Journal of Neonatal Nursing (2016) 22, 16–20

www.elsevier.com/jneo

The prevalence of neonatal morbidities associated with late-preterm birth

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Available online 21 June 2015

KEYWORDS
Late;
Preterm;
Birth;
Neonatal;
Morbidity;
Prematurity;
Outcomes

Abstract *Objective:* Obstetrical and medical complications in pregnancy may necessitate delivery between 34 and 37 weeks' gestation. To assist decision making and patient counseling, we sought to determine the prevalence of neonatal morbidities between 34 and 37 weeks' gestation.
Study design: Retrospective cohort study of live births was conducted at our institution over a seven year period. Multiple gestations and congenital anomalies were excluded. The prevalence of neonatal morbidities between 34 and 37 were calculated.
Results: 1060 births between weeks 34–36 and 975 births occurred during week 37. Gestational age was inversely related to NICU admission, days in NICU, intubation, poor feeding, hyperbilirubinemia, and respiratory distress ($p < 0.01$ for all). Respiratory distress requiring surfactant (RDS), occurred in 4%, 1%, 0.2%, and 0% of infants born at 34, 35, 36, and 37 weeks, respectively ($p < 0.01$).
Conclusion: There is decreased neonatal morbidity for each week gained between 34 and 37 weeks' gestation.

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http://dx.doi.org/10.1016/j.jnn.2015.06.002
1355-1841/

Introduction

Over the past decade, studies have clearly demonstrated higher morbidity and mortality rates for infants born late-preterm (34 0/7 to 36 6/7 weeks) compared to those born at term (Lubow et al., 2009; McIntire and Leveno, 2008; Khashu et al., 2009; Wang et al., 2004). The closer the fetus gets to term, the lower the risk of complications associated with prematurity. This is in large part the rationale for recommending elective delivery at or after 39 weeks of gestation (ACOG, 2013a).

As opposed to elective deliveries, indicated deliveries occur when there are specific obstetrical or medical complications that pose enough risk to the mother or fetus that necessitates recommending delivery prior to 39 weeks' gestation. The American Congress of Obstetricians Gynecologists, National Institute of Child Health and Human Development and the Society for Maternal-Fetal Medicine provided guidelines for the timing of delivery for indicated late-preterm and early-term births (Spong et al., 2011; ACOG, 2013b). These guidelines provided a framework for clinicians to use to plan delivery for patients with complications such as preeclampsia, placenta previa, oligohydramnios, amongst other. The suggested gestational age for delivery varies depending on the complication (Table 1).

Because of the data showing decreased neonatal morbidity and mortality with advancing gestational age and the aforementioned guideline for the timing of indicated late-preterm and early term birth, it is important to have neonatal data to use for patient counseling and in clinic decision making. This is especially pertinent when establishing a specific delivery date between 34 and 37 weeks of gestation.

The primary objective of this study was to establish the prevalence of neonatal morbidities and mortalities of infants born between weeks 34, 35, 36, and 37.

Table 1 Some medical indications for delivery between 34 and 37 weeks of gestation.

Condition	Suggested gestational age for delivery
Placenta previa	36–37 weeks
Suspected accreta	34–35 weeks
Prior classical delivery	36–37 weeks
IUGR with concurrent conditions	34–37 weeks
Oligohydramnios	36–37 weeks
Chronic hypertension – difficult to control	36–37 weeks
Diabetes – gestational poorly controlled on medications	34–39 weeks

Methods

We analyzed deliveries at Los Angeles County + University of Southern California (LAC + USC) Medical Center between January 1, 2001 and December 31, 2007. All liveborn singleton infants 34 0/7–37 6/7 weeks gestational age were included. We excluded multiple gestations, intrauterine fetal demise, and any infant with a known congenital anomaly. Data included maternal characteristics, such as age, gravidity, parity, mode of delivery, maternal medical conditions, such as diabetes and hypertensive disorders, as well as birth outcomes, such as birth weight and Apgar scores. Neonatal complications, including respiratory distress syndrome (RDS), sepsis, necrotizing enterocolitis, and the need for resuscitative measures were obtained from the Neonatal Intensive Care Unit (NICU) database. The criteria for NICU admission at LAC + USC Medical Center includes birth weight <2250 gm, gestational age <34 weeks, feeding intolerance, signs or symptoms of infection, congenital anomalies, cyanosis or suspected congenital heart disease, hypoglycemia, neonatal depression, maternal HIV, or maternal diabetes. Infants not admitted to the NICU were assumed to not have the aforementioned diagnoses and medical problems. Maternal labor and delivery data were analyzed retrospectively from a single database. Maternal characteristics included age, gravity, parity, and mode of delivery. Respiratory distress was defined as infants requiring any type of respiratory support, including nasal cannula, bag/mask ventilation, or intubation and ventilation. Respiratory distress syndrome (RDS) was defined as the need to administer surfactant. The frequency of neonatal complications was calculated by gestational age week. Statistical analyses were performed using Chi-square tests, and by parametric and non-parametric one way analysis of variance, as appropriate. A p-value <0.05 was considered statistically significant. This study was approved by our local Institutional Review Board.

Results

Among 10,671 singleton deliveries meeting our criteria between 2001 and 2007 – 1060 were late-