Journal of Neonatal Nursing 25 (2019) 51–53

Contents lists available at ScienceDirect

Journal of Neonatal Nursing

journal homepage: www.elsevier.com/locate/jnn

Editorial

Spring into action

The Spring Issue of The Journal of Neonatal Nursing (JNN) focuses on a variety of studies and content related to Thermoregulation, and Therapeutic Hypothermia for hypoxic-ischemic encephalopathy (HIE). Child protection in the Neonatal Intensive Care Unit (NICU), Neuroprotective Care described in manuscripts on Parent-Infant bonding, Kangaroo Care, FINE developmental care training, The first manuscript for the April JNN issue is a review "The efficacy of interventions aimed at improving post-partum bonding: A review of interventions addressing parent-infant bonding in healthy and at-risk populations" by Dr. Eleonora Mascheroni and Ms. Chiara Ionio, from Italy. Mascheroni and Ionio present a review searching and describing the effectiveness of interventions addressing parent-infant bonding during the postpartum period. The studies included addressed parent-infant bonding both in normative and in at-risk situations with heterogenous methods. Thirteen interventions focusing on improving postpartum parental bonding were included and analyzed.

Kirsty Dixon and Susan Smith, from the UK, present the second review with their literature review on the topic of hypoxic ischemic encephalopathy (HIE). Because infants must meet strict criteria in order to be eligible for therapeutic hypothermia, Dixon and Smith reviewed the relevant research exploring the use of therapeutic hypothermia in infants with HIE who are excluded from therapeutic hypothermia when they do not meet eligibility criteria for cooling.

HIE (hypoxic-ischemic encephalopathy) is an injury to the brain caused by oxygen deficit resulting from either systemic hypoxemia (decreased oxygen in blood supply) or ischemia (diminished cerebral blood perfusion) or a combination of the two conditions. The hypoxemia and ischemia may occur simultaneously or sequentially, and it appears from recent evidence that ischemia is the more important of the two oxygen deprivation states in causing the brain injury. In addition, the subsequent reperfusion of the affected brain area has been shown to be the time at which the majority of the injury to the brain occurs. Glucose deprivation also plays a part in the severity of the brain injury (McAdams and Traudt, 2018; Inder and Volpe, 2018).

Induced hypothermia has been shown to provide neuroprotection and reduce the extent of tissue injury and is increasingly the treatment of choice for infants greater than or equal to 36 weeks' gestation with moderate to severe HIE (Bonifacio et al., 2012; Laptook, 2012; Pfister and Soll, 2010; Rutherford et al., 2010; Stola and Perlman, 2008; McAdams and Traudt, 2018; Inder and Volpe, 2018). Within 6 hours of birth is a therapeutic window demonstrated in sheep between insult and further cell death for neuroprotective interventions; early hypothermia studies indicate that cooling may be less effective if started after onset of seizures or in infants with most severe EEG changes before therapy (Gancia and Pomero, 2011; Gluckman et al., 2005; Gunn et al., 2008; Inder and Volpe, 2018; McAdams and Traudt, 2018; Liao, 2018).

To avoid physiologic consequences of cold stress or hyperthermia, the infant must be kept in a neutral thermal environment. This environment can best be described as a range of environmental temperatures where an infant can maintain a normal body temperature by using vasomotor control and changes in posture, with a minimum metabolic rate (Altimier, 2012). Infants are susceptible to the influence of the NICU ambient room environment. Temperature and humidity differ both by season and by rooms in the NICU. External windows, airflow, and variations in heating and cooling system all affect the room temperature. All of these variables create the need for close assessment and monitoring of the NICU environment to modify the ambient temperature as well as the environment in order to maintain a neutral thermal environment and a normothermic infant.

In order to provide best practices related to neonatal thermoregulation, Ms. Somaye Pouy and Ms. Minoomitra Chehrzad, from Iran present the first original article titled "Identification of the best skin temperature probe attachment place in premature neonates nursed under radiant warmers in the NICU: A diagnostic clinical trial study." The researchers seek the ideal location for utilizing a skin temperature probe to measure the temperature of premature infants. Seven skin locations were measured and correlated with the infant's axillary temperature in order to identify the ideal skin temperature probe (STP) placement.

The second study related to thermoregulatory principles is presented by Dr. Jill Chamberlain et al. from the USA in their manuscript titled "Impact on Delayed Newborn Bathing on Exclusive Breastfeeding Rates, Glucose and Temperature Stability, and Weight Loss." Traditional practice in the United States has been that newborns are bathed within six-hours of life (Brogan and Rapkin, 2017); however, WHO recommends delaying the bath until 24 hours after birth to retain the vernix which supports newborn transition from the intrauterine to extrauterine environment (2017). The US researchers utilized pre-post quasi-experimental retrospective chart reviews and pre-post surveys to determine the impact that delayed newborn bathing for 24 hours had on exclusive breastfeeding rates, temperature and glucose stability, and percentage of weight loss and, to determine if there was a difference in the nurses' knowledge and comfort levels regarding delayed bathing pre and post implementation. A new evidence-based practice protocol of delaying newborns' bath until 24 hours after birth was implemented.

The study team also wanted to determine if a mother's demographic variables such as education level, marital status, and age had any influence on her decision regarding delaying the newborn bath. This information was used to guide future education initiatives on delayed bathing. A final objective was to determine if there was a difference in the nurses' knowledge and comfort levels regarding delayed bathing pre and post implementation, to help determine the effectiveness of staff education and engagement regarding the new protocol.

There is a growing body of literature exploring both the experience

https://doi.org/10.1016/j.jnn.2019.01.003

Available online 08 February 2019
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and process of 'becoming a parent' to a premature infant in a Neonatal Intensive Care Unit (NICU), and the way in which health care practices can support and assist this significant process of transition. Elizabeth McLean, Katrina Skewes McFerran, and Grace Thompson from Australia, present the third original article highlighted in this issue of JNN titled "Parents' musical engagement with their baby in the neonatal unit to support emerging parental identity: A grounded theory study." Music therapists aim to empower parents in their 'musical' role as caregiver by offering support and education about parent's use of their own voice to connect, engage and soothe their baby. McLean et al. studies how a parent's musical engagement with their baby can contribute to their parental identity across the NICU journey.

The optimal healing environment for any infant is physical contact with his/her mother, or skin-to-skin contact (SSC) [also known as Kangaroo Care (KC)]. Continuous SSC with mother is the normal environment and developmental expectation for all newborns (N. Bergman, 2014). This is the developmentally expected habitat for all newly born infants where they can be co-regulated by their mothers to achieve ongoing physiologic stability. Mother's body is designed to be the regulator of the baby's physiologic stability and has been shown to do so even for babies born prematurely (NJ. Bergman et al., 2004; Chi Luong et al., 2016; Feldman et al., 2014; M. Hofer, 1994; Parmar et al., 2009; WHO, 2018). Separation, or the absence of contact with mother's or a primary caregiver's body, induces stress, dysregulation, and even neurologic changes in infant mammals early experience and neurobehavioral development (Arabadzisz et al., 2010; Loman et al., 2010; Michelsson et al., 1996; Morgan, 2013; Reite et al., 1978; Sabatini et al., 2007; Shonkoff et al., 2012). This stress is accompanied by high levels of cortisol, which if prolonged, leads to toxic stress, defined by Shonkoff as "stress in the absence of the buffering protection of adult support" (Shonkoff, 2010). Due to the stress and dysregulation that results whenever babies are apart from mother or another primary caregiver, Dr. Nils Bergman strongly advocates for a policy of Zero Separation except in life-threatening emergencies, surgical procedures or severe medical instability (N. Bergman, 2014; N. J. Bergman, 2015).

Continuous SSC with mother is the place where physiologic and hormonal regulation is designed to occur for the newborn and very young infant, as documented in both animal and human studies (Chi Luong, Long Nguyen, Huynh Thi, Carrara and Bergman, 2016; M. Hofer, 1994). Skin-to-skin contact increases oxytocin levels in both mothers and fathers, a hormone known to induce relaxation, facial recognition, and bonding. SSC also increases prolactin levels in mother, which is linked to increased breast milk production. Due to the close proximity to mother's breasts, SSC is associated with higher rates of breastfeeding.

The first few days after birth are a critical period for many physiologic and neurologic processes that occur during the complex and multifaceted adaptation to post-uterine life for both baby and mother. Some of these neurological processes are only available during the first day after birth, and if they are not allowed to occur, the window of opportunity is missed (Bartocci et al., 2000).

Although technology and skills available for newborn and preterm care are wonderful, they do not require separation; they should instead be applied to the right place, the mother's chest (Phillips, 2013; White, 2004). In this way, maternal, physiological regulation will be working in synergy with the baby's ANS, the need for technology will be lessened and the intensity thereof can be reduced, with better outcomes (Bergman, 2014). An essential requirement is maternal-infant 'togetherness', the first part of which is SSC, starting from the moment of birth and Zero Separation (Bergman and Bergman, 2013). Achieving 'togetherness' also requires that the father does SSC (Erlandsson et al., 2007; Bergman, 2015).

The fourth original article by Aude Buil, Laurence Caeymaex, Sophie Mero, Carol Sankey, Gisèle Apter, and Emmanuel Devouche, from France, further explore Kangaroo Care (also known as skin-to-skin contact) in premature infants. These researchers test the effects of Kangaroo Care (KC) positioning on maternal stress, postpartum depression risk and skin-to-skin daily practice, when comparing a new supported diagonal flexion (SDF) position during KC with the typical upright positioning in very preterm infants.

Neuroprotective developmental care is grounded in support by research from a number of disciplines including nursing, medicine, neuroscience, and psychology (Symington and Pinelli, 2006; Jacobs et al., 2002). Adaptation of the prematurely born infant to the unexpected surroundings of the neonatal intensive care unit can be facilitated when the infant's developmental needs are understood and characteristics of the environment are adapted accordingly (Warren, 2002). Improvements in health outcomes, lengths of stays, as well as hospital costs have been documented when neuroprotective education and subsequent change of care practices were implemented (Altimier et al., 2005; Altimier and White, 2019; Altimier, 2015; Liaw et al., 2009; Hendricks-Munoz, 2002; Hendricks-Munoz and Mayers, 2014; Ludwig et al., 2008; Coughlin, 2008; and Milette et al., 2005). For the implementation of neuroprotective developmental care to be successful, NICU staff must have the knowledge and skills to effectively implement this care and there must be cooperation and collaboration between health care providers (Altimier et al., 2015).

The Family and Infant Neurodevelopmental Education (FINE) program is a comprehensive, multidisciplinary educational pathway designed to support quality improvements in infant and family-centered developmental care in neonatal services. We share our final original article by Inga Warren, Ezam Mat-Ali, Mark Green, and Dumisani Nyathi, where they evaluate the impact of FINE on neonatal care in the UK. A mixed method evaluation was based on two surveys of staff to explore perceptions of change in the care of infants, parent participation, and staff experience since the introduction of FINE. Read further to see the results when the FINE program was implemented across a regional neonatal network in the UK.

It is estimated that 5000 babies each year in the United Kingdom are added to the At-Risk Child Protection Register by local authorities (Department of Education, 2015). Typically, infants who are discharged from a neonatal unit because they require a higher level of care, are more susceptible to neglect. Ashleigh Rogers and Sharon Nurse complete this Spring issue of JNN by sharing their practice guidelines related to "Child Protection in the Neonatal Unit." They discuss the role of the neonatal nurse in identifying families who present with potential indicators of abuse and neglect as well as identifying those parents who display maladaptive behaviors, which might make those babies more vulnerable to abuse and neglect. Their paper entwines current safeguarding policies and procedures in place across Northern Ireland that aim to reduce the incidences of abuse to this vulnerable group of infants we care for.

We hope that you enjoy the mix of research, literature reviews, and original articles presented in the April issue of JNN and challenge you to "Spring" forward and jump into action by:

1. "Spring" cleaning by stepping out of your old routines and habits,
2. "Springing" into action and challenge yourself and/or your NICU to explore one new idea or concept to implement, and
3. "Springing" forward to create a vision and strategy for change in your nursing practice.

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