Novel Screening Tool

for Abdominal Aortic Aneurysms

based on Plasma D-Dimer and Myeloperoxidase

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I have the following potential conflicts of interest to report:

NONE
Neutrophil involvement in AAA

Neutrophil depletion inhibits AAA formation in mouse models

- Eliason et al. Circulation 2005

Neutrophil-released proteases and ROS contribute to media destruction

- Houard et al. FASEB J 2009

Neutrophil myeloperoxidase (MPO) is elevated in blood of AAA patients

Diagnostic marker potential of MPO for AAA compared to the established marker D-dimer

Exploration set:
Plasma measurements of MPO and D-dimer in AAA patients (N=41) and healthy controls (N=38) matched for age, sex, BMI and smoker status

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>1 – Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUC</td>
<td>0.829</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>&lt;0.001</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>1 – Specificity</th>
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</thead>
<tbody>
<tr>
<td>D-Dimer</td>
<td></td>
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<tr>
<td>AUC</td>
<td>0.830</td>
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<tr>
<td>p</td>
<td>&lt;0.001</td>
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</table>
Development of a diagnostic score based on combined D-Dimer and MPO values

Diagnostic linear score derived from the logistic model according to the estimated regression coefficients

\[
\text{SCORE} = -3.442 + 1.375 \times \text{D-dimer} + 0.205 \times \text{MPO}
\]
Validation of the diagnostic score based on combined D-Dimer and MPO values

SCORE predicts probability as $\text{PROB}=1/(1+\exp(-\text{SCORE})$

A simplified classifier: dichotomized SCORE (DICH)

$\text{SCORE} < 0 \ ... \ \text{DICH}=0$
$\text{SCORE} \geq 0 \ ... \ \text{DICH}=1$

<table>
<thead>
<tr>
<th>DICH * Disease Crosstabulation</th>
<th>Disease</th>
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<tbody>
<tr>
<td></td>
<td>healthy</td>
<td>AAA</td>
<td>Total</td>
</tr>
<tr>
<td>DICH 0</td>
<td>Count</td>
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<td></td>
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<tr>
<td>% within DICH</td>
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<tr>
<td>77,8%</td>
<td>22,2%</td>
<td>100,0%</td>
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<tr>
<td>Count</td>
<td>28</td>
<td>8</td>
<td>36</td>
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<tr>
<td>% within DICH</td>
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<tr>
<td>4,3%</td>
<td>95,7%</td>
<td>100,0%</td>
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<td>Count</td>
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<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within DICH</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>49,2%</td>
<td>50,8%</td>
<td>100,0%</td>
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<tr>
<td>Count</td>
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<td>30</td>
<td>59</td>
</tr>
</tbody>
</table>

DICH
- positive predictive value of 95.7% (78.1%-99.9%)
- negative predicted value of 77.8% (60.9%-89.9%)

SCORE
Sensitivity: 73.3% (54.1%-87.7%)
Specificity: 96.6% (82.2%-99.9%)
Acknowledgement

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