CTPA: Can we say no to a raised D Dimer?

Dr E Dempster, Dr D Gunatilleke, Dr U Kumarsena
Queen Elizabeth Hospital, Lewisham & Greenwich NHS Trust

Background
• Queen Elizabeth Hospital introduced a local guideline in 2012 (figure 1) to guide CT pulmonary angiography (CTPA) use in investigation of pulmonary embolism (PE).
• Despite this, radiologists noticed increasing numbers of CTPAs performed which were negative for PE.
• Unnecessary imaging is harmful to patients with contrast and radiation risks and prevents more appropriate use of healthcare worker and CT scanner time.

Objectives
1. Do CTPAs performed comply with the new guideline?
2. What is the positive diagnostic yield and how do we compare to 2012?
3. Consider strategies to reduce the number of negative CTPAs performed.

Methodology
CTPA requests and authorised reports were retrospectively analysed for all CTPAs performed between 1/10/15 - 30/11/15 and comparison made to the 2012 audit.

Results

1. Do CTPAs performed comply with the new guideline?
160 CTPAs performed during audit period:
• 54 High Risk Wells score – 9 positive for PE
• 64 Low Risk Wells score, positive d dimer – 11 positive for PE
• 42 ‘inappropriate’ CTPAs performed – 5 positive for PE:
  • 7 incorrect Wells score recorded on request
  • 14 justified by extenuating circumstances
  • 6 authorized by an outsourced company out of hours

2. What is the positive diagnostic yield and how do we compare to 2012?

<table>
<thead>
<tr>
<th>Audit Cycle</th>
<th>Audit Period</th>
<th>Number of CTPAs performed</th>
<th>Positive Diagnostic Yield for PE</th>
<th>Alternative Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit Result</td>
<td>Meeting audit standard (&gt;15%)?</td>
<td>Audit Result</td>
<td>Meeting audit standard (&gt;50%)?</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>1/10/15 - 31/11/15</td>
<td>160</td>
<td>15.6%</td>
<td>✔</td>
</tr>
<tr>
<td>2012</td>
<td>2/9/12 - 31/10/12</td>
<td>89</td>
<td>22.5%</td>
<td>✔</td>
</tr>
</tbody>
</table>

Age Adjusted D Dimer = age x 10 for patients aged >50
- Has been shown to increase specificity without impacting sensitivity of d dimer when determining clinical probability of venous thromboembolism.
- We investigated this as a method to reduce false positive d dimer results justifying CTPA.
- 66 patients aged >50 with Wells score ≤4 or no score.
- 63 meet current guidelines for CTPA (i.e. d dimer > >270ug/L) despite low Wells Score.
- 42 would be eligible for CTPA if using age adjusted d dimer.
→ 21 CTPAs could have been prevented using this method.
- Of these 21 CTPAs, one confirmed PE.

Conclusions
• A large rise was seen in number of CTPAs performed despite introduction of new guideline.
• Positive diagnostic yield fell but still meets accepted standards.
• Despite the new guideline many inappropriate scans are still being performed.
• Age adjusted d dimer as a method of reducing the number of unnecessary CTPAs may present a promising area for guideline development.

References
[Accessed 25/2/16].

Figure 1: Local guideline for investigation of suspected pulmonary embolism at Queen Elizabeth Hospital introduced in 2012.

Figure 2: Results of CTPAs performed: 15.6% positive for PE, 38.1% normal, 46.3% suggested alternative diagnoses.