Review of Published Studies of the Cost-Effectiveness of Dietary Supplements

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Overview

• Results of systematic review of CAM economic evaluations
• Specifics regarding higher quality CEAs of dietary supplements
• Comments about use of studies in US
• Conclusions
Comprehensive Systematic Review

- 34 search terms for CAM
- 16 search terms for economics
- Searched all available years in:
  - PubMed
  - CINAHL
  - AMED
  - PsychInfo
  - Web of Science
  - EMBASE
Results

• Generated about 8,000 references to review after duplicates were removed
• ~1,000 of these were reviewed in more detail (English only)
• ~300 CAM economic evaluations
• 37 of these were of dietary supplements
## Dietary Supplement Studies

<table>
<thead>
<tr>
<th></th>
<th>Herbs</th>
<th>Vit/Min</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td><strong>Past 10 yrs</strong></td>
<td>14</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td><strong>Full evalns</strong></td>
<td>12</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td><strong>Min. quality</strong></td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>US study</strong></td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Minimum Study Quality

- Comparison to usual care
- Must include all relevant costs for one recognized perspective
- Effectiveness from a randomized or matched control trial
- Patient-specific data on both health and economic outcomes (models excluded)
- Sensitivity analysis
“Higher” Quality US Studies

Both were modeling studies:


Chromium & Biotin for DMII

- Effectiveness from several trials
- Used published estimates of medical cost savings per unit
- HbA1c reduced
- Medical cost savings/yr > annual cost of supplement
- Cost saving to payer

- Funded by a grant from nutritional supplement company (Nutrition 21, Inc).

Fish Oil Supplements for Men with a History of MI

- Effectiveness only in terms of CV and MI deaths from 4 trials
- Used Medicare cost of one hospital visit per death plus AHA estimate of productivity losses
- Cost saving to society
- “Cost-effective” to payer ($9,221 per MI death avoided)

Funded by the Council for Responsible Nutrition

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy, Franzosi ’01</td>
<td>RCT (n=5664) 3.5 Yrs</td>
<td>Higher cost-P Better LYS</td>
</tr>
<tr>
<td>UK, Quilici ’06</td>
<td>Model Lifetime</td>
<td>Higher cost-P Better LYS, QALYs, Deaths</td>
</tr>
<tr>
<td>AU, BE, CA, DE, PL Lamotte ’06</td>
<td>Model Lifetime</td>
<td>Higher cost-P Better LYS</td>
</tr>
<tr>
<td>Vitamin K&lt;sub&gt;1&lt;/sub&gt;</td>
<td>UK</td>
<td>Model</td>
</tr>
<tr>
<td>----------------------</td>
<td>----</td>
<td>-------</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>Stevenson ‘09</td>
<td>Lifetime</td>
</tr>
<tr>
<td>Vits C &amp; E, β-carotene</td>
<td>Canada</td>
<td>Model</td>
</tr>
<tr>
<td>Cataracts</td>
<td>Trevithick ’01</td>
<td>25 years</td>
</tr>
<tr>
<td>Grass pollen</td>
<td>UK*</td>
<td>RCT (n=151)</td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>Nasser ’08</td>
<td>9 Yrs</td>
</tr>
</tbody>
</table>
## Cost-Effectiveness Decision Matrix

<table>
<thead>
<tr>
<th>Improved Health</th>
<th>No Change</th>
<th>Worse Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Savings</td>
<td>No Change</td>
<td>Increased Costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definitely Adopt Alternative (Alternative Dominates)</td>
<td>Indifferent</td>
<td>Decision: Is health loss worth savings?</td>
</tr>
<tr>
<td>Decision: Are benefits worth costs?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Definitely Adopt Alternative (Alternative Dominates)**: When the alternative clearly provides more benefits at a lower cost for improved health.
- **Indifferent**: When there is no clear benefit or cost difference.
- **Definitely Reject Alternative (Base Case Dominates)**: When the alternative clearly results in worse health at a higher cost or increased costs without benefits.
Why Are CEA Studies Not Used?

- Not many available of dietary supplements
- Little (but possibly growing) demand
- Diffused authority to make allocative decisions
  - Miss out on ethical trade offs, skills & resources to evaluate, standards, data
- US Preventive Services Task Force (USPSTF)
Conclusions

• Very few CEAs of dietary supplements
• Little demand by US decision makers
• Benefit: more informed decision making
• If costs not included, we won’t know