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Risk Assessment Strategy for Late Preterm Infants

Nisha Nair
Californnia State University, Fresno, nishanair@hotmail.com

Constance Hill
San Jose State University, constance.hill@sjsu.edu

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Abstract
Late preterm infants (LPIs), born between 34 and 36 6/7 weeks gestation, face many challenges. These infants comprise 71% of preterm births and 8.7% of all births in the United States (Hamilton, Martin, & Ventura, 2010). They have a higher incidence of medical complications than their full-term counterparts leading to longer hospital stays or readmissions (Consortium on Safe Labor, 2010; Khashu, Narayanan, Bhargava, & Osiovich, 2009; Pulver et al., 2010). The nurse's role in educating parents of LPIs is pertinent as these babies are at heightened risk for a number of significant complications. The purpose of this project is to determine if adopting an evidence-based parent teaching model of care will improve clinical outcomes, build parents' skills and self-confidence in caring for their LPIs at home, and reduce hospital readmissions. "Late Preterm Infants: What Parents Need to Know," a free patient education brochure, which is available in English and Spanish from Association of Women's Health, Obstetric and Neonatal Nurse's LPI Initiative. The parents were given a pre and post questionnaire on the material presented in the teaching. Follow-up phone calls were made to collect data regarding emergency room visits or hospitalizations to the mother at 1 month from the discharge date.Even though there were no readmissions between the two groups, the study shows a significant gap in the parental knowledge in taking care of these infants. Hence, this researcher felt the implementation of a LPI teaching tool ensures care is evidence-based and provides a framework for measuring patient outcomes.

Keywords
Late preterm, teaching model, readmission

Risk Assessment Strategy for Late Preterm Infants

Late preterm infants are at heightened risk for a number of significant complications that make them a vulnerable population. During the first year of life, LPIs are two to three times more likely to die than full term infants (FTIs), attributable in part to potentially preventable causes, such as accidents, influenza, pneumonia, and septicemia (Engle et al., 2007; Wang et al., 2004). Furthermore, LPIs exhibits an increased risk for morbidity (Lubow, How, Habli, Maxwell, & Sibai, 2009; McIntire & Leveno, 2008; Shapiro-Mendoza et al. 2008; Wang et al., 2004) and mortality (Kramer et al., 2000; Santos et al., 2008; Tomashek et al., 2007; Young et al., 2007) in comparison with FTIs. There is profound economic impact of these late-preterm birth on the initial and later hospitalization costs, and on the long-term health effects that require early intervention and other medical and social services (Moster, Lei, & Markestad, 2008; Petrini et al., 2009). King, Gazmararian, and Shapiro-Mendoza (2014) found that target focused interventions are needed to reduce the mortality among these infants. These infants require diligent evaluation, monitoring, referral, and early return appointments, not only for post neonatal evaluation but also for continued long-term follow-up. The goal of this project is to empower parents with increased care knowledge regarding their LPIs based on the best available evidence and recommendations.

Current practices have not fully captured the important information essential for the care of the LPI at home. To remedy this, an evidence-based parent teaching model of care is used to meet the special health care needs of their LPIs. The project explored the benefits of individualized teaching instruction to improve the clinical outcomes and reduce LPI readmissions and ED utilizations.

Project Design

A pilot randomized control trial was used for this quality improvement project. The trial was designed to test a primary hypothesis that first-time mothers with late preterm babies who receive LPI education will identify risk factors, thus minimizing the risk for rehospitalization and utilization of EDs than a matched control group who received usual postpartum teaching. To test the hypothesis, 30 parents of LPIs were selected in this quality improvement pilot study.

Fifteen mothers who had no previous experience in taking care of premature infant were selected for receiving one-to-one instruction regarding the "Late Preterm Infants: What Parents Need to Know," (henceforth known as the Parent Brochure) a free patient education brochure. The brochure informs parents about breathing, temperature control, feeding, sleeping, jaundice, and infections. It also provides questions to ask the baby's health care provider before leaving the hospital. A questionnaire was used to assess the parental knowledge regarding the risks associated with LPIs. The questionnaire was given immediately before and immediately after the one-to-one instruction session. Participants also completed a brief demographic survey. Follow-up was done to collect data regarding ED visits or hospitalization by phone calls to the mother at one month from the discharge date. The 15 first-time mothers in the control group received the usual postpartum standard of care teaching, which does not include instruction using the Parent Brochure. The control group also received the demographic survey, as well as telephone follow-up after 30 days from discharge to review the health of the newborn. The control group was asked the same questions as the intervention group.

Setting

The setting for this project was an academic-affiliated medical center with a Level III Nursery in central California. Approximately 7,000 babies have been born at this center, making

it one of the largest birthing centers in California, capable of conducting high-risk deliveries. Additionally, the medical center has an 84-bed level III NICU, treating more than 1,500 infants per year. This facility practiced a family-centered couplet care with a normal, well-newborn nursery. Direct patient care was provided by registered nurses and patient care assistants.

Population and Sample

The study sample comprised 30 parents of LPIs chosen from the postpartum unit from October 2013 to March 2014. Participants were recruited within 24 hours from childbirth. Potential participants were approached for enrollment after an uninvolved third party (e.g., staff nurse, patient care assistant) obtained their agreement to be contacted. Parents or caregivers were provided with an informational packet, including consent information, notice of privacy practice, and data utilization prior to inclusion to participate in the study (if patient meets all other eligibility criteria). The study was explained to the participants in detail and written informed consent was obtained from mothers if they met the eligibility criteria.

Both primiparas and multiparas were recruited. Eligibility to participate in the study included English speaking, parents of singleton or twins, appropriate for gestational age (between 10th & 90th percentile on the growth chart), enteral feeds within first 24 hours, and with consent. Mothers were 18 years of age or older. Exclusion criteria included: parents with history of LPIs; parents of triplets and beyond; less than 10th percentile on weight; greater than 90th percentile on weight; mechanical ventilation or continuous positive airway pressure (CPAP); major, life-threatening congenital anomaly, or requirement for surgical treatment; and parents who do not speak and read English. Data were collected during the postpartum hospital stay and again at 4 weeks postpartum. At 4 weeks participants were contacted by phone for follow up.

Participants were randomly assigned to either the intervention group or the control group using consecutively numbered, sealed, envelopes on their admission to the postpartum floor. To ensure the availability of an audit trail, the envelope number was recorded on a master information sheet that included the participant's name, telephone number, group assignment, and trial enrollment date. Recruitment was conducted on a daily basis from Monday to Thursday each week so that the intervention could be delivered Monday to Friday. Because the researcher was solely recruiting participants and administering the one-to-one instruction, the Monday-to-Friday schedule was anticipated to be reasonable for the 6-month trial.

Instrumentation

A data collection tool was used to gather maternal and infant information including: parental age and gender, grade level, marital status, ethnicity and employment status. The questionnaires were designed to require a low level of literacy and relatively little time to complete. A standardized Infant teaching plan is currently used for all infants regardless of gestational age at this medical center. There was no written information specific to the needs of the LPIs and their caregivers. Some of the information that was important to be taught to the parents of LPIs included follow-up appointments within 2-3 days of discharge, frequent feedings, identification of risk factors, and close observation for illness cues. By adding specific LPI teaching brochure to the current Instruction form, this researcher envisioned the implementation of an educational tool specific to the teaching needs of LPIs and their parents.

Parents on intervention group received teaching from the researcher regarding LPI care, observance of illness cues, and when to notify their primary care provider of concerns or problems. The parents were also instructed to ensure that follow-up appointments were set up prior to discharge and they had all of their questions answered to their satisfaction. Pre and

posttests were also conducted to assess the teaching effectiveness. The test questionnaire used for this study was developed by the researcher. The questions were in a consistent order and the answers were limited to yes or no responses. A scripted phone call was done for the follow-up on the outcome.

Data Collection

Data were collected at two time points following infant delivery: during maternal hospitalization and at 1 month after mother's hospital discharge. A chart review was done for participant selection after obtaining permission from Medical Records and the Information Systems Department. A list of all infants 34 0/7 weeks to 36 6/7 weeks gestation who were readmitted to a postpartum unit from October, 2013, to March, 2014 was reviewed. Questionnaires were administered to the 15 parents who received parental teaching immediately before and after the education session by the principal investigator. Approximate time for the teaching was 15 minutes. Follow-up phones call were made by the principal investigator to collect data regarding ED visits or hospitalization at 1 month from the discharge date. The follow-up phone call was based on the phone script and no questionnaire was used during the phone call. Attrition was a threat and the following telephone strategies were employed to encourage high retention rates. The participants were telephoned during their stated "best time to contact" periods and messages were left. Directory assistance was telephoned for all disconnected and wrong numbers. All data were collected by this researcher.

Ethical Consideration (Human Subject Protections)

The study posed minimal to no apparent physical, psychological, economic, or social risk to the participants. Prior to data collection, approval was obtained from State University as well as the institutional; Institutional Review Board (IRB).Only the researcher had access to the

names of subjects, which were kept in a locked drawer. Any electronic records or computer files were password protected. All data were reported as aggregate data only and subjects did not receive payment or other reimbursement for participation in this study.

There were no known risks of participating in this trial. As per inclusion and exclusion criteria, study participants were noncritically ill individuals of childbearing age over 18 years (anticipated range: 18-45 years) and their noncritically ill infants without major congenital or fetal anomalies. Participants in both groups received access to all standard postpartum and newborn care in hospital and the community following delivery of their infants. No treatment or supportive interventions were withheld from either group of participants. Parents were informed to withdraw from study at any time if they felt uncomfortable.

RESULTS

In total, 152 women with LPIs were assessed for eligibility during the study period of October 14, 2013, to March 23, 2014. Most of the women did not meet the eligibility criteria. The most common reasons for exclusion included non-English speaking and prior experience in taking care of preterm babies. All the eligible participants agreed to participate in the study, thus the acceptance rate for enrollment in this pilot trial was 100%. Because this was a pilot trial, it primarily focused on examining the feasibility of and compliance with the trial protocol and the acceptability of the teaching intervention. Data were collected at baseline during maternal hospitalization and 4 weeks postpartum.

Data Analysis

Cross tabulation, followed by Fisher's Exact Test, were implemented to compare the number of LPIs who utilized ED and readmissions. Contingency tables were used to summarize and organize all other pertinent data. Descriptive and inferential statistics were used to determine

the effect of an educational program on self-efficacy of parents of LPIs. Results from the pretest and posttest scores of the questionnaire were analyzed. A paired samples *t*-test was conducted to evaluate whether patients' levels of knowledge increased following the 15-minute teaching session. Looking specifically at the five dimensions of the questionnaire, a significant increase between pre- and post-test scores is apparent.

No readmissions were reported within the groups. Ninety percent of participants stated that they were keeping up with regular appointments with their pediatricians. A higher compliance rate of regular follow-ups may have been the reason behind the lack of readmissions. However, there was one case of an emergency visit among the control group. It is noteworthy to point out the existence of utilization of ED even with in small sample size of the study groups. Jaundice was the reason for the emergency visit by the participant in the control group. Shorter length of stay may have provided less time for the bilirubin level to peak prior to discharge.

In order to better understand the parental knowledge regarding late preterm birth, perinatal course, and developmental outcome, correlations were computed to examine the knowledge level regarding respiratory, feeding, thermoregulation, hyperbilirubinemia, and infection. Of the 15 correlations computed, 4 were statistically significant. There were positive moderate correlations between identification of risk factors, especially regarding the jaundice and infection. Therefore, further investigation of these aspects leading to readmissions and utilization of ED visits may be necessary.

Overwhelmingly, the majority of participants reported that the support they received from the researcher increased their confidence in taking care of their LPIs. The participants used general terms, such as being provided with "extra information," "advice," "opportunities to answer questions," "teaching," "a second opinion," "reassurance," "extra support,"

"encouragement," and "helpful suggestions" to describe strategies that increased their confidence.

Implications for Nursing Practice

Late preterm birth, overall, has long been associated with increased neonatal mortality and morbidity (Goldenberg & Rouse, 2013; Honein et al., 2008; Mathews & MacDorman, 2010). The present study explored the importance of parental education of LPIs in an attempt to better understand their developmental course. Within the late preterm population, education has primarily focused on the immediate risks of morbidity and mortality. Mothers of these infants should receive more parental education, and discharge with a more individualized plan, will definitely result in more positive results.

The findings of this study suggest that nurses need to examine the barriers that exist to create standardized interventions/protocols within their practices in order to ensure the best care for all LPIs. In addition, nurses, especially nurse leaders, and physicians need to be familiar with and understand current research about preterm care that promotes optimal outcomes. Circulating current research and professional nursing journal articles could be one method of providing such information. Staff development efforts that increase the knowledge level could prevent excessive or unnecessary patient transfers and keep the mother/baby couplet together until discharge. Also, creating a collaborative environment in which nurses and physicians discuss changing practice could improve care for LPIs.

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