Cost-effectiveness of using statins in primary and secondary prevention of cardiovascular disease

Neumann A¹, Neumann T², Schnell-Inderst P¹, Hessel F¹, Klauss V³, Wasem J¹

1) Institute for Health Care Management, University of Duisburg-Essen, Germany
2) Department of Cardiology, Division of Internal Medicine, University Clinic Essen, Germany
3) Department of Cardiology, Division of Internal Medicine, University Clinic Munich, Germany
Contents

1. Introduction
2. Objectives
3. Methods
4. Results
5. Conclusions
Hypercholesterinaemia is considered to be one of the major risk factors for arteriosclerosis.

Use of statins has increased significantly.

Large number of patients with hypercholesterinaemia.

- Statin use has an important impact.

Cost-effectiveness of statin use should be examined in primary and secondary prevention of cardiovascular disease.
Methods

- Interdisciplinary health technology assessment
- Systematic review of literature
- Use of studies from Embase, MEDLINE, Cochrane Library, AHCPR, DARE, NHS EED, HTA Database
- Identification of all relevant studies on primary and secondary prevention of cardiovascular diseases using statins
- Documentation of search history and selection of literature using predetermined inclusion criteria
- Quality assessment of studies used
Methods

- Extraction of data regarding:
  - Medical outcomes
  - Costs
  - Cost-effectiveness
- Results of economic evaluations synthesized in evidence tables
Results

Results of literature search for Medical Outcomes

- Literature on economic evaluations
  (n = 2255)

- Excluded literature
  (n = 2017)

- Included literature
  (n = 238)
Results

Results of literature search for Economic Evaluation

- Literature on economic evaluations
  (n = 40)

- Excluded literature
  (n = 30)

- Included literature
  (n = 10)
Results

Medical outcomes: MACE – primary prevention

Review: Statintherapie
Comparison: 01 MACE
Outcome: 01 Primärprävention

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Treatment n/N</th>
<th>Control n/N</th>
<th>RR (random) 95% CI</th>
<th>RR (random) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFCAPS</td>
<td>116/3304</td>
<td>183/3301</td>
<td></td>
<td>0.63 [0.50, 0.80]</td>
</tr>
<tr>
<td>WOSCOP</td>
<td>174/3302</td>
<td>248/3293</td>
<td></td>
<td>0.70 [0.58, 0.84]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>6606</td>
<td>6594</td>
<td></td>
<td>0.67 [0.58, 0.78]</td>
</tr>
</tbody>
</table>

Total events: 290 (Treatment), 431 (Control)
Test for heterogeneity: Chi² = 0.44, df = 1 (P = 0.51), I² = 0%
Test for overall effect: Z = 5.38 (P < 0.00001)
## Medical outcomes: MACE – secondary prevention

**Review:** Statintherapie  
**Comparison:** 01 MACE  
**Outcome:** 02 Sekundärprävention

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Treatment n/N</th>
<th>Control n/N</th>
<th>RR (random) 95% CI</th>
<th>RR (random) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCOT</td>
<td>86/5168</td>
<td>137/5137</td>
<td>0.62 [0.48, 0.81]</td>
<td></td>
</tr>
<tr>
<td>CARE</td>
<td>221/2081</td>
<td>274/2078</td>
<td>0.81 [0.68, 0.95]</td>
<td></td>
</tr>
<tr>
<td>HPS</td>
<td>898/10269</td>
<td>1212/10267</td>
<td>0.74 [0.68, 0.80]</td>
<td></td>
</tr>
<tr>
<td>LIPID</td>
<td>557/4512</td>
<td>715/4502</td>
<td>0.78 [0.70, 0.86]</td>
<td></td>
</tr>
<tr>
<td>LIPS</td>
<td>42/844</td>
<td>60/833</td>
<td>0.69 [0.47, 1.01]</td>
<td></td>
</tr>
<tr>
<td>Prosper</td>
<td>193/2891</td>
<td>246/2913</td>
<td>0.79 [0.66, 0.95]</td>
<td></td>
</tr>
<tr>
<td>4s</td>
<td>431/2221</td>
<td>622/2223</td>
<td>0.69 [0.62, 0.77]</td>
<td></td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>27986</strong></td>
<td><strong>27953</strong></td>
<td></td>
<td><strong>0.74 [0.71, 0.78]</strong></td>
</tr>
</tbody>
</table>

Total events: 2428 (Treatment), 3266 (Control)  
Test for heterogeneity: Chi² = 5.45, df = 6 (P = 0.49), I² = 0%  
Test for overall effect: Z = 11.92 (P < 0.00001)
Results

- Primary prevention
  - €37,013 per life-year gained based on the West of Scotland Coronary Prevention Study

- Secondary prevention
  - Cost-effectiveness analyses:
    - Results ranged from €4,490 per life year gained based on data from the Lescol Intervention Prevention Trial (LIPS) modelling to €10,313 per life year gained based on data from the Anglo-Scandinavian Cardiac Outcome Trial (ASCOT-LLA)
Cost-benefit analyses:

Results ranged from €4,671 per quality adjusted life year gained in LIPS to €36,238 per QALY gained based on different models using Cholesterol and Recurrent Events (CARE) data.
Conclusions

- Cost-effectiveness ratios based on data from studies of primary prevention are significantly higher than those from studies of secondary prevention.

- Results from studies of secondary prevention can be considered cost-effective.

- Results from studies of primary prevention must be regarded as limited and should be assessed in terms of risk of a cardiac or cardiovascular event in the future.
Cost-effectiveness of using statins in primary and secondary prevention of cardiovascular diseases

Thanks For Your Attention!