Continuous labor epidural placement trends among parturients

An evidence-based practice project

June 24, 2022
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Background
Childbirth is very common

- An estimated 480 babies are born world-wide every minute!
- Woman may undergo spontaneous labor or have a scheduled induction
  - Reasons for scheduled labor include:
    - Post-term pregnancy
    - Maternal hypertension or diabetes
    - Placental abruption
    - Fetal growth restriction
The laboring process is acutely painful

- Many options are available to alleviate suffering during labor
  - Breathing exercises, analgesics, positioning, distraction, epidural use
- Continuous Labor Epidurals (CLE) are the gold standard for pain relief and are commonly used
Background

The laboring process is acutely painful

- Rate of neuraxial analgesia use among laboring women has increased to 71% in recent years (Butwick 2018)
- Best practice guidelines: a laboring woman can have an epidural placed as soon as one is requested
- The rate of CLE use, time-to-placement, and associated factors are unknown in two hospitals in Eastern Washington
Purpose

Describe labor epidural placement trends between 2014 – 2020 among women admitted for scheduled induction or spontaneous labor at two hospitals in Eastern WA.
Methods
Retrospective Data Extraction

Interdisciplinary approach

Nurse Anesthetists, Nurse Scientist, and Data Scientists formed a team to answer the question

- Data extraction from electronic health record guided by detailed, evidence-informed protocol
- Data cases were included if:
  - 18 years or older on admission
  - Admitted to one of two hospitals in E WA between 2014 – 2020 for live birth
- Excluded if:
  - Fetal demise
  - Scheduled C-section
Data Points Extracted

- Maternal Age
- Maternal BMI
- Gravida
- Parity
- Scheduled induction flag
- Gestational age
- Amniotomy
- CLE placement flag
- Time from admission to CLE placement
- Time from admission to birth
- Unscheduled C-section flag
Data Analysis

Primary Outcome
- Rate of CLE placement

Secondary Outcomes
- Time to CLE placement from admission
- Factors influencing CLE placement

Univariate
- Frequency Distributions on Categorical Variables
- Descriptive Statistics on Continuous Data

Bivariate
- T-tests
- Mann Whitney U
- Chi Tests

Multivariate
- Kaplan Meier – Time from admission to epidural placement
Results
## Demographics

<table>
<thead>
<tr>
<th></th>
<th>Spontaneous Labor/Nonscheduled (n=14,229)</th>
<th>Scheduled Induction (n=5767)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal Age (years)</strong></td>
<td>Mean (SD) 28.8 (5.34)</td>
<td>Mean (SD) 28.8 (5.32)</td>
<td>0.682</td>
</tr>
<tr>
<td><strong>Maternal BMI (kg/m²)</strong></td>
<td>Median (IQR) 30.6 (27.3 - 34.0)</td>
<td>Median (IQR) 30.9 (28.3 - 35.5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Gestation (weeks)</strong></td>
<td>Median (IQR) 39.2 (38.1 - 40.0)</td>
<td>Median (IQR) 39.4 (39.0 - 40.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Time from Admission to Birth (hours)</strong></td>
<td>Median (IQR) 15.4 (11.2 - 21.8)</td>
<td>Median (IQR) 21.6 (17.2 - 28.4)</td>
<td>&lt;0.001</td>
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<tr>
<td>Demographics Continued</td>
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<thead>
<tr>
<th></th>
<th>Spontaneous Labor/Nonscheduled (n=14,229) N(%)</th>
<th>Scheduled Induction (n=5767) N (%)</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td><strong>CLE placement</strong></td>
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<tr>
<td></td>
<td>7,328 (51.5)</td>
<td>5,005 (86.8)</td>
<td>&lt;0.001</td>
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<tr>
<td><strong>Gravida</strong></td>
<td></td>
<td></td>
<td>0.068</td>
</tr>
<tr>
<td>1</td>
<td>4,057 (28.5)</td>
<td>1,732 (30.0)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4,057 (28.5)</td>
<td>1,551 (26.9)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2,700 (19.0)</td>
<td>1,097 (19.0)</td>
<td></td>
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<tr>
<td>4+</td>
<td>3,415 (24.0)</td>
<td>1,387 (24.1)</td>
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<tr>
<td><strong>Amniotomy</strong></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
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<td></td>
<td>3,771 (26.5)</td>
<td>3,322 (57.6)</td>
<td></td>
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<tr>
<td><strong>Unscheduled C-section</strong></td>
<td>2,191 (15.4)</td>
<td>185 (3.2)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Percent CLE Use from 2014 through 2022 by Gravida

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Time to placement for Spontaneous Labor vs Scheduled Induction

Time from admission to CLE in hours

Spontaneous Labor
- **4.56 (2.27 - 9.38)**

Scheduled Induction
- **8.48 (5.37 - 13.8)**

*P value <0.0001*
Discussion
CLEs were prominent and placed quickly

**Spontaneous labor patients received CLE more quickly**
- Patients with spontaneous labor arrive in pain and are admitted if appearing to be sufficiently dilated
- Patients with scheduled induction are not likely in active labor, thus needing medical intervention to force the body into labor

**CLE's placed most often during day shift hours**
- Increased anesthesia provider staff on day shifts may play a role

**CLE's more prevalent among primiparous versus multiparous patients**
- Labor is often longer among primiparous patients
- Longer labor may contribute to more pain and more time to place a CLE if one is desired
Implications for Practice
Nurses pledge to alleviate suffering
Next Steps

Quality Improvement Projects

• Assess anesthesia provider scheduling especially when scheduled induction cases are high
• Educate nurses and anesthesia staff that patients may have an epidural as soon as requested when admitted for labor
• Implement campaign to ensure patients are offered evidence-based pain management strategies to alleviate labor-related pain
• Investigate ways to document when a patient declines to have a CLE

Continued Data Evaluation

• Extract data to ensure ongoing time-to-placement trends for CLE
• Investigate proportion of cases where epidural is requested, indicated, and delivered over time
• Assess patient-level data such as satisfaction with care as quality improvement projects are put in place
Thank you
References


