Case Report of the Incidence of Maternal Depression at a Community Level III, 39-Bed NICU

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Postpartum depression (PPD) is a vastly undetected, underdiagnosed, and untreated mental health concern for all mothers with infants. Having an infant in the neonatal intensive care unit (NICU) has an even higher impact on mothers' mental health, predisposing them to a higher rate of PPD. The aim of this project was to identify the incidence of PPD in a Level III NICU to determine appropriate intervention strategies. All mothers with NICU infants 14 to 20 days were invited to complete the 10-question Edinburgh Postnatal Depression Screening (EPDS). The EPDS was scored, and a NICU social worker discussed the results and offered resources for those with scores of ≥ 10 . The incidence of positive screens at our institution was 71.9% for an EPDS score with a cutoff ≥ 10 , and 50% for an EPDS score with a cutoff ≥ 13 . Simple strategies, including routine screening, PPD groups, and NICU support groups, were implemented. All NICUs should know the incidence of mothers' PPD. Acting on this information flows downstream to improving the health of the infant and family.

Keywords: postpartum depression; NICU; EPDS; maternal; depression

Postpartum depression (PPD), in general, is a vastly undetected, underdiagnosed, and untreated mental health condition (Rogers, Kidokoro, Wallendorf, & Inder, 2013; Tahirkheli, Cherry, Tackett, McCaffree, & Gillasp, 2014). Childbirth and welcoming a new baby are normal life stresses, but when that baby is separated from the mother at delivery, and the outcome of the infant's life is uncertain, a deeper discrepant stress is involved. Theorists Adams and Higgins (Adams, 2015) show that this discrepancy in mother-infant separation is a factor that increases the incidence of PPD. Mothers of infants born prematurely, who are in the neonatal intensive care unit (NICU), have higher PPD rates than the general population (Hawes, McGowan, O'Donnell, Tucker, & Vohr, 2016; Northrup, Evans, & Stotts, 2013; Yurdakul et al., 2009). Maternal depression results in a host of adverse effects for mother and child, including not meeting breastfeeding goals and attachment insecurity (Vasa et al., 2014).

Current estimates of PPD in the general population of high-income countries are at 13%; estimates of the incidence of maternal depression among mothers with babies born prematurely or who are low birthweight range between 28% and 40% (Gavin et al., 2005; Sundaram, Harman, & Cook, 2014; Vigod,

Villegas, Dennis, & Ross, 2010). There is limited data for mothers' incidence of depression when they had babies in the NICU specifically, but estimates range between 16% and 41.7% (Hawes et al., 2016; Knights, Salvatore, Simpkins, Hunter, & Khandelwal, 2016).

While gathering data for a project aimed to examine factors associated with depression among mothers with babies in a Level III, 39-bed NICU, we found the incidence of depression at 71.9%, much higher than previously reported incidence rates for mothers of babies in the NICU and among preterm and low birthweight babies. The incidence of depression at our NICU was even higher compared to mothers whose hospitalized babies just were released from ventilators; 63% (Miles, Holditch-Davis, Schwartz, & Scher, 2007).

This may be a statistical anomaly, but it also may be a trend that can be paired to the opioid epidemic, expanding health and economic inequities and NICU environments. Our purpose of this case report is to alert clinicians and stakeholders of a potential exacerbation of depression among mothers with babies in the NICU.

Methods

Data Collection

This select population was identified to investigate the factors associated with the incidence of PPD in this

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TABLE 1. Demographics of the Study Population at Our Community Level III, 39-Bed NICU, 2017

Demographic Variable	Frequency (%)
Race/ethnicity	
White	23 (71.9)
Non-White/Hispanic	9 (28.1)
Marital status	
Married	14 (43.8)
Not married	18 (56.2)
Insurance ^a	
Medicaid	18 (58.1)
Other	13 (41.9)
Mother's age (average and standard deviation)	28.7 (6.4)
Gestational age (average and standard deviation)	31.6 (3.9)

^aOne mother missing insurance information.

Level III, 39-bed NICU. This project was approved by our institution's Human Research and Institutional Review Board. All mothers of infants admitted to the NICU between February and July 2017 were offered the opportunity to participate while their baby was a patient on days 14–20; 32 mothers participated. The demographics are listed in Table 1. Mothers were provided written instructions about the project and an Edinburgh Postnatal Depression Screening (EPDS) to privately complete and return in a sealed envelope. The range of the EPDS score is from 0 to 30; a score of ≥ 10 indicates possible depression, and ≥ 13 indicates probable depression (Gibson, McKenzie-McHarg, Shakespeare, Price, & Gray, 2009; Murray & Carothers, 1990). The survey scores were calculated by one designated team member, and referrals to the clinical social worker were made for screening scores ≥ 10 , as suggested by the EPDS authors.

Results

The incidence of positive screens for PPD for NICU mothers at our institution at days 14–20 was 71.9% for an EPDS score with a cutoff ≥ 10 , and 50% for an EPDS score with a cutoff ≥ 13 .

Discussion

The mothers of NICU babies at our institution were between 3.5 and 4.3 times more likely to need a referral due to EPDS scoring ≥ 10 than a large sample of mothers of NICU babies identified between 2012 and 2015 in Rhode Island (i.e., 71.9% vs. 18%–22%) reported by Hawes et al. (2016). Mothers at our institution were 3.2 times more likely to report depression than a U.S. national sample of women with preterm infants (71.9% vs. 24.8%) reported by the national Pregnancy Risk Assessment Monitoring System survey (Sundaram et al., 2014). In addition, mothers in our sample were 3.2 times more likely to have suicidal thoughts compared to national averages of 3.9%; a 221% increase (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014).

The experience at our institution could be spurious or, since our data are the most recently reported, related to a trend that can be paired to the opioid epidemic, expanding health and economic inequities and NICU environments. Regardless, identifying a mother at risk for emotional sequela with a simple screening tool is a logical step in protecting the NICU vulnerable population. This intervention impacts large populations through regulation and access that affect behavior and practices; an effective midstream intervention.

Discovering the incidence of PPD of mothers with infants in each NICU is important to the family's emotional health and experts recommend universal screening to prevent barriers to care (Potter, 2017). Although personal and family history of depression are important risk factors for PPD, most women with PPD do not have a history of depression (Vigod et al., 2010). On the other hand, income inequality is associated with depression (Patel et al., 2018). There have been huge increases in income inequality in the United States since 1990, and in fact, research has shown that the financial mechanisms used by the United States for healthcare exacerbate income inequality (Christopher, Himmelstein, Woolhandler, & McCormick, 2018), not to mention that the cost of care for preterm babies in the NICU can average between \$114,000 and \$220,000 (Meadow et al., 2012).

Another factor that may be influencing PPD among mothers with babies in the NICU is the opioid epidemic. Between 2000 and 2009, opioid use among women who gave birth increased in the United States from 1.19 to 5.63 per 1,000 hospital births per year (Patrick et al., 2012). More recently, data from the

National Survey on Drug Use and Health indicate, in 2015, 17.9% of pregnant women used illicit drugs in past year, but in 2012, 13% pregnant women used illicit drugs in the past year (SAMHSA, n.d.a), indicating increased drug use may also be a future trend. Up to 33% of pregnant women who use opioids also have psychiatric comorbidities (Arnaudo, Andraka-Christou, & Allgood, 2017). Besides financial costs, the NICU environment can be stressful in itself due to the medical equipment, high level of activity among staff, medical terminology being used, noise, light, appearance of the infant, and anything that interferes with a sense of motherhood (Tahirkheli et al., 2014; Vazquez & Xiaomei, 2016).

As of 2016, a total of 18 states mandate screening for PPD (Knights et al., 2016), but the state in which this study was conducted is not one of them. More and more babies are being born prematurely and surviving though care delivered in the NICU. Even if the rate of PPD among mothers of NICU babies is not increasing, the absolute number of mothers with PPD will inevitably increase.

NICUs who are not already providing PPD screenings are encouraged to evaluate their mothers with the EPDS at 2 weeks postpartum. Raising awareness of PPD to the family, as well as to the healthcare providers to focus interaction with the family and the NICU environment, would be therapeutic. If each individual NICU knew their mothers' EPDS score, a simple intervention for the mental health of the NICU mother could be initiated. Meeting the family's needs through prompt referrals and intervention is imperative.

The U.S. preterm birth rates decreased from 2007 to 2014, due, in part, to declines in the number of births to teens and young mothers. However, the preterm birth rate rose in 2015–2016. The reasons for preterm births are multifactorial, but are 50% higher among African Americans, and this should be an area of active investigation.

Limitations and Future Directions

The transferability of our findings is limited by the fact that our study took place in one particular hospital. The Unit Clerk offered the EPDS to each family. Consistent social service and nurse support may have resulted in more volunteers. Generally, nonparticipants are different than participants, so all families should be evaluated. Future research directions include replication of this project but to have

100% inclusion as standard workflow along with staff support. More research must be done to provide screening for mothers in the NICU to prevent psychosocial problems from occurring after discharge.

Conclusion

Having an infant in the NICU is often an uncontrollable event. The discrepancy between an anticipated birth outcome and a NICU admission can impact the mother's emotional well-being. This may manifest in a higher incidence of PPD. There can be an intervention for this emotional well-being threat. Crafting responses to the mother's preconceived expectations and supporting her emotional well-being must be part of the NICU policy and environmental focus. Understanding this context lends urgency to the need for all healthcare professions to support the screening of all mothers of infants who spend longer than 2 weeks in the NICU.

The results are being used to demonstrate a need for targeted intervention for identifying and treating PPD in this vulnerable population. The results have also been used to advocate for screening to become a standard of care in the NICU. In addition, a behavioral health provider led weekly group for PPD in the NICU will be implemented. These simple strategies can positively impact the mental health of the mothers in all NICUs, which flows downstream to the health of the infant.

References

- Adams, M. (2015). Motherhood: A discrepancy theory. *Research and Theory for Nursing Practice*, 29(2), 143–157. <http://dx.doi.org/10.1891/1541-6577.29.2.143>
- Arnaudo, C. L., Andraka-Christou, B., & Allgood, K. (2017). Psychiatric co-morbidities in pregnant women with opioid use disorders: Prevalence, impact, and implications for treatment. *Current Addiction Reports*, 4(1), 1–13. <http://dx.doi.org/10.1007/s40429-017-0132-4>
- Christopher, A. S., Himmelstein, D. U., Woolhandler, S., & McCormick, D. (2018). The effects of household medical expenditures on income inequality in the United States. *American Journal of Public Health*, 108(3), 351–354. <http://dx.doi.org/10.2105/AJPH.2017.304213>
- Gavin, N. I., Gaynes, B. N., Lohr, K. N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal depression: A systematic review of prevalence and incidence. *Obstetrics and Gynecology*, 106(5 Pt 1), 1071–1083. <http://dx.doi.org/10.1097/01.AOG.0000183597.31630.db>
- Gibson, J., McKenzie-McHarg, K., Shakespeare, J., Price, J., & Gray, R. (2009). A systematic review of studies validating the Edinburgh postnatal depression scale in antepartum and postpartum women. *Acta Psychiatrica Scandinavica*, 119(5),

- 350–364. <http://dx.doi.org/10.1111/j.1600-0447.2009.01363.x>
- Hawes, K., McGowan, E., O'Donnell, M., Tucker, R., & Vohr, B. (2016). Social emotional factors increase risk of postpartum depression in mothers of preterm infants. *The Journal of Pediatrics*, 179(67), 61–67. <http://dx.doi.org/10.1016/j.jpeds.2016.07.008>
- Knights, J. E., Salvatore, M. L., Simpkins, G., Hunter, K., & Khandelwal, M. (2016). In search of best practice for postpartum depression screening: Is once enough? *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 206, 99–104. <http://dx.doi.org/10.1016/j.ejogrb.2016.08.030>
- Meadow, W., Cohen-Cutler, S., Spelke, B., Kim, A., Plesac, M., Weis, K., & Lagatta, J. (2012). The prediction and cost of futility in the NICU. *Acta Paediatrica*, 101(4), 397–402. <http://dx.doi.org/10.1111/j.1651-2227.2011.02555.x>
- Miles, M. S., Holditch-Davis, D., Schwartz, T. A., & Scher, M. (2007). Depressive symptoms in mothers of prematurely born infants. *Journal of Developmental & Behavioral Pediatrics*, 28(1), 36–44.
- Murray, L., & Carothers, A. D. (1990). The validation of the Edinburgh post-natal depression scale on a community sample. *British Journal of Psychiatry*, 157, 288–290. <http://dx.doi.org/10.1192/bjp.157.2.288>
- Northrup, T. F., Evans, P. W., & Stotts, A. L. (2013). Depression among mothers of high-risk infants discharged from a neonatal intensive care unit. *MCN, The American Journal of Maternal/Child Nursing*, 38(2), 89–94. <http://dx.doi.org/10.1097/NMC.0b013e318270f8b8>
- Patel, V., Burns, J. K., Dhingra, M., Tarver, L., Kohrt, B. A., & Lund, C. (2018). Income inequality and depression: A systematic review and meta-analysis of the association and a scoping review of mechanisms. *World Psychiatry*, 17(1), 76–89. <http://dx.doi.org/10.1002/wps.20492>
- Patrick, S. W., Schumacher, R. E., Benneyworth, B. D., Krans, E. E., McAllister, J. M., & Davis, M. M. (2012). Neonatal abstinence syndrome and associated health care expenditures: United States, 2000–2009. *JAMA*, 307(18), 1934–1940. <http://dx.doi.org/10.1001/jama.2012.3951>
- Potter, M. T. (2017). Nurse-led initiatives to implement universal screening for perinatal emotional complications. *Nursing for Women's Health*, 21(6), 452–461. <http://dx.doi.org/10.1016/j.nwh.2017.10.010>
- Rogers, C. E., Kidokoro, H., Wallendorf, M., & Inder, T. E. (2013). Identifying mothers of very preterm infants at-risk for postpartum depression and anxiety before discharge. *Journal of Perinatology*, 33(3), 171–176. <http://dx.doi.org/10.1038/jp.2012.75>
- Substance Abuse and Mental Health Services Administration. (n.d.a). Substance Abuse and Mental Health Services Administration's public online data analysis system survey: National Survey on Drug Use and Health, 2012 (Run at: 24 Jan 2018, 10:34 AM). Retrieved from http://pdas.samhsa.gov/#/survey/NSDUH-2012-DS0001/crosstab/?weight=ANALWT_C&results_received=true
- Substance Abuse and Mental Health Services Administration. (n.d.b). Substance Abuse and Mental Health Services Administration's public online data analysis system survey: National Survey on Drug Use and Health, 2015 (Run at: 24 Jan 2018, 10:38 AM). Retrieved from http://pdas.samhsa.gov/#/survey/NSDUH-2015-DS0001/crosstab/?weight=ANALWT_C&results_received=true
- Substance Abuse and Mental Health Services Administration. (2014). Results from the 2013 national survey on drug use and health: Mental health findings, NSDUH Series H-49, HHS Publication No. (SMA) 14-4887. Retrieved from <http://www.samhsa.gov/data/sites/default/files/NSDUHmhfr2013/NSDUHmhfr2013.pdf>
- Sundaram, S., Harman, J. S., & Cook, R. L. (2014). Maternal morbidities and postpartum depression: An analysis using the 2007 and 2008 pregnancy risk assessment monitoring system. *Women's Health Issues*, 24(4), e381–e388. <http://dx.doi.org/10.1016/j.whi.2014.05.001>
- Tahirkheli, N. N., Cherry, A. S., Tackett, A. P., McCaffree, M. A., & Gillaspay, S. R. (2014). Postpartum depression on the neonatal intensive care unit: Current perspectives. *International Journal of Women's Health*, 6(975–987), 975–987. <http://dx.doi.org/10.2147/IJWH.S54666>
- Vasa, R., Eldeirawi, K., Kuriakose, V. G., Nair G, J., Newsom, C., & Bates, J. (2014). Postpartum depression in mothers of infants in neonatal intensive care unit: Risk factors and management strategies. *American Journal of Perinatology*, 31(5), 425–433. <http://dx.doi.org/10.1055/s-0033-1352482>
- Vazquez, V., & Xiaomei, C. (2016). Relationships of parent-infant contacts and postpartum depressive symptoms in mothers of preterm infants in the NICU: A mixed methods study. 28th annual scientific session. *Nursing Research*, 65(2), E55–E56.
- Vigod, S. N., Villegas, L., Dennis, C. L., & Ross, L. E. (2010). Prevalence and risk factors for postpartum depression among women with preterm and low-birth-weight infants: A systematic review. *BJOG: An International Journal of Obstetrics & Gynaecology*, 117(5), 540–550. <http://dx.doi.org/10.1111/j.1471-0528.2009.02493.x>
- Yurdakul, Z., Akman, I., Kuşçu, M. K., Karabekiroğlu, A., Yaylalı, G., Demir, F., & Ozek, E. (2009). Maternal psychological problems associated with neonatal intensive care admission. *International Journal of Pediatrics*, 2009, 1–7. <http://dx.doi.org/10.1155/2009/591359>

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Call to Increase Breastfeeding in Wealthy Countries, From UNICEF

The United Nations Children's Fund has issued a call for high-income countries to encourage more breastfeeding (<https://news.un.org/en/story/2018/05/1009322>). In high-income countries, 21 per cent of babies are not breastfed at all, while in low- and-middle-income countries, the figure on average is only four per cent. UNICEF urges governments, the private sector and civil society to increase funding and awareness to raise breastfeeding rates from birth, through the age of two, and it outlines other factors effecting breastfeeding rates, such as introducing strong legal measures to regulate the marketing of infant formula and other breastmilk substitutes; enacting paid family leave and putting in place workplace breastfeeding policies, including paid breaks for new mothers.

Source: USBC