What is the risk of venous thromboembolism (VTE) in patients treated by an Outpatient Parenteral Antimicrobial Therapy (OPAT) Service?

David A. Barr; Sharon Irvine; Neil D. Ritchie; Jay McCutcheon; R. Andrew Seaton.
1. VTE prophylaxis is a well established standard of care for hospitalised patients with infections.

2. But, a majority of symptomatic VTE occurs in community setting.


3. And, OPAT reduces frequency and duration of hospital admission for infection. What are implications for VTE prophylaxis for these patients?
Good practice recommendations for outpatient parenteral antimicrobial therapy (OPAT) in adults in the UK: consensus statement

BSAC/BIA OPAT Project Good Practice Recommendations Working Group

“...need to undertake risk assessment for venous thromboembolism in patients undergoing OPAT following an inpatient stay.”

“It is possible that OPAT patients have an increased risk of thromboembolism compared with patients receiving oral antimicrobial therapy in the community... but the magnitude of risk is unknown and thromboprophylaxis in this setting is not supported by any published data.

“Therefore, the group is currently not making a recommendation for the use of venous thromboprophylaxis in patients who are managed via OPAT without prior hospital admission.”
Study aims

1. Find the incidence of VTE in patients treated through the OPAT service in Greater Glasgow and Clyde

2. Find out if a risk assessment score validated for inpatients is useful in predicting VTE risk for OPAT patients
Methods 1

Setting

- Glasgow OPAT service: ID consultant led; approx. 300 patients/year since 2001; all episodes prospectively recorded on electronic database.

Design

- Retrospective cohort study
- Included: all OPAT patient episodes with ≥1 dose parenteral Abx given between May 2009 and May 2012.
- Excluded: Patients on long-term anti-coagulants, those with an established indication for extended, outpatient VTE prophylaxis (i.e. patients referred to OPAT following hip or knee arthroplasty), and those with residence outside GG&C.
Methods 2

Outcome variables

- Primary: incidence of diagnosed VTE during or up to 90 days following discharge from OPAT.
- Secondary: all diagnosed VTE and causes of deaths up to 1 year after OPAT.

Hypothesis and sample size

- Assumed crude VTE incidence up to 90 days of 1.5%, with null hypothesis value 3.0%, power 0.80, alpha 0.05 → 848 patients
- If exclusion rate approx. 10% → 940 patients
Methods 3

Independent variables – Padua risk assessment score

- Data on patient risk factors for VTE at time of commencing OPAT collected to allow retrospective application of the 11 parameter Padua VTE Prediction Score
## Methods

### Independent variables – Padua risk assessment score

<table>
<thead>
<tr>
<th>Baseline features</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer</td>
<td>3</td>
</tr>
<tr>
<td>Previous VTE (with the exclusion of superficial vein thrombosis)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Reduced mobility</strong></td>
<td>3</td>
</tr>
<tr>
<td>Already known thrombophilic condition</td>
<td>3</td>
</tr>
<tr>
<td>Recent (≤1 month) trauma and/or surgery</td>
<td>2</td>
</tr>
<tr>
<td>Elderly age (≥70 years)</td>
<td>1</td>
</tr>
<tr>
<td>Heart and/or respiratory failure</td>
<td>1</td>
</tr>
<tr>
<td>Acute myocardial infarction or ischemic stroke</td>
<td>1</td>
</tr>
<tr>
<td><strong>Acute infection and/or rheumatologic disorder</strong></td>
<td>1</td>
</tr>
<tr>
<td>Obesity (BMI ≥30)</td>
<td>1</td>
</tr>
<tr>
<td>Ongoing hormonal treatment</td>
<td>1</td>
</tr>
</tbody>
</table>

Score ≥ 4  ➔ high risk of VTE
Methods 4

Data sources

- Prospective OPAT database
- National radiology picture archiving & communication system (PACS)
- GG&C laboratory records
- All electronic admission records / discharge summaries
- All letters between primary and secondary care
Results 1

940 patient episodes

160 exclusions
- 84 post hip or knee arthroplasty
- 58 long-term anticoagulant
- 17 resident outside GG&C
- 1 not given any Abx

780 patient episodes included

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin and soft tissue infection</td>
<td>343</td>
<td>44.0%</td>
</tr>
<tr>
<td>Osteomyelitis including discitis</td>
<td>103</td>
<td>13.2%</td>
</tr>
<tr>
<td>Septic arthritis including prosthetic joint or metalwork infection</td>
<td>72</td>
<td>9.2%</td>
</tr>
<tr>
<td>Bacteraemia and endovascular</td>
<td>66</td>
<td>8.5%</td>
</tr>
<tr>
<td>Pulmonary infection</td>
<td>54</td>
<td>6.9%</td>
</tr>
<tr>
<td>Other</td>
<td>142</td>
<td>18.2%</td>
</tr>
</tbody>
</table>
## Results 2

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient admission prior to OPAT</td>
<td>433</td>
<td>55.5%</td>
</tr>
<tr>
<td>Obesity</td>
<td>115</td>
<td>14.7%</td>
</tr>
<tr>
<td>Age &gt; 70 years</td>
<td>100</td>
<td>12.8%</td>
</tr>
<tr>
<td>Surgery within last 1 month</td>
<td>94</td>
<td>12.1%</td>
</tr>
<tr>
<td>Cardiac or respiratory failure</td>
<td>77</td>
<td>9.9%</td>
</tr>
<tr>
<td>Active cancer</td>
<td>35</td>
<td>4.5%</td>
</tr>
<tr>
<td>Current or prior intravenous drug user</td>
<td>26</td>
<td>3.3%</td>
</tr>
<tr>
<td>Prior venous thromboembolism</td>
<td>23</td>
<td>2.9%</td>
</tr>
<tr>
<td>Primary thrombophilic condition</td>
<td>5</td>
<td>0.6%</td>
</tr>
<tr>
<td>Other major comorbidity</td>
<td>201</td>
<td>25.8%</td>
</tr>
<tr>
<td>Padua score &gt; 3</td>
<td>105</td>
<td>13.5%</td>
</tr>
</tbody>
</table>

0/780 patients on pharmacological VTE prophylaxis during OPAT
During or up to 90 days following OPAT:

- 2/780 patients had VTE diagnosed $\rightarrow$ 0.26% (95% CI 0.03% to 0.92%)

- Both patients were ‘low-risk’ (score <4) on Padua risk assessment model on day of commencing OPAT.

- 8 deaths; none suspected to be related to VTE, but one intracranial haemorrhage associated death.
Up to one year after OPAT there were a total of 5 VTEs.
Rate of VTE seen in this cohort is lower than reported in studies of recently discharged medical patients who had been treated for infection. [OPAT selection criteria?]

Extended Prophylaxis for Venous Thromboembolism in Acutely Ill Medical Patients with Prolonged Immobilization (EXCLAIM) study: 90 day VTE rate was 1.1% in the placebo group.

Extended (beyond 5-14 days for inpatients) pharmacological VTE prophylaxis is not licenced outwith very specific post-op groups.
The low rate of VTE found in our cohort suggests that extended VTE prophylaxis in OPAT patients would not be associated with substantive absolute risk difference or net clinical benefit.

OPAT clinicians should be cautious about applying risk assessment scores validated for inpatients in OPAT setting.

Might there be subgroups of OPAT patients who would benefit from pharmacological VTE prophylaxis? Our results suggest very large (multi-centre) prospective studies would be needed to show this.
Conflicts:
I have no disclosures / conflicts of interest. No funding was received for the presented work.

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