High LDL Cholesterol (LDL-C) & Triglycerides Can Promote AAA Growth

Could Statins & PCSK-9 Inhibitors Slow It

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No disclosures

Lets keep things in context!

1970: 1 in 4
2010: 1 in 20

AAA is a coronary risk equivalent

- Anti-platelet therapy
- Anti-hypertensives
- LDL-lowering
- Stop smoking

Association vs Causality

- Observational studies
  - Cross-sectional
  - Prospective

Statin use associated with reduced:
AAA growth-rate
Rupture
Peri-operative complications
Adjusted for age, height, and country

Exclusions:
- Prior AAA, Heart Disease & Stroke; If missing AAA, Age, BMI, SBP, Sex, Smoking status.

AAA vs blood lipids

Data unlikely (OR adjusted for age, sex and country).

2M subjects
11,000 cases

Association vs Causality

- Observational studies
  - Cross-sectional
  - Prospective
- Genetic epidemiology
  - GWAS
  - Mendelian randomisation

Association of Lipid Genetic Risk Scores With Abdominal Aortic Aneurysm (AAA) Risk

Proof of causality requires randomised trials

Trials of statins and other LDL-C lowering agents...
PCSK9 Inhibitors and Inclisiran

Lipid biochemistry for surgeons
**HPS: 40mg simva v placebo**

- 20,000 high CV risk patients
- Simva 40 vs placebo
- Hard clinical endpoints
- AAA repair / death
- 5 years treatment + 6 years post-trial follow-up

**Did Simva 40 prevent AAA in HPS?**

AAA incidence (i.e., repairs or AAA-related deaths) during HPS:

- 5-year in-trial period (40mg simvatin vs placebo)
- 6-year post-trial period (lipid-lowering therapy equal both groups)

<table>
<thead>
<tr>
<th></th>
<th>Simvatin 40mg (n=10,269)</th>
<th>Placebo (n=10,267)</th>
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</thead>
<tbody>
<tr>
<td>In-trial period (5 yrs)</td>
<td>128 [1.2%]</td>
<td>122 [1.2%]</td>
</tr>
<tr>
<td>Post-trial Period (6 yrs)</td>
<td>85 [1.0%]</td>
<td>102 [1.2%]</td>
</tr>
<tr>
<td>Overall (11 yrs)</td>
<td>213 [2.1%]</td>
<td>224 [2.2%]</td>
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No clear evidence of benefit, but possibly under-powered to detect a moderate but clinically worthwhile effect

**AAA patients need triple medical therapy**

- Anti-platelet therapy
- Anti-hypertensives
- LDL-lowering
- Stop smoking

*Protect heart and brain...May also prevent AAA expansion*