A Vitamin A Day Keeps The Pharmacist Away...Or Does It?

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Objectives

• Identify the more common supplements, minerals and integrative therapies patients seek

• Evaluate the literature (or lack thereof) and information available for integrative therapies

• Analyze the appropriateness of integrative therapies in combination with patient’s medication regimens

• Identify reliable sources for information and products
  • What “seals” can you look for to ensure safety, good compounding procedures?
Alternative

VS

Complementary

VS

Integrative
We LOVE Our Supplements

- 33% of adult Americans used complementary health approaches
  - >11% of children 4-17 years old
  - $30.2 billion per year out-of-pocket
- Nonvitamin, nonmineral dietary supplements are the most commonly used complementary health approach
- >30% of adult Americans take a multivitamin-mineral product
  - $5.5 billion spent each year
- <5% used complementary medicine INSTEAD OF traditional medicine

Most Common Natural Products?
Clinical Questions:

• Frankincense (boswellia extract) orally

• Continuing diffused and topical oils

• Turmeric (curcumin)

• Garlic extract
Essential Oils

• Extracted from aromatic plant materials
  • Steam distillation
  • Mechanical expression

• Oils that are extracted using chemical solvents are NOT true essential oils

• Inhalation (aromatherapy) and topical
Essential Oils

• Animal and human data exist!
  • Address role as supportive therapy on stress and anxiety levels
• Both aromatherapy and topical

References

PDQ® Cancer Information Summaries. Bethesda(MD): National Cancer Institute; 2002- (Published Online April 2016)
Essential Oils

• Adverse effects
  • Contact dermatitis/local irritation
  • Phototoxicity (use just prior to sun exposure)

• Oxidized with aging
  • Chemical composition changes

• Lavender and tea tree oils
  • Possible estrogenic and antiandrogenic activity
  • Case reports and in vitro tests

Clinical Questions:

• Continuing diffused and topical oils 😊

• Frankincense (boswellia extract) orally

• Turmeric (curcumin)

• Garlic extract
Boswellia serrata
Frankincense

- Resin contains 4 major pentacyclic triterpenic acids (boswellic acids)
  - Responsible for inhibition of pro-inflammatory enzymes
- Shown in in vitro and animal models to inhibit synthesis of 5-lipoxygenase and leukotriene B4

Boswellia serrata

• Dose, formulation, frequency?
  • Inconsistent product use in trials
  • Many formulations available – capsules, tablets
    • Be wary of amount of boswellic acids per dosage form
    • Goal: 65% boswellic acid
  • 300-400 mg per dose, 2-3 times per day
    • Start lower for kids, increase gradually in 3-4 weeks

• Adverse effects
  • GI upset

• Interactions
  • Minimal
Clinical Questions:

• Continuing diffused and topical oils

• Frankincense (boswellia extract) orally 😊

• Turmeric (curcumin)

• Garlic extract
Turmeric (curcumin)

- Shown to inhibit various apoptotic/necrotic pathways
  - Antiangiogenic properties
  - Anti-inflammatory effects
- Interaction with chemo
- Inhibition of metabolizing enzymes
- Possible kidney stones

https://www.mskcc.org/cancer-care/integrative-medicine/herbs
Garlic

• Actual placebo-controlled trials for cholesterol-lowering - variable

• Human studies in cardiovascular disease, blood pressure – known to decrease platelet aggregation

• Most case reports of adverse effects = bleeding!
  • Also stomach upset, headache, fatigue, offensive odor

• Drug interactions
  • Warfarin; watch out for other medications with bleeding effects
  • Inhibits AND Increases medication metabolic processes

https://www.mskcc.org/cancer-care/integrative-medicine/herbs
Clinical Questions:

• Continuing diffused and topical oils

• Frankincense (*boswellia* extract) orally

• *Turmeric* (*curcumin*)

• *Garlic extract*
Clinical Questions:

• Probiotics: when patient completes chemotherapy

• Garlic and curcumin extracts: when patient completes chemotherapy

• Vitamin D and multivitamin 😊

• Liquid oxygen
Liquid Oxygen

• "Stabilized oxygen" in liquid form
  • Usually a combination of hydrogen peroxide

• Some products must be diluted before using
  • pH: 12-13

• "Safe" products are made up of
  4 molecules of oxygen

"The Liquid Stabilized Oxygen is processed by a secret, proprietary method...."
Clinical Questions:

• Probiotics: when patient completes chemotherapy

• Garlic and curcumin extracts: when patient completes chemotherapy

• Vitamin D and multivitamin

• Liquid Oxygen
Probiotics

• "Live microorganisms which when administered in adequate amounts confer a health benefit on the host" (WHO definition)

• Common strains:
  • Lactobacillus
  • Bifidobacterium
  • Saccharomyces cerevisiae (yeast)

• Prevent/limit infectious diarrhea, antibiotic-associated diarrhea, diarrhea from recurrent C. diff
  • Possible utility in other gastrointestinal diseases, allergic disorders
Probiotics In Cancer

• Questionable role in alleviating chemotherapy-induced diarrhea
• Primary concern: NEUTROPENIA
• Case reports of microorganism in probiotic being isolated from blood cultures of patients
• Current recommendation: Avoid probiotics when expected to be neutropenic
Clinical Questions:

• **Probiotics**: when patient completes chemotherapy

• Garlic and curcumin extracts: when patient completes chemotherapy

• Vitamin D and multivitamin

• Liquid Oxygen
Back to our other favorites...
Fish Oil

• Well established: primary and secondary prevention studies show reduction in all-cause mortality and cardiovascular disease outcomes such as sudden death, cardiac death, myocardial infarction
  • Best evidence: fish and fish oil supplements

• Lower triglyceride levels

• Small beneficial effect on blood pressure
Fish Oil – Impact on Other Diseases

Inconclusive
• Asthma
• Inflammatory bowel disease
• Renal disease
• Lupus
• Bone density
• Diabetes
• Cognitive function

Greater Potential
• Rheumatoid arthritis
Fish Oil Products

• Prescription product (Lovaza)
  • Higher amounts of EPA/DHA

• Multiple dietary supplements
  • Check label for content of EPA and DHA as well as source

• Alternatives to fish oil products
  • Algal oils provide a vegetarian source of DHA
  • Krill oil becoming more popular
Table 1

The original sources, prices and contents of EPA and DHA in ten batches of fish oil capsule samples bought in Hong Kong (n = 3)

<table>
<thead>
<tr>
<th>Sample no.</th>
<th>Labelled origin</th>
<th>Price (HKS/g)</th>
<th>Labelled contents (mg/g)</th>
<th>Determined contents (mg/g)</th>
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<td></td>
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<td>DHA</td>
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</table>

<sup>a</sup>Samples are listed in order of decreasing price; that is, the most expensive are listed first.
Fish Oil and Chemotherapy

• Question of whether a specific fatty acid found in fish oil (supplemental and natural) can cause resistance to chemotherapy
  • Seen in mouse models with cisplatin
  • Ingestion of recommended daily amount of fish oil by health volunteers raised levels of this fatty acid

• Not concrete, but given potential harm, we recommend to hold fish oil (and not to eat fatty fish) the day before, during and day after chemotherapy
Melatonin

• Use has more than doubled from 2007 to 2012
  • 0.6% up to 1.3%

• Significant evidence (in children too!) to show improvement in sleep duration and quality
  • This is generally the only sleep aid we recommend in pediatric patients
  • Often used in patients with underlying neurological disorders and cancer
Melatonin

• Evidence to support possible anti-tumor effects
  • Free radical scavenger
  • Stimulates IL-4 production in T-lymphocytes
  • Antimitotic effect – interrupts tumor growth
  • Interferes with estrogen receptor expression

• Adverse effects: drowsiness

• Interactions: minor medication metabolic inhibition
What To Look For

• The guys on TV are good, but do not always present the most robust information

• Guidelines?

• While studies may find a “statistically significant” difference within the numbers and confines of their design (in vitro versus in vivo), the CLINICAL SIGNIFICANCE is very important to note
  • So while in vitro testing may show the desired effect at the cellular level, translation to in vivo effect is often unknown
Guidelines Exist!

- American Academy of Neurology: http://www.neurology.org/content/78/17/1346.full.pdf+html
- National Cancer Institute: http://jncimono.oxfordjournals.org/content/2014/50/346.full.pdf+html
- American College of Obstetricians and Gynecologits: Clinical Management Guidelines for Management of Menopausal Symptoms
What To Look For

• If it claims to “cure” a disease or has a “money-back guarantee”  
  BEWARE!

• Check the label for all ingredients listed (THEY HAVE TO DO THIS!)
  • Look for wheat, soy, dairy, nuts, other allergens

• Check the company online
  • Do they have a 3rd party source/lab that provides product checking?
  • Do they provide this information on their website?

• These are ideal to see on a label:
  • NSF International (nsf.org)
  • US Pharmacopeia
    • (www.usp.org/usp-consumers/dietary-supplements-consumers)
  • Consumer Lab seal
    • Need a subscription for full information online
Conclusions

• Use of complementary therapies is increasing
  • Not just your typical fish oils, calciums and black cohosh anymore!

• Data, literature, resources exist to help guide use and decision making
  • ESPECIALLY in combination with conventional therapies

• When possible, we try to help patients pick a product and give them information to support safe use
Zinc

• Cold preparations
  • Multiple studies show a decrease in duration and severity of cold symptoms
  • Multiple studies show no difference
  • Most recent large review of literature done supports benefit

• Lozenges >>>> Nasal products
  • Multiple case reports of anosmia (loss of smell)
  • 3 products recalled in 2009

• If needed, use the lozenges and use sparingly
  • No specific data to support recommendations on doses, length of treatment
Black Cohosh

- Potential use in postmenopausal women for hot flashes
  - Binds estrogen receptors
- Most well studied product – Remifemin
- While majority of studies (small and short duration) showed benefit, there is difficulty in evaluating the effect
  - Short duration (6 months or less) of study
  - Varying amounts used from different sources
- New study being conducted by NIH: 12 months long
  - Will also try to better determine mechanism of action
CBD Oil – Over the Counter

• Extracted from hemp plant
• Must come from hemp plant that contains <0.3% THC
• Oils, gummies, lollipops, capsules, topical preparations
• Potential benefits:
  • Anxiety
  • Sleep
  • Pain