Calling urgent and emergent cesarean sections: Are we on time?

Naomi Light, MD1,2; Jessica J.F. Kram, MPH3,4; Kayla Hasel, MPH1,4; Cheryl Bauer, MSN, RN1,5; Mariah Peterson, BSN, RN1,5; Carla Kelly, DO, MMM1,5
1 Department of Obstetrics and Gynecology; 2 Aurora Sinai Medical Center, Milwaukee, WI; 3 Aurora UW Medical Group/Center for Urban Population Health, Milwaukee, WI; 4 Aurora Research Institute, Milwaukee, WI

PROBLEM

Patients with time sensitive cesarean sections include those with an immediate threat to life or those with maternal or fetal compromise that is not immediately life threatening (urgent). Even when a cesarean delivery is deemed emergent or urgent (i.e., time sensitive), patient, anesthesis, and procedure related delays may occur.

BACKGROUND

When a decision for operative delivery in the setting of a Category II fetal heart rate (FHR) is made, American College of Obstetricians and Gynecologists recommends:
- Operative delivery should be accomplished quickly
- Historically a decision to incision time <30 minutes
- To prevent adverse neonatal outcomes
- Ideal decision to incision interval or delivery interval remains controversial as scientific evidence is lacking
- Timing potentially should be individualized based on the clinical picture
- Particular clinical situations may favor faster delivery to prevent adverse neonatal outcomes

- Multiple studies affirm no association of increased adverse outcomes with 30 minute decision-to-incision timeframe.
- 30 minute recommendation was based on a survey of U.S. hospitals who estimated the minimum time required to initiate cesarean delivery given established resources.
  - This time constraint primarily applies to hospitals with full in house staffing capabilities and is limited based on confounding factors (e.g., OR availability)

OBJECTIVE

This quality improvement study aimed to assess whether caregiver education would improve on time cesarean deliveries.

METHODS

Study Design:
- Retrospective study design

Study Population:
- Reviewed all emergent (<15 minutes) and urgent (<30 minutes) patients in one labor and delivery unit
- Emergent and urgent patients six months before and after nursing and provider education were compared
  - Nursing and provider education (9/2017-10/2017) focused on development of communication pathways and orientation to decision making timelines.

RESULTS

- A total of 134 patients were included pre- and post-education (Table 1).

- On univariate analysis, mean time from decision to incision, as well as mean time from decision to anesthesia in patients who didn't already have anesthesia initiated, significantly improved (p<0.01; Figure 1).

- Delays significantly improved (67.1% vs 53.5%; p=0.03; Figure 2), although documented reasons for delays did not (p=0.14; Table 2).

- Overall, only 21.1% of delayed patients (n=199) were emergent cesarean sections.

- Multivariable regression suggested case classification, patient delay, BMI, and time to anesthesia, but not the educational intervention, significantly predicted time to incision (p<0.01; R²=0.86).

CONCLUSIONS

Although an improvement in decision to incision time was observed, it was unrelated to the educational intervention performed.

Concurrent nursing education initiatives aimed at improving cesarean section timing may have contributed to on time deliveries. Ongoing education and team collaboration should continue in order to further improve cesarean delivery timing and patient care.

Table 1: Patient demographics

<table>
<thead>
<tr>
<th>Reason for Delay</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (years)</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>BMI at admission, mean (kg/M²)</td>
<td>34.5</td>
<td>33.7</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>32 (21.48)</td>
<td>34 (18.38)</td>
</tr>
<tr>
<td>African American</td>
<td>84 (56.38)</td>
<td>99 (53.51)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>16 (10.74)</td>
<td>23 (12.43)</td>
</tr>
<tr>
<td>Other</td>
<td>17 (11.41)</td>
<td>29 (15.68)</td>
</tr>
<tr>
<td>Case Classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red (Emergent)</td>
<td>46 (30.87)</td>
<td>53 (28.50)</td>
</tr>
<tr>
<td>Yellow (Urgent)</td>
<td>103 (69.12)</td>
<td>132 (71.50)</td>
</tr>
</tbody>
</table>

Table 2: Time from decision to incision

<table>
<thead>
<tr>
<th>Time from decision to incision</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 min</td>
<td>18.26 (21.76)</td>
<td>13.44 (22.95)</td>
</tr>
<tr>
<td>30 min</td>
<td>35.63 (29.31)</td>
<td>29.31 (26.55)</td>
</tr>
</tbody>
</table>

Figure 1: Mean time in minutes

Figure 2: Was the patient delayed?

Figure 3: Was delay reason documented?