Can age stratified D-dimers reduce the number of false positive results in comparison to traditional d-dimer testing in patients aged over 50 suspected of PE?

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August – November 2015

Aim
The aim was to review whether age stratified D-dimers in patients aged over 50 could reduce the number of false positive results from traditional D-dimer testing and therefore reduce the number of unnecessary CTPA carried out.

Method
This was a retrospective study looking back over a 4 month period with a study population of 205 patients aged >50 who had a CTPA undertaken for suspected PE. Each patient D-dimer was reviewed to determine whether this result was correct in diagnosing PE using age stratified and traditional methods. Exclusions were patients <50 years old, with active cancer, currently being treated for VTE or post operative.

Results
Of the 205 patients:
• 38 (18.5%) had a positive CTPA result for PE
• age stratified returned a true positive of 86.8% and false negative of 13.2%
• traditional returned a true positive of 97.4% and a false negative of 2.6%

167 (81.5%) patients had a negative CTPA result:
• age stratified returned a true negative of 72.5% and false positive of 27.5%
• traditional returned a true negative of 9.0% and a false positive of 91.0%.

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<th>Age Stratified</th>
<th>Traditional</th>
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<tbody>
<tr>
<td>True Positive</td>
<td>N=33/38 (86.8%)</td>
<td>N=37/38 (97.4%)</td>
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<tr>
<td>True Negative</td>
<td>N=121/167 (72.5%)</td>
<td>N=15/167 (9.0%)</td>
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<tr>
<td>False Positive</td>
<td>N=46/167 (27.5%)</td>
<td>N=152/167 (91.0%)</td>
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<tr>
<td>False Negative</td>
<td>N=5/38 (13.2%)</td>
<td>N=1/38 (2.6%)</td>
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Age stratified D-dimer:
• sensitivity 86.8%
• specificity 72.4%

Traditional D-dimer:
• sensitivity 97.4%
• specificity 8.9%

Conclusion
Using age stratified D-dimers could lead to less unnecessary CTPAs being carried out in patients aged >50 and be a more specific diagnostic marker than traditional D-dimer methods. Positive predictive values were 41.7% and 19.6% respectively. Both sensitivity and specificity was significantly higher for age stratified d-dimers in comparison to traditional d-dimer tests.

However there was a slightly higher percentage of false negatives whilst using age stratified which could lead to PEs being missed, so clinical judgement would have to be used for each case. Nevertheless this could be a way of saving money and reducing unnecessary radiation exposure.

Recommendations
• A sub group analysis of the false negatives in the adjusted group to see if clinical assessment or any other parameter could be used in order to reduce the incidence of false negatives. e.g. Did they have co existing DVTs?
• Discuss with Biochemist to see whether an elevated D-Dimer result should be accompanied with guidance about age adjusted criteria that will help reduce CTPAs requested.