The Cost of Stroke Prevention

To the Editor:

Statin trials have consistently shown a robust (20% to 25%)\(^1,2\) reduction in major vascular events (myocardial infarction, stroke, vascular death), although a previous trial of simvastatin demonstrated no reduction in stroke rate for the subgroup of patients with preexisting cerebrovascular disease.\(^2\) Until recently, the use of statins for secondary stroke prevention in patients without coronary heart disease had not been fully addressed. However, on the basis of the Stroke Prevention by Aggressive Reduction in Cholesterol Levels (SPARCL) trial results,\(^3\) statin therapy has been added as Class I B evidence under the new American Heart Association/ American Stroke Association (AHA/ASA) recommendations.\(^4\)

In the SPARCL trial of atorvastatin for recent stroke or transient ischemic attack, the use of atorvastatin showed an impressive 16% relative risk reduction (2.2% absolute risk reduction) in subsequent stroke over 5 years.\(^3\) However, the results are tempered because statistical significance was achieved only after prespecified adjustments for geographic region, entry event, gender, and age. At $3.45 per tablet,\(^5\) the cost to prevent a single stroke is $289 628.

Therefore, when considering the new AHA/ASA recommendations, one must still regard the SPARCL trial results with respect to other new treatments and established therapies (Table)\(^2,3,6–12\) many of which are proven more timely and cost effective. The prohibitive cost of atorvastatin may limit its general applicability.

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**Table. Strategies for Secondary Stroke Prevention**

<table>
<thead>
<tr>
<th>Therapy (Study)</th>
<th>RRR Stroke, %</th>
<th>ARR Stroke, %</th>
<th>% of Patients With Stroke*</th>
<th>Time Frame, y</th>
<th>NNT</th>
<th>Cost Estimate** to Prevent 1 Stroke, US $</th>
<th>RRR Stroke, MI, Death, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin(^7)</td>
<td>16</td>
<td>2.2</td>
<td>11.2 vs 13.1</td>
<td>5</td>
<td>46 for 5 years</td>
<td>289 628</td>
<td>20</td>
</tr>
<tr>
<td>Simvastatin(^2)</td>
<td>No benefit</td>
<td>10.3 vs 10.4</td>
<td>5</td>
<td>NA</td>
<td>252</td>
<td>13.4</td>
<td></td>
</tr>
<tr>
<td>Aspirin(^10)</td>
<td>18</td>
<td>2.9</td>
<td>12.9 vs 15.8</td>
<td>2</td>
<td>34.5 for 2 years</td>
<td>61 068</td>
<td>32.8</td>
</tr>
<tr>
<td>Aspirin + dipyridamole(^10)</td>
<td>37</td>
<td>5.9</td>
<td>9.9 vs 15.8</td>
<td>2</td>
<td>252</td>
<td>13.4</td>
<td></td>
</tr>
<tr>
<td>Clopidogrel(^8)</td>
<td>Similar to ASA</td>
<td>9.7 vs 10.6 (compared with aspirin)</td>
<td>4</td>
<td>16.9 for 4 years</td>
<td>48 608</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Perindopril + indapamide(^9)</td>
<td>43</td>
<td>5.9</td>
<td>8.5 vs 14.4</td>
<td>4</td>
<td>16.9 for 4 years</td>
<td>48 608</td>
<td>40</td>
</tr>
<tr>
<td>Warfarin(^2) (atrial fibrillation)</td>
<td>67</td>
<td>8</td>
<td>4 vs 12</td>
<td>1</td>
<td>12.5 for 1 year</td>
<td>1825</td>
<td>53</td>
</tr>
<tr>
<td>CEA(^6) (70%–99% symptomatic stenosis)</td>
<td>65</td>
<td>17</td>
<td>9 vs 26 (with medical management)</td>
<td>2</td>
<td>5.9</td>
<td>71 461</td>
<td>51†</td>
</tr>
<tr>
<td>Carotid stent(^11,12) (high-surgical risk) Similar to CEA</td>
<td>62 vs 7.9 (compared with CEA)</td>
<td>1</td>
<td>102 672§</td>
<td>102 672§</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ACE indicates angiotensin-converting enzyme; ARR, absolute risk reduction; CEA, carotid endarterectomy; MI, myocardial infarction; NA, not available; NNT, No. needed to treat; RRR, relative risk reduction.

*Rate of stroke in study group vs placebo, unless noted otherwise.
†Rate of nonfatal MI occurring after 30 days is not reported in the composite outcome.
‡With no direct comparison between clopidogrel and placebo, the NNT from aspirin was used for cost comparison.
§With no direct comparison between carotid stent and medical therapy only, the NNT from the North American Symptomatic Endarterectomy Trial\(^6\) was used for cost comparison.


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