The Late-Preterm Infant

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Objectives

• Identify the unique challenges late pre-term infants face following delivery.

• Recognize long-term implications of late pre-term birth on future growth and development.

• Develop reasonable treatment strategies for the late pre-term baby.

Definition

Over 70% of all preterm births are late preterm (34-36 weeks gestation)

US Late Preterm Live Births: Percent Change 1992-2002
Late-Preterm Infant

- Increased fetal surveillance /interventions
- Gestational age estimations
- Presumption of maturity at 34 weeks
- Multiple gestations and artificial reproductive technology
- Maternal health & demographics
- Maternal autonomy
- Physician practice patterns, legal risks

Demographic Characteristics of Populations at Risk for Preterm Birth

- Maternal age (<18 and >35 years)
- Low socioeconomic status (SES)
- Unmarried
- African-American ancestry

Clinical Indications for Preterm Deliveries

- Preeclampsia 43%
- Fetal distress 28%
- Inadequate intrauterine fetal growth 10%
- Abruption 7%
- Fetal demise 7%

Morbidity and Mortality

90 weeks Gestation

Fig 1. Scatterplot of neonatal gestational age versus length of hospital stay

Morbidity during birth hospitalization among late preterm and term infants


Engle, W. A. NeoReviews 2009;10:e280-e286
Infant Mortality Rates and Late Preterm Infants 2004

<table>
<thead>
<tr>
<th>Gestational Age (weeks)</th>
<th>Infant Mortality (per 1000 live births)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;32</td>
<td>182.45</td>
</tr>
<tr>
<td>32-33</td>
<td>16.06</td>
</tr>
<tr>
<td>34-36</td>
<td>7.32</td>
</tr>
<tr>
<td>37-41</td>
<td>2.39</td>
</tr>
<tr>
<td>42+</td>
<td>2.87</td>
</tr>
</tbody>
</table>

Late Preterm Infant-Resp

Jaundice

Zhang et al J of peds 2009


Adverse Outcome Early Term

Table II: Adjusted odds ratios for infant mortality by gestational age in completed weeks

<table>
<thead>
<tr>
<th>Gestational age</th>
<th>Rate per 1000</th>
<th>Adjusted OR (95% CI)</th>
<th>Rate per 1000</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 weeks</td>
<td>0.66</td>
<td>1.00 (0.72-1.00)</td>
<td>1.68</td>
<td>1.00 (0.64-1.00)</td>
</tr>
<tr>
<td>38 weeks</td>
<td>0.42</td>
<td>1.00 (0.74-1.00)</td>
<td>1.79</td>
<td>1.00 (0.65-1.00)</td>
</tr>
<tr>
<td>39 weeks</td>
<td>0.33</td>
<td>1.00 (0.75-1.00)</td>
<td>1.80</td>
<td>1.00 (0.65-1.00)</td>
</tr>
<tr>
<td>40 weeks</td>
<td>0.34</td>
<td>reference</td>
<td>1.03</td>
<td>reference</td>
</tr>
<tr>
<td>41 weeks</td>
<td>0.42</td>
<td>1.00 (0.75-1.00)</td>
<td>1.94</td>
<td>1.00 (0.65-1.00)</td>
</tr>
<tr>
<td>42+ weeks</td>
<td>0.43</td>
<td>1.00 (0.75-1.00)</td>
<td>2.04</td>
<td>1.00 (0.65-1.00)</td>
</tr>
</tbody>
</table>

Jaundice rates were estimated from the logistic regression model adjusted for sex, race, maternal age, education, marital status, smoking, diabetes, chronic hypertension, gestational age, birth weight, and placental weight in the second trimester.

% The last digit of infants who survived the second period.

Respiratory Distress Syndrome

- RDS-Common cause of morbidity
- Male predominance
- Low gestational age
- Maternal diabetes
- Perinatal Asphyxia

Respiratory Distress

- Transition delayed
  - TTN
- Functional deficiency in surfactant
  - RDS

Apnea

- Apnea of Prematurity
  - Present in nearly 100% 28 wks or less gest
  - Present in 4-7% late preterm
  - < 1-2% term infants

Apnea

- Apnea of Prematurity
  - Increased susceptibility to hypoxic resp depression
  - Decreased central chemo sensitivity to CO2
  - Increased sensitivity to laryngeal stimulation
  - Immature pulmonary irritant receptors
  - Decreased upper airway dilator muscle tone
  - CNS immaturity
Temp Regulation
- Decreased brown and white fat
- Immature hypothalamic function
- Low concentrations of hormones responsible for brown fat metabolism
- Larger surface area

Hypoglycemia
- Correlated inversely with gest age
- Immature
  - hepatic glycogenolysis
  - Adipose tissue lipolysis
  - Gluconeogenesis

Late-Preterm Infant
- Infection
  - Intermediate with regard to immunologic maturity
  - Maternal infection may induce preterm labor

Feeding
- Feeding behavior and GI function are immature
  - Low oromotor tone
  - Uncoordinated suck-swallow-breathe
  - Inability to handle volume of fluid needed

Brain Development
- Progresses through fetal and childhood period
- Weighs 2/3 of term infant
- Fewer gyri and sulci
- Less myelinated
Outcome-Long term

Re-hospitalization

- Tomashek et al, late preterm infants 2x more likely to be readmitted.
- Most common diagnoses
  - Jaundice
  - Rule out sepsis
  - Feeding difficulties
  - Failure to thrive
  - ALTE
Management

52 weeks gestation

The Late Preterm Infant

Management

- Community hospitals are important
- 3024 community hospitals in US deliver babies
- 241 academic medical centers with deliveries*
- Often cared for by pediatricians in term nurseries; more prone to clinical problems related to delayed transition
- Transitional care requires higher level of monitoring and support

* AHA 2005

Management

• < 35 weeks gestation
  - Special care nursery
  - Monitored with CRM and Pulse Oxymetry
  - Feedings initiated slowly
  - VS q4h/POC Glucose every shift/BP q day

Management/Take Home Points

• > 36 weeks
  - Admitted to normal nursery if stable

The Late Preterm Infant

Recommendations

• Thermoregulation
• Jaundice
• Sepsis
• Respiratory Distress
• Feeding Problems

Management

• 35 0/7 to 35 6/7 weeks
  - Transition in special care nursery
  - Transferred to normal nursery if:
    • Stable temp
    • Normal POC glucose
    • Normal vital signs
Thermoregulation

- Maintain thermo-neutral temp
- Skin to skin
- Isolette
  - Only if unable to maintain temperature

Jaundice

- Check bilirubin total and direct next day of life
- Using transcutaneous bili
- Follow until peaked or decreasing
- Use AAP guidelines
- Close outpatient follow-up

Infection/Respiratory Distress

- Screen for infection
  - CBC and Blood CX if mom had spontaneous labor
- CRM and Pulse Oxymetry in babies <35 weeks

Management

- Feeding
  - Initiate feedings early in infants > 35 weeks
  - Monitor POC glucose
  - May need to gavage feed if stable (Rare)
  - May nurse (may need assistance)

Discharge Criteria

- Stable temperature
- Normal blood sugars
- Successful breast or bottle feeds
- Weight gain esp for 34 week GA
- Elimination
- No resp or cardiac events for 5 days
- Car seat test < 37 weeks or < 2500 grams

Management

- Follow-up 1-2 days