INTRODUCTION

We are neonatologists, mothers whose own infants have required neonatal intensive care, and have been personally impacted by perinatal mood and anxiety disorders (PMADs) [1]. We know, first hand, the benefits of PMAD awareness, screening, and access to treatment, as well as several shortfalls in our current neonatal intensive care unit (NICU) systems related to this important topic. While we see a growing body of literature around PMADs, with increasing attention toward mental health initiatives, we also see families every day who have fallen through the cracks of our care system, and well-intentioned colleagues unaware of the gravity of the problem and/or how to help. So, we want to help spark momentum around PMAD awareness and intervention specifically within the neonatology community. We want to accelerate the progress that we, as a nation of neonatal care providers, can make in supporting our NICU families through changes in NICU care models and additional research into the impact of PMADs on our developing infants.

EPIDEMIOLOGY

Perinatal mood and anxiety disorders, which develop during pregnancy or within a year following birth, affect at least 15–20% of pregnant and postpartum women [2]. Rates of PMADs are particularly high among parents of infants admitted to the NICU. Compared to parents of well newborns, NICU parents have a 20–30% higher prevalence of PMADs [3–12]. Unfortunately, epidemiologic studies estimate that 50–70% of PMADs go undiagnosed, and for the minority who are able to receive an appropriate PMAD diagnosis, only 50% are able to access adequate treatment [13].

ENHANCED EDUCATION TO IMPROVE PMAD AWARENESS

We believe that the low level of diagnosis and treatment for PMADs in the NICU partly stems from a lack of recognition of the problem by families and care providers alike, as well as the stigma of mental illness diagnoses, often exacerbated by gender identity, structural vulnerabilities, and cultural perceptions of PMADs.

Untreated or undertreated PMADs are associated with worse physical health outcomes for both mothers and their children, including severe maternal morbidity and mortality in the first year postpartum [2, 13–17]. Postpartum depression represents the greatest risk factor for maternal suicide and infanticide [13]. Neonatologists should be aware that children of mothers with PMADs have increased risk of prematurity, sudden infant death, and need for neurodevelopmental and neurobehavioral support services [16, 18]. A study based on a 2017 birth cohort in the United States projected that PMADs would cost $14 billion dollars from conception to 5 years postpartum [16]. The average estimated cost per affected mother-child dyad was $31,800, more than one third of which was incurred by the children’s care costs [16].

In acknowledgement of the scope and gravity of PMADs, the American Academy of Pediatrics (AAP), the American College of Obstetricians and Gynecologists, and the U.S. Preventive Services Task Force uniformly recommend screening of postpartum women for depression as a component of quality maternal-child healthcare [2, 17, 19]. Despite this, we have often encountered families in the NICU who are suffering from undiagnosed and/or untreated PMADs. We would like to share some of the observations that we have made from both our personal and professional experience with PMADs, and how we see care improving for NICU families with PMADs.
Additionally, outpatient pediatric visits following NICU discharge can evolve over time, serial screening is important for NICU families.

We believe that an understanding of the long-lasting effects of psychological trauma on the human body for generations may allow some NICU care providers and families to better appreciate the importance of identifying risk factors for PMADs, and provide support for all families in the NICU through trauma-informed care. By integrating trauma-awareness into the care model of the NICU, we can normalize the physical response to stress and the risk of its toxicity for our NICU patients, families and caregivers. This could help propel the destigmatization of PMADs.

We applaud efforts from the American Board of Pediatrics and the Accreditation Council on Graduate Medical Education to build mental health training into the curriculum of pediatric residents and neonatal-perinatal medicine (NPM) fellows [26, 27]. These newly trained physicians can help become champions for PMAD educational initiatives, as a group of NPM fellows on the AAP Section on Neonatal Perinatal Medicine, Training and Early Career Neonatologist Advocacy Committee have with a recent NICU Mental Health Campaign.

To further the national attention on this issue and more rapidly spread acceptance of the need for comprehensive PMAD identification and treatment, we recommend the AAP Committee on the Fetus and Newborn and/or AAP Committee on Psychosocial Aspects of Child and Family Health release updated policy reports, spotlighting how a mental health workforce based in the NICU could make a significant, positive public health impact for NICU patients and their families.

Ultimately, to maximize the rate and breadth of a culture shift toward PMAD acceptance and effective support, we will need to employ a combination of educational opportunities targeting various stakeholders including physicians, advanced practice providers, nurses, developmental therapists, lactation specialists, social workers and spiritual health providers, as well as NICU families.

IMPROVING NICU FAMILY SCREENING TO INCREASE PMAD DIAGNOSIS

We believe that significant gaps in the structure and consistency of PMAD screening within the NICU also contribute to underdiagnosis. To improve, we first need to widen the scope of symptoms that are screened for. The umbrella term PMAD includes postpartum depression (PPD), but also anxiety, post-traumatic stress disorder (PTSD), obsessive compulsive disorder, and others [14, 28]. While postpartum depression and anxiety remain the most common types of PMAD in NICU families, other types of PMAD are not infrequent. NICU parents have a higher rate of PTSD, in particular, as compared to parents of well newborns [3–6, 8, 10, 29]. As a result, a broader range of symptom surveillance will be needed to effectively identify those with different types of PMAD.

We next suggest expanded timing of PMAD screening, which by current design typically happens in the immediate postpartum maternal inpatient hospital stay, and at outpatient obstetric and pediatric routine follow-up visits [19, 30]. Because PMAD symptoms can evolve over time, serial screening is important for NICU families. However, parents of preterm infants may miss some, or all, of the AAP recommended PPD screenings at 1-, 2-, 4-, and 6-month well child visits, as their infants may still be admitted to the NICU. Additionally, outpatient pediatric visits following NICU discharge may have their focus pulled toward the on-going medical care needs of the infant rather than PMAD screening. Up to 40% of women miss their routine postpartum obstetric appointment with its associated PMAD screening opportunity [30]. Of these women, a disproportionate number are women of color, low economic status, and those with high life stressors, such as having a baby in the NICU [30]. Repeated screening of parents during high-risk pregnancy and while their child is still inpatient would improve catchment of families’ developing PMAD symptoms related to the changing stressors of parenting a child with complex medical needs.

Thirdly, we propose that screening programs for PMAD extend beyond biological mothers to include other primary caregivers. Our NICU families are varied in make-up with primary caregivers including fathers, non-gestational mothers, grandparents, planned adoptive parents, and others. We have found that no primary caregiver escapes the toll of loving a critically ill infant. Fathers, in particular, experience significant stress and mental health burden during the postpartum period. Studies specific to NICU parents have highlighted both the frequency of PMAD symptoms in NICU fathers as well as the differences between NICU fathers and mothers in terms of PMAD severity and duration [5, 8, 9, 29, 31–34]. While recommendations exist to assess fathers’ mental health and adjustment to parenting [19, 35], in our experience this is not often being translated into action. We suggest that PMAD screening is applicable to any adult who is acting in a parental role to a hospitalized neonate.

USING EXISTING RESOURCES TO IMPLEMENT PMAD SCREENING, Referral, AND TREATMENT IN THE NICU

Improved awareness of and broader screening for PMAD in the NICU need to be accompanied by a stronger system of referral and treatment to achieve the positive progress we hope to see. Discrete steps toward building this system are outlined in the “Consensus Bundle on Maternal Mental Health: Perinatal Depression and Anxiety [17].” These core steps include identifying the right mental health screening tools, educating staff on how and when to use the screening tools, establishing a protocol for responding to positive screens by employing local mental health support resources, having an emergency response system for any positive screens indicating suicidality or threat of harm to others, implementing a systematic review process to address balancing measures for quality improvement, and continuing efforts toward a local culture of knowledge and acceptance of PMAD and its significance [17]. To support a NICU team in moving through these steps, we will touch on available tools that can be employed in these efforts and highlight several recommendations from previous research.

While there is no single, comprehensive PMAD screening questionnaire, there are several available tools that can be used in concert. The Edinburgh Postnatal Depression Scale (EPDS) screens for both depression and anxiety symptoms, excludes constitutional symptoms such as changes in sleep that are universal to new parents, and has been translated into 50 languages. The Patient Health Questionnaire (PHQ9), General Anxiety Disorder (GAD7) screen, and Primary Care PTSD Screen (PC-PTSD-5) are designed for use in the general population to screen for depression, anxiety, and PTSD, respectively, but have each been validated specifically for the perinatal population, as well [9, 36–38]. Each of these screens takes less than 5 minutes to complete and has high sensitivity and specificity for identifying its targeted condition(s) [9]. Ideally, PMAD screening would start in the antepartum period for families anticipated to have a child admitted to the NICU [14, 39–41]. With or without an antenatal meeting, NICU mental health support staff should meet with each NICU family in the first 72 hours of a child’s admission to (re)establish a working relationship, normalize emotional distress, and identify additional PMAD risk factors [42]. At a minimum, formal parental PMAD screening should then take place during the first week of a child’s admission, 1–2 days prior to anticipated NICU discharge for admissions greater than 1–2 weeks, and during NICU developmental follow-up visits in the first year.
after NICU discharge [3, 10, 12, 42, 43]. Additional screening may be necessary for families with more risk factors.

The NICU team will need to build a system for reviewing screens, and then providing those who screen positive with appropriate referrals for mental health support services. Note that previous studies have shown that the majority of women who screen positive for a postpartum mental health disorder do not utilize their mental health referral, in part because referrals to outside mental health providers are often perceived by families as added stress, requiring extra appointments at additional facilities [4, 9, 11, 42, 44, 45]. Psychologists and psychiatrists dedicated to the treatment of NICU parents and working within the NICU itself could, therefore, greatly improve referral uptake. In fact, prior studies evaluating the benefit of psychotherapy conducted within the physical space of the NICU have shown significant reduction in PMAD symptoms in parents [33, 42].

This call for a stronger mental health support team within the NICU is not novel. A multidisciplinary workgroup of NICU clinical care providers and NICU parents representing 29 professional and parent groups and 22 academic institutions came together through the National Perinatal Association to discuss psychosocial support for parents of NICU infants [39, 42]. They published recommendations in a supplemental issue of the Journal of Perinatology, including that NICUs with 20 or more beds should employ at least one part-time master’s level social worker, one part-time doctoral level psychologist, and should consider employing a part-time psychiatrist and psychiatric nurse [42]. This type of perinatal mental health workforce could potentially facilitate PMAD screening, counseling, and potential treatment for NICU families in addition to educational initiatives for NICU staff [42].

The funding allocated for NICU mental health professionals and rates of insurance reimbursement vary between healthcare systems and states and can be a significant limiting factor to implementing teams as described above. While these mental health support services are likely to be cost-effective when taking into account the broader, long-term impacts of PMADs, their funding would necessitate up-front investment from hospital administrators and would benefit from optimization of billing practices [42].

An additional way to bring mental health services to families in the NICU at a lower cost is through telehealth services. Although the merits and potential pitfalls of mental health support delivered remotely are beyond the scope of this perspective, telehealth and telepsychiatry, accelerated by the COVID-19 pandemic, have improved general access to mental health care [46–48]. Mobile applications and secure messaging platforms show promise for the digital delivery of mental health education, interventions and self-guided care [49–51]. These types of applications may prove helpful in the NICU parent population.

Better family care yields better infant outcomes

Un-treated PMAD symptoms come with staggering costs, as previously described. As neonatologists, we take particular interest in the global data demonstrating that perinatal mental health disorders are associated with a negative impact on developing infants’ physical, socioemotional, cognitive and mental health that can be pervasive throughout their lives and even subsequently transmitted to future generations [52–59]. While all children and families could benefit from strong systems of PMAD symptom recognition and treatment, this benefit is particularly significant for children who require NICU care due to extremely premature birth or complex medical needs. These children are already at risk for poor neurodevelopment and mental health outcomes over their lifetimes, which would be compounded by untreated parental PMAD symptoms.

Perinatal mental health interventions could also be particularly impactful for NICU parents facing structural adversities, in part because PMAD disproportionately affects parents with lower socioeconomic status, poor social support, multiple gestations, and preterm infants admitted to the NICU [19, 30, 58, 60]. Recent research has evaluated disparities between preterm infants by race and ethnicity, and associated these disparities with impacts on quality of care and long-term health outcomes, with black infants most negatively affected [60, 61]. Since the potential for a positive impact of improved PMAD identification and treatment is magnified within these groups, they should be prioritized in research initiatives.

Conclusions

We believe that increased awareness, screening, and treatment of PMADs in NICU parents have the potential to improve family-infant outcomes. To maximize this impact, we need institutional commitment from healthcare organizations, buy-in for resource mobilization at the local, state and national levels, and engagement from multidisciplinary teams invested in the hard work of structural change, particularly focused on those most underserved by the current system. We call on neonatal providers to advocate for policy changes, quality improvement initiatives, updated educational curricula for neonatal fellows, and outcomes-based research supporting PMAD treatment in NICU parents. We believe these efforts align with the mission of the AAP: to strive for optimal physical, mental, and social health from infancy into young adulthood [62].
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