Dietary Supplements and CVD: What to Use and What to Avoid

National Lipid Association
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Disclosures:
Contributing Editor
Natural Medicines Comprehensive Database
Learning Objectives

1) List three natural products with evidence of efficacy in the management of dyslipidemias.

2) Discuss pros and cons of using natural products in the management of dyslipidemias.

3) Describe issues unique to consider when discussing natural products with patients.

4) Identify two reliable sources of natural products information for use in clinical practice.
Terminology

- Natural medicines
- Natural products
- Dietary supplements
CAM use among patients with CVD

<table>
<thead>
<tr>
<th>CAM Use Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall CAM use</td>
<td>4%-61%</td>
</tr>
<tr>
<td>Herbal products</td>
<td>2%-46%</td>
</tr>
<tr>
<td>Non-Herbals</td>
<td>3%-54%</td>
</tr>
<tr>
<td>Mind-Body Therapies</td>
<td>2%-57%</td>
</tr>
<tr>
<td>Rx + CAM use</td>
<td>13%-26%</td>
</tr>
</tbody>
</table>

CAM use among patients with CVD

**Top Herbs**
- Echinacea
- Garlic
- Ginger
- Ginkgo
- Ginseng

**Top Non-Herbals**
- B12/B complex
- Vitamin C
- Vitamin E
- Calcium
- Glucosamine/Chondroitin
- Coenzyme Q10
- Cal/Mag

**Common Concurrent Meds**
- Warfarin
- Amiodarone
- Sotalol
- Digoxin
- Aspirin
- Beta-blockers
- ACE Inhibitors
- Statins

Natural Medicines Information Resources

Natural Medicines Comprehensive Database
www.naturaldatabase.com

Natural Standard
www.naturalstandard.com

Natural and Alternative Treatments Encyclopedia
www.consumerlab.com
## Evidence-Based Natural Products

<table>
<thead>
<tr>
<th></th>
<th>Positive Evidence</th>
<th>Negative Evidence</th>
<th>Insufficient Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Database</td>
<td>43</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>Natural Standard</td>
<td>23</td>
<td>5</td>
<td>73</td>
</tr>
</tbody>
</table>

[Natural Medicines Comprehensive Database](accessed 03.Jan.2014)
[Natural Standard](accessed 03.Jan.2014)
Cultural Influences

Ayurveda and East Indian Culture

Foods vs Medicines

Traditional Indian diet vs Western diet

Changes in dietary patterns and health

Fenugreek

*Trigonella foenum-graecum* seeds

Animal studies looked promising.

(-) Limited human research finds of **no** cholesterol lowering effects.

Garlic

*Allium sativum* bulb

Many forms researched: raw, powder, oil, aged garlic extract and others

(+) Older human studies (small, poor design) found modest cholesterol lowering benefit vs placebo.

(-) Newer, better designed trials find no difference vs placebo.

(-) Overall... no significant, long-term cholesterol-lowering effects.

Curcumin

Extracted from turmeric (*Curcuma longa*) root.

(+) Preliminary human research finds curcumin reduces triglycerides in patients with TG>150 mg/dL with no effect on total, HDL- or LDL-cholesterol.

(+) Safety established in human studies up to 8 months... well tolerated, GI side effects most common

Dosing: not yet well established... 500 mg *curcumin* PO 1-2 times daily.

Guggul

Resin of the tree *Commiphora mukul.*

(+) Human evidence from studies in Asia suggest cholesterol lowering effects.

(-) Research in Western population finds no effect on total cholesterol, HDL or triglycerides... LDL increased 10%.

Red Yeast Rice

Product of fermentation of rice with *Monascus purpureus* yeast.

Contains up to ten monacolins, structurally related to “statins”... monacolin K (aka., mevinolin), found in greatest concentration, identical to lovastatin

(+) Lowers total and LDL-cholesterol equivalent to a low dose “statin”

(+) Patients intolerant of “statins” may tolerate RYR

(-) Product contents inadequately labeled to discern monacolin content

(-) Product quality varies greatly

(-) Improperly fermented products may contain citrinin (nephrotoxin)

Coenzyme Q-10

Statins reduce serum CoQ-10 levels... clinical significance and potential benefit(s) of CoQ10 supplementation unclear

(+) / (-) Mixed human evidence for CoQ10 improving statin-induced muscle weakness or other adverse effects

(+ ) CoQ10 is well-tolerated, minor GI side effects occasionally reported.

Dosing: 100-200 mg/day; divide doses > 100 mg/day to reduce GI side effects
Mixture of long-chain aliphatic alcohols derived from plant sources (rice, sugar cane, wheat germ, etc.)

(+) Early studies conducted in Cuba using sugar cane derived product significant reduced total and LDL-cholesterol, increased HDL-C.

(-) Newer studies performed in other countries using products derived from a variety of plant sources find no beneficial effect on cholesterol levels.
Tocotrienols

Members of the vitamin E family (α, β, γ, δ isomers) extracted from corn, palm, rice bran and other oils... reduce cholesterol production.

Found together with tocopherols in “tocotrienols-rich fractions” (TRFs)...  
>20% tocopherols reduces lipid lowering activity.

Greater tocotrienol:tocopherol ratio associated with greater total and LDL-C reduction... no effect on TG or HDL-C.

(+)/(−) Limited, short-term human studies suggest 10-15% TC lowering and 8-15% LDL lowering... some studies found no lipid lowering effects.

?? Safety data lacking (adverse effects not noted in published studies).

Dosing: 200 mg γ-/δ-tocotrienols PO daily in the evening with food.

Pantethine

Related to pantothenic acid (vitamin B5), with different physiologic activities... inhibits cholesterol synthesis.

(+ ) Modestly decreases total cholesterol, LDL-C, TG... increases HDL-C...
   Human data from small, poorly designed studies, mostly of short duration.
   No new studies reported since 1991.

(+ ) Safety established up to one year... well tolerated, causes minor GI side effects.

Dosing: 300 mg PO three times daily

Pantethine Professional Monograph. Natural Standard. (accessed 3 Jan 2014)
Plant Stanols and Sterols

Fatty acids found in plants... similar in structure to cholesterol, bound to plant fiber and poorly absorbed... reduce intestinal cholesterol absorption.

Available in margarine-like spreads and as supplements.

(+) Reduce LDL-C by 5% to 17%, no effect on TG or HDL-C.

(+) One meta-analysis finds stanols may have a greater LDL-C lowering effect than sterols (16% vs 8%).

(+) Well tolerated... minor GI side effects; stanols may cause steatorrhea, sterols may cause erectile dysfunction and loss of libido.

Dosing: 2 grams PO daily as single dose or divided.

Sitostanol Monograph. Natural Medicines Comprehensive Database. (accessed 3 Jan 2013)
Plant Stanols vs. Sterols

Plant sterols absorbed with cholesterol.

Statin treatment associated with increased plant sterol absorption and sterol concentrations in arterial plaques.

Plant stanols not incorporated into arterial wall.

Plant stanol consumption reduces carotid artery sterol concentrations in statin-treated patients.

? Question- are plant sterols atherogenic?

## Dietary Portfolio

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>plant stanols and sterols</td>
<td>2 gm/2000 kcal</td>
<td>4 TBSP (500 mg/TBSP)</td>
</tr>
<tr>
<td>soy protein</td>
<td>45 gm/2000 kcal</td>
<td>½ cup soy protein powder</td>
</tr>
<tr>
<td>soluble fiber</td>
<td>20 gm/2000 kcal</td>
<td>5 cups dry oats</td>
</tr>
<tr>
<td>almonds (tree nuts)</td>
<td>46 gm/2000 kcal</td>
<td>1/3 cup</td>
</tr>
</tbody>
</table>

Dietary Portfolio

Plant stanols/sterols, soy protein, soluble fiber, tree nuts

(+) All foods in diet → sustained 15% LDL-C reduction

(+) Two foods → sustained 10% LDL-C reduction

Summary

Evidence for the safety and efficacy of specific natural products in the management of dyslipidemias is variable.

Some natural products can achieve modest lipid reductions (type and degree of reduction are product specific).

Monitor for interactions and adverse effects.

Refer to reliable, up-to-date natural medicines information resources.


References


