Hybrid myocardial perfusion SPECT/CT and invasive coronary angiography in patients with stable angina pectoris lead to similar treatment decisions

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Abstract

Background: To evaluate to what extent treatment decisions for patients with stable angina pectoris can be made based on hybrid myocardial perfusion SPECT (SPECT) and CT Coronary Angiography (CT-A), we performed a study where hybrid SPECT/CT-A was performed prior to CA in all patients. The main outcome measures were the necessity of revascularization (No revascularization versus Revascularization (PCI versus CABG)), the question remains whether these imaging results lead to similar treatment decisions as compared to standalone SPECT and invasive coronary angiography (CA).

Main outcome measures: The study outcome was the treatment decision categorized as: no revascularization or percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). These treatment decisions were made by a panel of two interventional cardiologists and one cardio-thoracic surgeon in two steps: first based on the results of hybrid SPECT/CT-A, and on a second occasion based on SPECT and CA. Percent agreement of treatment decisions were calculated on both diagnostic strategies were calculated.

Results: Revascularization (PCI or CABG) was indicated in 54 (50%) patients based on SPECT and CA. Percent agreement of treatment decisions based on hybrid SPECT/CT-A versus SPECT and CA on the necessity of revascularization (No revascularization versus revascularization) was 92%. Percent agreement for the decisions on the method of revascularization (PCI versus CABG) was 74%.

Conclusions: Panel evaluation shows that patients could be accurately divided for and deferred from revascularization based on hybrid SPECT/CT-A.

Hypothesis

Treatmen decisions could be made for patients with stable angina pectoris based on hybrid SPECT and CA.

Materials and Methods

Imaging

ALL PATIENTS:
- Hybrid myocardial perfusion SPECT and CT coronary angiography
- Invasive coronary angiography

Patient Population (N = 106)

<table>
<thead>
<tr>
<th>Age, yrs ± SD</th>
<th>62 ± 10</th>
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</thead>
<tbody>
<tr>
<td>Gender (M/F)</td>
<td>74/33</td>
</tr>
<tr>
<td>Risk factors</td>
<td>Non-anginal: 1 (0.3)</td>
</tr>
<tr>
<td>Smoking</td>
<td>A-typical: 33 (31)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Typical: 73 (62)</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>Pre-test Probability n (%)</td>
</tr>
<tr>
<td>Family history</td>
<td>Low: 0</td>
</tr>
<tr>
<td></td>
<td>Intermediate: 46 (43)</td>
</tr>
<tr>
<td></td>
<td>High: 56 (52)</td>
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<tr>
<td></td>
<td>Unknown: 5 (5)</td>
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<td>Median: 87</td>
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</tbody>
</table>

Panel evaluation of treatment decision

Panel evaluation of Hybrid SPECT/CT-A

Electroclinal characteristics and stress Echo

Hybrid SPECT/CT-A images

Image evaluation

SPECT only images

Revascularization

Unmatched

Normal

CTA >50% stenosis in coronary and SPECT SDS≥1 in corresponding myocardium

No corresponding abnormalities Both CTA and SPECT normal

Conclusions

• Panel members were very experienced members of routine clinical heart teams, however, they were less experienced with making decisions based on hybrid SPECT-CTA
• Performance of SPECT or CTA as stand alone procedure was not evaluated in the process of decision making
• SDS ≥1 in myocardial territory subtended by one coronary artery as threshold for significant ischemia on SPECT when evaluating the three groups of matched, unmatched and normal findings by SPECT and CTA could be subject to discussion
• Data on clinical benefit of hybrid SPECT/CT-A cannot be obtained from this patient subset since actual therapy was instituted after routine heart team evaluation

References

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Disclosure of Interest: None to declare