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RESEARCH

Newborn Clinical Outcomes of the AWHONN Late Preterm Infant Research-Based Practice Project

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ABSTRACT

Objective: To describe the neonatal health risks (hypothermia, hypoglycemia, hyperbilirubinemia, respiratory distress, the need for a septic workup, and feeding difficulties) experienced by late preterm infants (LPIs) from a large multisite study and determine how these risks were affected by gestational age at birth.

Design: Descriptive analysis of prospective data obtained as part of the AWHONN Late Preterm Infant Research-Based Practice Project.

Setting: Fourteen hospitals located through the United States and Canada.

Participants: Late preterm infants (802) born at gestational ages between 34 0/7 and 36 6/7 weeks.

Methods: Nurses at each site obtained consent from the mother of the infant. The data about the infant were gathered from the infant's medical record.

Results: Thirty-six percent of LPIs were initially cared for in a special care nursery; approximately one half of these infants were eventually transferred to a well-baby nursery. Of the 64% of LPIs initially cared for in a routine nursery, 10% were transferred to a special care unit or neonatal intensive care unit (NICU). More than one half of LPIs experienced hypothermia, hypoglycemia, feeding difficulties, hyperbilirubinemia, and respiratory distress and/or needed a septic workup. The risk for these problems was higher in infants of younger gestational ages. Thirty-two percent of the infants were bathed during the first 2 hours of life, and by 4 hours, more than two thirds had had their first bath. Fifty-two percent received kangaroo care during the first 48 hours of life.

Conclusion: These findings support those of smaller studies indicating that LPIs are at high risk for developing health problems during their neonatal hospitalization. Nurses may be able to ameliorate some of these health problems through early identification of problems and simple, inexpensive interventions such as avoiding early bathing and promoting kangaroo care.

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More than 477,000 late preterm infants (LPIs), those born between 34 and 36 6/7 weeks gestational age, are born to U.S. mothers each year (Hamilton, Martin, & Ventura, 2010). These infants account for 71% of premature births and 8.7% of all births in the United States (Hamilton et al.). Because many LPIs have birth weights of more than 2.5 kilograms, and most are discharged within 4 to 12 days after birth (Pulver, Denney, Silver, & Young, 2010), parents and health care providers may not recognize that they are less neurologically and physiologically mature than full-term infants (Barros, Mitsuhiro, Chalem, Laranjeira, & Guinsburg, 2010; Tomashek et al., 2006; Wang, Dorer, Fleming, & Catlin, 2004).

Late preterm infants experience more medical complications after birth than full-term infants (Consortium on Safe Labor, 2010; Kitsommart et al., 2009; Pulver et al., 2010), and 36% to 56% of LPIs need neonatal intensive care compared to only 5% to 7% of full-term infants (Consortium on Safe Labor; Ishiguro, Namai, & Ito, 2009; Lubow, How, Habli, Maxwell, & Sibai, 2009). The mortality rate for LPIs is also higher than that of full-term infants (MacDorman, Martin, Mathews, Hoyert, & Ventura, 2005). Late preterm infants have been found to be at least 4 times more likely than full-term infants to have a diagnosed postnatal medical problem (Raju, Higgins, Stark, & Leveno, 2006; Shapiro-Mendoza et al., 2006), including

Study results demonstrate the neonatal health risks experienced by late preterm infants and how these risks were affected by gestational age at birth.

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respiratory distress or apnea requiring oxygen or mechanical ventilation (Colin, McEvoy, & Castile, 2010; Dimitriou et al., 2010; Ishiguro et al.; Kitsommart et al.; Lubow et al.), hypothermia (Dimitriou et al.; Engle, Tomashek, & Wallman, 2007; Raju et al.), sepsis (Cohen-Wolkowiez et al., 2009; Picone & Paolillo, 2010; Refuerzo et al., 2010), hypoglycemia (Ishiguro et al.), and hyperbilirubinemia (Adamkin, 2009; Dani, Corsini, Piergentili, Bertini, Pratesi, & Rubaltelli, 2009; Dimitriou et al.; Lubow et al.; Picone & Paolillo). In a national prospective study, the respiratory problems of LPIs had diverse causes, including respiratory distress syndrome (43%), meconium aspiration (9.7%), transient tachypnea of the newborn (3.9%), idiopathic persistent pulmonary hypertension (3.2%), and blood or amniotic fluid aspiration (2.3%; Clark, 2005). The rate of complications increases with decreasing gestational age at birth such that 34-week infants are at greater risk than 36-week infants (Bastek et al., 2008; Lubow et al.; Shapiro-Mendoza et al.).

As a result of these medical complications, LPIs average longer neonatal hospitalizations (4–12 days) than healthy full-term infants (2 days) and have more frequent and longer rehospitalization in the first years of life (Gunville et al., 2010; Lubow et al., 2009; Pulver et al., 2010). Jaundice and sepsis are the most common diagnoses leading to rehospitalization in the neonatal period (Adamkin, 2009; Engle et al., 2007; Jain & Cheng, 2006), and respiratory and digestive illnesses, including gastroesophogeal reflux, are the most common causes of rehospitalization later in the first year (Gunville et al.; McLaurin, Hall, Jackson, Owens, & Mahadevia, 2009). More than 30% of LPIs experience feeding difficulties that may lead to dehydration, hyperbilirubinemia, and rehospitalization (Adamkin; Dimitriou et al., 2010; Lubow et al.; Wang et al., 2004).

Thus, the risks associated with late preterm birth should not be underestimated. However, the full risk of morbidity for LPIs has not been definitively established because most studies have been conducted at a single institution (Dani et al., 2009; Dimitriou et al., 2010), focused on single clinical problem such as multiple births (Refuerzo et al., 2010) or respiratory illnesses (Consortium on Safe Labor, 2010), or were retrospective database studies (Shapiro-Mendoza et al., 2006). Therefore, the purpose of this study was to describe the neonatal health risks (specifically, hypothermia, hypoglycemia, hyperbilirubinemia, respiratory distress, the need for a septic workup, and feeding difficulties) experienced by LPIs from a large multisite study and determine how these risks were affected by gestational age at birth. Infant data were collected as part of the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) Late Preterm Infant Research-Based Practice Project. The goal of this project was to study the effectiveness of a comprehensive evidence-based clinical practice guideline focused on nursing assessment and care for LPIs in the neonatal period. This guideline was developed through an extensive review of the scientific evidence (AWHONN, 2010) and was based on AWHONN's Optimizing Care for Near-Term Infants Conceptual Model (Medoff-Cooper, Bakewell-Sachs, Buus-Frank, Santa-Donato, & Near-Term Infant Advisory Panel, 2005).

The model and the evidence-based guideline integrated the concepts of neonatal physiologic functional status, nursing care practices, care environment, and the essential role of the family in the hospital and beyond to promote healthy outcomes in LPIs. For this project, LPIs and their mothers were recruited from 14 hospitals located in the United States and Canada resulting in a large and geographically diverse sample in which to study the risks associated with late preterm birth.

Methods

Sample

As part of the AWHONN Late Preterm Infant Research-Based Practice Project, data were collected on 931 infants. For 802 of those infants, data were complete and included in the final data analyses. Inclusion criteria included the following: singleton or twins, appropriate for gestational age (between 10th & 90th percentile on growth chart), enteral feeds within first 24 hours, and consent obtained. Exclusion criteria included the following: triplets and beyond; less than 10th percentile on weight; greater than 90th percentile on weight; mechanical ventilation or continuous positive airway pressure (CPAP); diagnosed syndrome affecting neuro-developmental outcomes; major, life-threatening congenital anomaly; or requirement for surgical treatment.