Ascending Aortic Aneurysms Are Over-Diagnosed Using Cardiology Guidelines: When Is The Ascending Aorta Really Aneurysmal

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Background

• A clear definition of thoracic aneurysms is missing
• Cardiologists define ascending aortic ectasies as ascending aorta ≥40 mm
• If so, surveillance is recommended
• However, the size of ascending aorta has shown to be strongly associated with age, sex and body size.

Aims

• Describe the prevalence and diagnostic accuracy of ascending aortic ectasies and aneurysms using absolute measurements compared to relative size

Methods and material

• Population-based non-contrast CT scanning in 11 190 individuals (93.4% male, age 69.5±2.7 yrs)*
• A subgroup of 291 had a transthoracic echocardiography performed.

CT versus echocardiography

CT measured larger diameters than US:
2.3 mm (95% CI: 2.1-2.6)
All CT-based diameters were converted to corresponding echocardiographic measurements by the mean difference.
Methods and material

- Individual expected normal ascending diameter was estimated by linear regression analysis:
  - Estimated diameter = 16.62 + age * 0.11 + BSA * 4.23 + 1.68 (if male)
- Size index = observed/estimated diameter
- Size index ≥ 1.25 = ectatic ascending aorta
- Size index ≥ 1.50 = asc. aortic aneurysm

Prevalence of ascending ectasies

- Diameter ≥ 40 mm:
  - 11.5% in men
  - 2.0% in women (p=0.001)
  - Size-index ≥ 1.25:
    - 3.4% in men
    - 2.6% in women (p=0.223)

Diagnostic accuracy of ≥ 40 mm

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<th>Men</th>
<th>Women</th>
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<tbody>
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<td>Sensitivity</td>
<td>78.9%</td>
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<tr>
<td>Specificity</td>
<td>91.6%</td>
<td>100.0%</td>
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<tr>
<td>PPV</td>
<td>25.6%</td>
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<tr>
<td>NPV</td>
<td>99.4%</td>
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70% of men recommended surveillance are false positives

Prevalence of ascending aneurysms

- Diameter ≥ 50 mm:
  - 0.2% in men
  - 0.1% in women
  - Size-index ≥ 1.5:
    - 0.1% in men
    - 0.1% in women

Diagnostic accuracy of ≥ 50 mm

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50% of men recommended evaluation are false positives

Conclusions

An absolute echocardiographic size-criterion of 40 mm will:
1. Miss 20% of women with ectatic ascending aorta (false negative)
2. Cause 70% false positives in men aged 65-74
An absolute echocardiographic size-criterion of 50 mm will:
1. Cause 50% of men with ascending aneurysms to be false positives

Relative cut-off points should be implemented clinically