those with longer term established serious mental illness or substance problems, who would have needs beyond what such a program could provide. It is limited to those in whom non-psychiatric NICU staff recognized mental health disturbances, rather than including comprehensive screening measures. Despite this case finding mechanism, 6% of all mothers were referred for psychiatric evaluation and treatment. Future studies should systematically evaluate the prevalence of depression and anxiety among the whole population of NICU parents, as it is certain that not all parents with mental illness were referred to the program. Further, information about longitudinal outcomes in mothers and infants was not available in this exploratory study; future studies may evaluate the long-term benefits of therapy and outcomes. In sum, the current study suggests the need and desire for short-term psychotherapeutic treatment of depression, anxiety, and coping, among a percentage of NICU mothers identifiable by staff. Further research may identify mothers in additional systematic ways and may explore outcomes measures.

Conclusions

Mothers in the NICU have elevated rates of depression, anxiety, and difficulty coping, resulting in a predictable need for treatment by a mental health professional, and predictable barriers to care related to their infant's hospitalization. Knowledge of common parental disorders and how to best deal with them can help not only the parent but also the infant and the NICU itself. (21) Having a psychiatrist physically present in the NICU can facilitate access to care, and can help staff most effectively deal with parents whose mental health issues are causing difficult interactions. We speculate that potential benefits of a psychiatrist's presence in the NICU include decreasing mental health symptomatology, improving early parental functioning, fostering a better parent-child relationship in this high-risk group, and improving the treatment team's morale.

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Key Notes

Mothers of critically ill neonates may suffer from stress, depression and anxiety, leading to further morbidity in the family; however, few programs exist specifically to evaluate and treat this at-risk population. Psychiatric services occurring within the NICU itself were accepted by the majority of referred mothers. The psychiatrist can also help promote healthy staff interactions with parents who exhibit inappropriate behaviors.

Table 1

Characteristics of Infants of Referred Mothers

	N (%)
Gestational age (mean +/- SD)	31.7 weeks +/- 5.7 (range 22-41)
Birth weight (mean +/- SD)	1813g +/- 1090 (range 320-4170)
Premature (<36 weeks)	106 (71%)
<28 weeks	47 (31%)
Birth weight category	
-Very Low Birth Weight (<1.5kg)	69 (47%)
-Low Birth Weight (1.5kg-2.5kg)	34 (23%)
-Birth Weight >2.5kg	43 (30%)
Sex	
-male	74 (49%)
-female	76 (51%)
Multiples	17 (11%)
Malformations	44 (29%)
Length of stay (mean +/- SD)	77 days +/- 76 (range 3-384); median 51
Length of stay	
< 1 month	56 (37%)
-1-3 months	44 (29%)
> 3 months	50 (33%)

Table 2

Characteristics of Referred Mothers

	N (%)
Age (mean +/- SD)	26.8 +/- 6.1 years
Race	
-African America	72 (49%)
-Caucasian	72 (49%)
Ethnicity	
-Hispanic	8 (5%)
Marital status	
-Married	62 (41%)
-Single, never married	86 (57%)
-Divorced	1 (1%)
Father of Baby Known Involved	105 (70%)
Education	
< High school graduate	13 (11%)
-High school graduate	53 (43%)
-some college completed	12 (10%)
-College degree or higher	39 (36%)
Occupation	62 (47%)
-Employed full time	13 (10%)
-employed part time	61 (45%)
-Unemployed	13 (9%)
-Student	
Prior pregnancies	88 (72%)
Maternal mental health history	45 (32%)
-Psychiatric problems in pregnancy	23 (17%)
Substance abuse history	20 (14%)
Infertility issues	7 (5%)
Maternal medical problems	47 (35%)
Referral reason	
-Depression	60 (43%)
-Anxiety	61 (44%)
-NICU stress	84 (60%)
-Relationship issues	26 (19%)
-External stressors	22 (16%)

	N (%)
-Substance abuse	6 (4%)
-Other	30 (21%)
Accepted referral	96 (73%)

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Table 3

Diagnostic and Treatment Data

Diagnosis if known:	
-Depression	38 (40%)
-Anxiety	30 (31%)
-PTSD	5 (5%)
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Seen by psychiatrist	84 (56%)
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Consultations	
-seen once	39 (48%)
-seen twice	19 (24%)
-three or more visits	23 (28%)
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Referral post-discharge	46 (33%)
Post-discharge contact by phone	17 (12%)

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