Prospective comparison of Cardiac PET/CT, SPECT/CT fusion imaging and CT coronary angiography with Invasive Coronary angiography


The PACIFIC-trial
Declaration of Interest

- I have nothing to declare
Aim of the study

- To determine the diagnostic value, in a true head-to-head fashion, of CCTA, SPECT and PET imaging compared against Fractional Flow Reserve

- To assess whether cardiac hybrid imaging has an incremental diagnostic value over stand-alone imaging
Study design

Day 1
- Scout CT
- Calcium scoring
- 256-slice CTCA
- Resting perfusion
- LD CT
- Stress perfusion
- LD CT
- Stress SPECT
- LD CT

Day 2
- 99m-Tc
- Rest SPECT
- LD CT
- ICA + FFR
- LD CT

Adenosine 140 µg/kg/min

Contrast injection

$^{15}$O$H_2O$

$^{99m}$Tc

VU university medical center
Results - Diagnostic accuracy

<table>
<thead>
<tr>
<th></th>
<th>CCTA</th>
<th>SPECT</th>
<th>PET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>90%</td>
<td>57%</td>
<td>60%</td>
</tr>
<tr>
<td>Specificity</td>
<td>94%</td>
<td>60%</td>
<td>73%</td>
</tr>
<tr>
<td>NPV</td>
<td>89%</td>
<td>84%</td>
<td>89%</td>
</tr>
<tr>
<td>PPV</td>
<td>88%</td>
<td>73%</td>
<td>81%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>88%</td>
<td>89%</td>
<td>85%</td>
</tr>
</tbody>
</table>

Percentage (%)
Results - Diagnostic accuracy hybrid imaging

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>NPV</th>
<th>PPV</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid SPECT/CCTA</td>
<td>50%</td>
<td>74%</td>
<td>97%</td>
<td>92%</td>
<td>97%</td>
</tr>
<tr>
<td>Hybrid PET/CCTA</td>
<td>71%</td>
<td>82%</td>
<td>94%</td>
<td>88%</td>
<td>76%</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>84%</td>
</tr>
</tbody>
</table>
Conclusion

• This first prospective head-to-head comparative trial revealed PET to exhibit the highest accuracy for diagnosis of myocardial ischemia in patients with an intermediate pre-test likelihood.

• A combined anatomical and functional assessment does not add incremental diagnostic value and guides clinical decision-making in an unsalutary fashion.