VTE Bundle: Green Journal Discussion

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Rationale for Obstetric Thromboembolism Bundle

• VTE increased 72% during hospitalizations for childbirth between 1998 and 2009 even with increasing use of:
  • Pharmacologic prophylaxis for women with significant risk factors
  • Mechanical prophylaxis for cesarean birth
• Remained relatively constant proportionately as a cause of maternal mortality
• Prevalence of risk factors for thromboembolism is rising due to:
  • Obesity
  • Advanced maternal age
  • Major medical comorbidities
Success in the UK

• Guidance from RCOG supports broad, risk-factor based assessments for both antepartum and postpartum patients

• Under RCOG criteria, women who have undergone cesarean birth and have any additional risk factors are likely to receive pharmacologic prophylaxis

• Results of implementation:
  • 2003-2005: 1.94 deaths per 100,000 births
  • 2006-2008: 0.79 deaths per 100,000 births
  • 2011-2013: 1.01 deaths per 100,000 births
    • Lower than any of the seven periods from 1985 to 2005
National Partnership’s Approach

The National Partnership for Maternal Safety approached the bundle on Venous Thromboembolism with the following in mind:

- Increasing maternal risk of obstetric venous thromboembolism in the U.S.
- Failure of current strategies to decrease venous thromboembolism as a proportionate cause of maternal death
- Observational evidence from the UK that risk-factor based prophylaxis may reduce risk
Risk-based Prophylaxis Reduces Risk

- Consensus-driven bundle to reduce the frequency of obstetric thromboembolism and improve maternal outcomes
- Fundamentally consistent with most current ACCP recommendations for non-pregnant patients
- Strikes an important balance between universal application of the RCOG recommendations and the current standard of care in the U.S. in which pharmacologic thromboprophylaxis is rarely used at this time
Editorial by Drs. Sibai and Rouse

Pharmacologic Thromboprophylaxis in Obstetrics
Broader Use Demands Better Data

• Expressed concern about expansion of pharmacologic prophylaxis based on speculative benefit versus recognized risks and significant cost

• Specific concerns related to:
  • Applicability of the Padua and Caprini scoring systems
  • Quality of evidence to support the use of prophylaxis for antepartum women
  • Duration of prophylaxis for women who had a vaginal delivery
  • Use of pharmacologic prophylaxis after cesarean delivery for women at risk for VTE based on RCOG criteria
  • Risk of Hemorrhage and other complications
A Split Over Pharmacologic Prophylaxis

vs.

Dr. Sibai

Dr. Rouse
A Response to Drs. Sibai and Rouse

• Submitted October 2, 2016 by the bundle committee

• Disagreement is grounded in a fundamental philosophic difference about whether pregnant women ought to be treated like all other categories of adults
A Response to Drs. Sibai and Rouse

• Without large-scale randomized clinical trials, the best available evidence suggests significantly reduced maternal mortality from VTE in the UK with use of broad risk-factor based pharmacologic prophylaxis.

• In the setting of increasing VTE risk in the obstetric population, the question should be which risk factors warrant pharmacologic prophylaxis, not if pharmacologic prophylaxis is warranted.
Comparison of 3 Leading Guidelines

293 patients included in analysis

1% ACOG All based on having a prior event

35% Chest Emergency caesarean, Pre-eclampsia
Obesity, Multiple gestation
Postpartum hemorrhage

85% RCOG Caesarean during labor, Maternal Age ≥35
Obesity, Pre-eclampsia, Infection, High Parity

Hemorrhage Risk

- TIPPS trial
  - RCT of 292 high risk patients randomized to prophylactic dalteparin versus no dalteparin
  - Major bleeding risk: 2.1% vs. 1.4% (3 patients versus 2 patients, p = 1.0)

- Risk greatly exaggerated by Drs. Sibai and Rouse

Rodger et al., The Lancet 2014
### Hemorrhage Risk

**Pulmonary Embolism and Deaths Reported in All Randomized Controlled Trials of Prophylactic Subcutaneous Heparin in General, Orthopedic, and Urologic Surgery.**

<table>
<thead>
<tr>
<th></th>
<th>Nonfatal Pulmonary Embolism</th>
<th>Fatal Pulmonary Embolism</th>
<th>Fatal Hemorrhage</th>
<th>Other or Unknown Causes of Death</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Heparin</td>
<td>Control</td>
<td>Heparin</td>
<td>Control</td>
</tr>
<tr>
<td>International Multicentre Trial</td>
<td>14/2230</td>
<td>19/2250</td>
<td>6/2230</td>
<td>19/2250</td>
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<tr>
<td>Other 1:1 trials*</td>
<td>76/4546</td>
<td>117/4588</td>
<td>13/4136</td>
<td>36/4176</td>
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<tr>
<td>2:1 or 3:1 trials*</td>
<td>15/1103</td>
<td>11/401</td>
<td>0/941</td>
<td>0/351</td>
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<tr>
<td>Totals: all trials</td>
<td>105/7879</td>
<td>147/7239</td>
<td>19/7307</td>
<td>55/6777</td>
</tr>
</tbody>
</table>

**No. of randomized patients for whom data were not available**

- 224
- 245

**Statistical calculations: heparin group†**

- O - E no. of events: -28.1, -18.5
- Variance of O - E: 55.2, 18.2
- Z (P value): 3.8 (<0.0005), 4.3 (<0.0001)
- Typical % reduction in odds (±SD): 40±11, 64±15

*Most trials involved assignment of an equal number of patients to heparin and control groups, a 1:1 ratio, but a few involved a 2:1 or 3:1 assignment.

†O denotes observed, E expected, and NS not significant.

Collins et al., NEJM 1988
Hemorrhage Risk

• Clagett et al. Annals of Surgery 1988
  • Meta-analysis of DVT prophylaxis in moderate- and high-risk general surgery patients
  • Risk of major hemorrhage in low dose heparin vs. controls: 0.33% vs. 0.33%, p = 0.99
Conclusions based on current evidence

We believe the VTE bundle correctly errs on the side of:

- preventing fatal PE and complicated DVTs
- managing the minor bleeding sequelae.
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