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Although guidelines have been created to aid practitioners in the care of patients, these guidelines are based mainly on expert opinion. There are only a few studies in the area of perinatal thromboprophylaxis, and those which exist are small and of low methodological quality.

In an attempt to balance these risks and benefits, and in an absence of robust data, many different sites have implemented different scoring tools in order to properly risk stratify women in the peripartum period. The STEP-UP Tool (right panel) was implemented in VIHA in February 2010, and in the year since its introduction, has screened over 3000 mothers.

In the short period of time since its implementation it is not possible to assess the effects on outcomes due to the low rates of VTE. We therefore are hoping to see if the retrospective application of the tool to historical patients who suffered a VTE would have resulted in appropriate prophylaxis in these patients.

### Introduction

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### Objectives

#### Primary objectives:

- To determine the proportion of patients, who suffered a VTE in association with a pregnancy (from January 1985 – September 2010), who would have received prophylactic therapy with the application of the STEP-UP clinical tool support system.

#### Secondary objectives:

- To compare selected risk factors from the STEP-UP tool to the general population in order to determine the association between these factors and VTE.
- To determine the historical rates of VTE in the Victoria population.
- To compare the VIHA STEP-UP Tool to others clinical support tools from the literature.

### Methods

#### Design

- Observational
- Multi-centred Chart Review
- Retrospective Case Control Study

#### Inclusion Criteria

- The target population includes mothers from Victoria and catchment area who experienced a venous thromboembolism during pregnancy or within 12 weeks of delivery from January 1985 until September 2010
- Reference group inclusion was all births in local area from 2000-2009

#### Exclusion Criteria

- There are no exclusion criteria.

### Results

#### Table 1: Risk Factors for Venous Thromboembolism

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Postpartum VTE Group</th>
<th>Provincial Perinatal Database</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age</td>
<td>(n=47)</td>
<td>(n=28245)</td>
<td></td>
</tr>
<tr>
<td>&lt;25 years</td>
<td>40</td>
<td>21945</td>
<td>0.00 (0.27-1.33)</td>
</tr>
<tr>
<td>25-35 years</td>
<td>7</td>
<td>6400</td>
<td>0.60 (2.27-1.33)</td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td>20.0 - 29.9 kg/m²</td>
<td>41</td>
<td>87.2%</td>
</tr>
<tr>
<td>≥30 kg/m²</td>
<td>6</td>
<td>128</td>
<td>235.3%</td>
</tr>
<tr>
<td>Smoker</td>
<td>No</td>
<td>39</td>
<td>83.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>17.0%</td>
<td>0.13 (0.53-2.43)</td>
</tr>
<tr>
<td>Method of Delivery</td>
<td>Vaginal</td>
<td>20</td>
<td>42.6%</td>
</tr>
<tr>
<td>Cesarean Section</td>
<td>No</td>
<td>25</td>
<td>57.4%</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>3.7%</td>
<td>0.29 (0.04-1.3)</td>
</tr>
<tr>
<td>Multiple Gestation</td>
<td>No</td>
<td>44</td>
<td>93.6%</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>6.4%</td>
<td>0.14 (0.02-0.9)</td>
</tr>
<tr>
<td>PPH</td>
<td>No</td>
<td>31</td>
<td>82.7%</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>17.3%</td>
<td>0.29 (0.04-1.3)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>No</td>
<td>46</td>
<td>97.9%</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>2.1%</td>
<td>0.29 (0.04-1.3)</td>
</tr>
</tbody>
</table>

#### Figure 1: Distribution of VTE Around Birth

#### Figure 2: Number and Rates of VTE

#### Figure 3: Percentage of Patients Who Would Have Received Prophylaxis Based Upon Different Clinical Support Tools

#### Figure 4: STEP-UP Tool

### Discussion

- The rate of venous thromboembolism (VTE) in Victoria ranged between 0.033% and 0.19%, which is within the estimated range in the literature.
- Historically in Victoria, 55% of VTE occurred in the postpartum period and would have been subject to classification with the STEP-UP tool.
- The STEP-UP Tool would have identified 11.5% of all identifiable clots.
- Risk factors which had a statistically significant difference between the patients who suffered a VTE and the control group were as follows:
  - Cesarean section: odds ratio of 2.9 (95% CI 1.62 – 5.16)
  - Multiple gestation: odds ratio of 4.17 (1.29 – 13.49)
  - Postpartum hemorrhage: odds ratio of 2.91 (1.23 – 6.87)
  - BMI greater than 30 was not associated with increased odds ratio 0.35 (0.15 – 0.82)

### Objectives

- Venous thromboembolic events continue to be a significant preventable cause of morbidity and mortality for mothers in the peripartum period as demonstrated by the local rates over the last 25 years.
- This tool would have identified a minority of patients who suffered a VTE in Victoria from 1985-2010 which is contrasted with the superior predictive capability of the Lindqvist (Swedish) tool.
- It is however unknown how selective these tools are.
- Risks associated with thromboprophylaxis was not studied as a result of the nature of this study.
- It must be noted that they are not without risks and inappropriate over-prescribing will result in increases in rates of side effects.
- Recommendations:
  - Continue to screen all postpartum patients and high risk pregnancies.
  - Consider adjustment of thresholds for treatment with STEP-UP tool.
  - Consider short-term (1-2 week) prophylaxis as seen in other tools.
  - Consider adjustment of risk factors to closer match those of other risk tools (Lindqvist Tool).
  - Examine the implications of these adjustments on the general population in terms of: exposure to mothers/babies, harms, and costs associated with the more widespread use of VTE prophylaxis.

### References

Available on request – lyle.powell@viha.ca