Herbal Supplements: All Natural OR Profit Factories?

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Objectives

Pharmacist Learning Objectives: At the completion of this activity, the participant will be able to:

• 1. Identify herbal/dietary supplements according to the federal government’s standards.
• 2. Examine patient symptoms to determine whether illness may be associated with supplements.
• 3. Analyze the use of herbal/dietary supplements for potential interactions.

Objectives

Technician Learning Objectives: At the completion of this activity, the participant will be able to:

• 1. Contrast legal classification of herbal/dietary supplements to FDA approved medications.
• 2. Identify patients who may benefit from pharmacist intervention in regards to herbal/dietary supplement use.
• 3. Define legally allowed wording in regards to herbal/dietary supplement use.
FDA and Supplements

- Dietary supplements under ‘umbrella’ of foods; FDA’s Center for Food Safety and Applied Nutrition (CFSAN) is responsible.
- No manufacturer/distributor list or of products
- Manufacturer responsible for ensuring product is safe before marketed.
- FDA responsible after reaches market.
- Approximately 4% of FDA’s CFSAN dedicated to dietary supplements.

FDA and Supplements

- Dec 2015: Office of Dietary Supplement Programs (ODSP) Created
- ODSP’s former parent office will now be known as the Office of Nutrition and Food Labeling
- Leadership of Doug Balentine, Ph.D.:
  - joined FDA on December 14, 2015.
  - Ph.D. in food science and nutrition from Rutgers University.
  - As head of the Office, he will oversee development of policies and regulations for nutrition labeling and food standards, infant formula and medical foods.

FDA Required Information

Required on dietary supplement label:
- Descriptive name of product stating is a ‘supplement’
- Name, place of business of manufacturer, packer, or distributor
- Complete list of ingredients
- Net contents of product
- Nutrition labeling in form of a “Supplement Facts” panel; label must identify each dietary ingredient contained product.
Requirements?

- Companies providing raw ingredient not required to follow same regulations as manufacturer

- Manufacturers, not FDA, determine quality specifications for products; if want to use less stringent specifications can do so without penalty.

Wording is Everything!

- Use careful wording on supplement use + be supportive to learn which a patient may take

- 9/2007, TN RPh fined $1 million: ‘treating’ customers @ health food store w/juices, food supplements. Made claims cured people, ‘practicing w/out naturopathy license’.

- 2006/07, civil penalties/fined: LPN $100,000 and RN $719,000. Unlicensed in naturopathy.

- Risk of ‘negligence’ if do not counsel
Wording is Everything!
Protect Yourself and NEVER state:

- Prevention, Prevent, Preventative
- Diagnose, Diagnosis
- Treat, Treatment
- Cure, Curative

Technicians
- Front line: assist patients in receiving counsel on supplements
- Use careful wording on supplement use
- Ensure Pharmacist aware if offering them to counsel on supplements
- Ensure does not go against company policy

Patient Questions
- Do you use any herbal products?
- Do you use any dietary supplements?
- Do you use any natural therapies?
- Do you use any extracts?
- Do you use any other supplements?
- Do you use any alternative therapies?
- If takes multivitamin: brand and product name- many contain herbals.
Patient Use
• 1999: > 25% patients used supplements
2009:
• > 50 % patients used supplements
• 75% did not disclose use
After 2009:
• Estimated: 600+ US manufacturers producing over 4000+ products
• > $35 Billion in sales

Potential Bleeding Risk
• Danshen
• Dong Quai
• Feverfew
• Fish Oil
• Garlic
• Ginger
• Gingko Biloba
• Ginseng
• Kava
• Omega 3 fatty acids
• Vitamin E

Potential CNS Depressants
• Hops
• Kava
• Lavender
• Lemon Balm
• Melatonin
• Passion Flower
• St. John’s Wort
• Valerian Root
Potential Cardiac injury

- Belladonna
- Ginseng
- Hellebore
- Licorice
- Ma Huang
- Oleander
- Yohimbine

Renal Damage

- Supplement use is NOT recommended

Potentially cause kidney damage:

<table>
<thead>
<tr>
<th>Aristolochic acid</th>
<th>Horsetail</th>
<th>Nettle, Stinging Nettle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astragalus</td>
<td>Huperzinea</td>
<td>Oregon Grape Root</td>
</tr>
<tr>
<td>Barberry</td>
<td>Java Tea Leaf</td>
<td>Parsley Root</td>
</tr>
<tr>
<td>Cat's Claw</td>
<td>Larrea t. (Chaparral)</td>
<td>Pennyroyal</td>
</tr>
<tr>
<td>Creatine</td>
<td>Licorice Root</td>
<td>Ruta Graveolens</td>
</tr>
<tr>
<td>Germanium</td>
<td>L-Lysine</td>
<td>Uva Ursi</td>
</tr>
<tr>
<td>Goldenrod</td>
<td>Skullcap</td>
<td>Yohimbe</td>
</tr>
</tbody>
</table>

Hepatic Damage

- Supplement use is NOT recommended

Potentially cause liver damage:

<table>
<thead>
<tr>
<th>Bark Extract</th>
<th>Body Building Supplements</th>
<th>C. Sinensis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatine</td>
<td>Dandelion Root</td>
<td>DHEA</td>
</tr>
<tr>
<td>Garcinia Cambogia</td>
<td>Germander</td>
<td>Green Tea Extract</td>
</tr>
<tr>
<td>Herb life</td>
<td>Hydroxycut</td>
<td>Kava</td>
</tr>
<tr>
<td>Ma Huang</td>
<td>Milk Thistle</td>
<td>Skullcap</td>
</tr>
<tr>
<td>Usnic Acid</td>
<td>Weight Loss Supplements</td>
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</tbody>
</table>
ED Visits from Supplements

- Adulteration
- Therapeutic doses
- Supratherapeutic doses
- Supplement/medication interactions
- Supplement/disease interactions

Adulterations

- Minimal monitoring over supplements
- Adulterations found: steroids, sildenafil, sibutramine, tadalafil, ephedrine, terazosin, aromatase inhibitors, bumetanide, diclofenac, methocarbamol, dexamethasone, propranolol, furosemide, fenfluramine, fluoxetine, phenolphthalein, phenytoin, vardenafil
- FDA Tainted Supplement Page:

New York 2015

- Devil's Claw: 13 manufactures cease/desist due to adulteration
- GNC, Target, Walgreen's, Walmart: cease/desist for store brand supplements due to adulteration
- GNC: setting up contract and independent testing of products
Class Action Lawsuits

• California: 6+ against Target, Walgreen’s, Walmart

• California: Dr. Oz included in ‘weight loss’ supplement lawsuit

• Illinois: 20+ consumers (? weak case)

• Lawyers: targeting public, using NY as reason to initiate suits

Adulteration: Acai Berry

• No recent workout change. HTN controlled (amlodipine). ED: appear acutely ill, pain w/strength testing all extremities, tenderness to muscle palpitation. Urine-ruddy brown, (+) myoglobin, lg amt of blood, 0 RBC. Scr 1.1, CK 84,000 IU/L, urine tox (-). Rhabdomyolysis, Acai Berry d/c, IV NS @ 200 mL/hr, by day 2 sx improved & CK peaked @ 172,000.

Adulteration: Acai Berry

• 22 yo male present to ED: myalgia, dark brown urine, muscle warmth, fatigue. Fireman, exercise x 3 mo, Acai Berry start 2 wks PTA (label: Acai Berry 50 mg, caffeine 200 mg, green tea 225 mg, chromium polynicotinate 75 mCg, L-theanine 8 mg). Sx- few days after start Acai Berry, slowly progress in severity. Urine turned dark 3 days PTA. Adequate liquids: 64 – 86 oz H2O/gatorade w/workouts.
Yohimbine
• 16 yo female, 1 dose: acute dissociative rxn, w/in 20 min- weakness, parasthesias, loss of coordination. ED: tachycardia, htn, tachypnea. Within 6 hrs: substernal chest pain, loss of coordination.
• Resolution sx 36 hrs after presentation.

Betel Nut
• 4th most commonly abused substance worldwide (behind caffeine, etoh, nicotine)
• Can cause withdrawal sx
• Found in ethnic groceries and Internet
• Acts as acetylcholinesterase inhibitor
• Excessive: tachycardia, palpitations, hypotension, dyspnea, diaphoresis, vomiting, dizziness, chest pain, pupillary constriction, asthmatic exacerbation, bradycardia, acute psychosis, dystonia, sz, nephrolithiasis, pulmonary edema, bronchospasm, death

Jimson Seed
• 16 yo male, ingested approx 40 @ unknown time. ED- hallucinating, combative, agitated, dilated pupils, flushed skin, stable vs, (-) urine tox.
• ICU stay, discharged in 2 days.
Kava

• Dermopathy
  – 70 yo male took Kava x 2-3 wks for anxiety: itching several hours after sun exposure. Erythematous infiltrated plaques then developed on his face/chest/back
  – 52 yo female took Kava x 3 weeks: papules and plaques on face/arms/back/chest
  – Biopsy of both: lymphocytic infiltration of dermus, destruction of sebaceous glands.

St. John’s Wort

• Possible MAOI interactions, should allow 2 weeks before antidepressants
  – 50 yo f: St. John’s Wort x 10 d, 1 paroxetine 20 mg: incoherent, lethargic, nausea, weakness, fatigue; previously took paroxetine 40 mg x 8 month (d/c prior to St. John’s Wort)
  – 2 heart transplant pt’s: depressed, given St. John’s Wort, cyclosporine to ineffective level, both rejected their hearts, prev no problem
  – Possible concern for MAIO interaction/foods

St. John’s Wort - other

• 35 yo female: decided to self-treat & took St. John’s Wort x 4 weeks. Sun exposed areas: stinging pain; pain worsened by cold, minimal mechanical stimuli, and sun exposure. Resolved after 2 months off St. John’s Wort. Felt to be demyelination of cutaneous axons caused by photoactivated hypericins.
Take Home Points for Patient Care

• Natural ≠ Safe
• Grow at home, for safest option: may still cause harm
• Purchase from reliable farm: may still cause harm
• Data lacking, all interactions not yet known

Antioxidants

• Separate cholesterol treatments from antioxidants
• Simvastatin and niacin: beneficial response decreased if taken with antioxidants.
• Class effect?

Antioxidants

Hundreds, probably thousands, of different substances that can act as antioxidants, some are:
• Beta-carotene (& carotenoids), Lutein, Lycopene, Selenium, Vitamin A, Vitamin C, Vitamin E
• Glutathione, Coenzyme Q10, lipoic acid, flavonoids, phenols, polyphenols, phytoestrogens
• Foods high in carotenoids include: red/orange/deep-yellow/some dark-green leafy vegetables (eg tomato, carrots, spinach, brussels sprouts, sweet potato, winter squash and broccoli).
• Vitamin E: vegetable oils, salad dressings, margarine, wheat germ, whole-grain products, seeds, nuts, peanut butter.
• Vitamin C: citrus fruits (eg oranges, grapefruits and tangerines), strawberries, sweet peppers, tomatoes, broccoli and potatoes.
• Found in: some meats, poultry and fish, and many more things
Take Home Points

- Many untruths: “Our factory is inspected”: unlikely during supplement production
- If a manufacturer’s product becomes FDA approved, ONLY that manufacturer’s product is FDA approved
- FDA wants to know about serious reactions or illnesses, even if not certain the product was the cause: 800-FDA-1088; fax: 800-FDA-0178; (FDA=332)

Questions?

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References


References


Supplement Information

- [www.fda.gov](http://www.fda.gov)
- Micromedex: AltMedDex
- Poisindex
- Lexi-Natural
- Some institutions have contracts with other resources