Supplements and Vitamins for the Allergist: 2021 ACAAI Annual Meeting: New Orleans, LA

- Anil Nanda, MD, FACAAI
  - Community Private Practice
  - Asthma and Allergy Center
    - Lewisville and Flower Mound, Texas
  - Clinical Faculty
    - Division of Allergy and Immunology
    - University of Texas Southwestern Medical Center
    - Dallas, Texas

Disclosures

- No financial relationships to disclose
Learning Objective

Discuss Supplements and Vitamins Specifically in Regards to Allergy and Immunology Physicians and Providers

Vitamins and Supplements in Allergy and Immunology Practice

- 33% of adults, 12%-47% children use complementary medicine (vitamins/supplements)

- Approximately 66% of patients want to discuss complementary medicine approaches

- $34 billion annually spent on complementary medicine products

- Increased public interest in complementary medicine

Silvers W, Bailey H. Integrative approach to allergy and asthma... Ann Allergy Asthma Immunol 2014; 112: 280-5.
FDA Supplement Act of 1994

- Dietary Supplement and Health Education Act of 1994
- U.S. Food and Drug Administration (FDA): Regulation of dietary supplements
- Prohibiting manufacturers of dietary supplements to market products that are adulterated or misbranded.
- Manufacturers required to notify FDA before new dietary ingredients are marketed
- “Confusion”, “uncertainty” regarding supplements

Precautions

- Many “alternative” products such as herbal medications, vitamins, or supplements have not been evaluated or studied in a similar way as conventional medications by the U.S. Food and Drug Administration.
- Side effects, medication interactions, etc.
- **Emphasize this to patients.**
- Board certified allergy and immunology physicians can help guide and navigate patients on alternative and/or complementary products, just as we do in traditional medicine.
Vitamins and Supplements in an Allergy Practice

Using **vitamins and supplements** to **Complement a Traditional Practice** with **Board Certified Allergy and Immunology Physicians**

- Conventional/Traditional medications often times may not be 100% effective. There is an “unmet need”.
- Patients may want additional treatments besides conventional therapy.
- Discuss potential risks and benefits and that many are NOT FDA approved

COVID-19

- **Vitamin D**: Improves innate cellular immunity
  - Antimicrobial peptides: cathelicidin and defensins
  - May protect respiratory epithelium
  - Some patients with COVID-19 have lower vitamin D levels
  - Vitamin D deficiency may be linked to higher COVID-19 mortality
  - Vitamin D deficiency: older age, obesity, hypertension, coagulopathy

COVID-19

• **Vitamin D**
  - To date, no definitive efficacy of vitamin D in COVID-19 patients
  - Recommended daily allowance of vitamin D: 400 IU to 800 IU
  - Vitamin D Toxicity (Hypervitaminosis D): rare
    - Hypercalcemia, nausea, vomiting, weakness, frequent urination

  [https://www.covid19treatmentguidelines.nih.gov/therapies/supplements/vitamin-d/](https://www.covid19treatmentguidelines.nih.gov/therapies/supplements/vitamin-d/)
  [www.mayoclinic.org](www.mayoclinic.org)

COVID-19

• **Vitamin C**: Anti-oxidant protecting proteins, lipids, and nucleotides from oxidative damage
  - Cytokine storm: TNF-a, IL-1B
  - Vitamin C: Reduces levels of these pro-inflammatory cytokines
  - Vitamin C Recommended daily amount: 65-90 mg per day
  - Vitamin C toxicity (rare): diarrhea, nausea, vomiting
  - To date, no definitive efficacy of vitamin C in both non-critical and critical COVID-19 patients

  [www.mayoclinic.org](www.mayoclinic.org)
COVID-19

• Zinc
  • Zinc deficiency is associated with an increase in pro-inflammatory cytokines and reduces cell barrier function
  • Zinc supplementation has been shown to increase NK cells, CD4+, CD8+ T cells
  • Reduces synthesis, replication, and transcription of coronaviruses in cell culture
  • Case series has shown clinical symptomatic improvements in patients with COVID-19
  • Decrease lower respiratory tract symptoms in COVID-19, possibly due to inhibition of viral uncoating, binding, and replication


• To date, no definitive efficacy of zinc in COVID-19 patients

NIH recommends AGAINST using zinc as a prevention against COVID-19 above the recommended dietary allowance (11 mg in men, 8 mg in nonpregnant women)

• Zinc toxicity (rare): GI side effects

https://www.covid19treatmentguidelines.nih.gov/therapies/supplements/zinc/
COVID-19

- **Omega-3 Fatty Acids**
  - Favorable Effects on Immunity and Inflammation
  - ?Improve Oxygenation in COVID-19 patients

- To date, unknown efficacy of Omega-3 Fatty Acids in COVID-19 patients


Asthma

- **Vitamin D:**
  - Inverse relationship in pregnancy between vitamin D supplement intake and asthma in children
  - Adults: Vitamin D3 supplementation reduced severe asthma exacerbations
  - **Observational data, may be influenced by pollution and obesity**

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.
Asthma

- **Vitamin C**: Anti-oxidant
  - 500 mg daily or placebo in pregnant women smokers (Pacific NW, North America)
  - Decreased wheezing in infants up to one year of life in Vitamin C group
  - To date, unknown efficacy of Vitamin C in asthma patients

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.

Asthma

- **Vitamin E**: Anti-oxidant
  - Maternal Vitamin E intake was protective
  - Decreased wheezing in infants up to two years and protective from asthma up to age 10 years
  - To date, unknown efficacy of Vitamin E in asthma patients

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.
Asthma

• **Probiotics**: Microorganisms that have beneficial properties for host
  • Modulate immune system
  • Protective cytokines: IL-10 and TGF-B
  • *Lactobacillus casei/L. gasseri* treatment in studies showed reduction in asthma and allergic rhinitis symptoms and severity in children
  • **Differences in probiotic preparations, study populations, outcome measures**

Gupta P, Sheth D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.

Asthma

• **Magnesium**: Bronchodilator effects on smooth muscle by inhibition of calcium influx
  • Nebulized magnesium in acute asthma
  • Adding nebulized magnesium to bronchodilators have not affected hospital outcomes of moderate-severe asthma in children
  • Oral magnesium: Improved FEV1 at 8 weeks

Gupta P, Sheth D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.
Asthma

• **Omega-3 Fatty Acids:**
  - Fish oil supplementation in pregnant women suggested reduction of wheezing and asthma in children up to 5 years
  - Other studies in children did not show benefit in asthma symptoms despite supplementation with omega-3 fatty acids

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.

Asthma

• **Butterbur (Petasistes Hybodus):**
  - may alter leukotriene pathway
  - Adults with asthma: Adding 25 mg butterbur twice daily revealed decreased exhaled nitric oxide and peripheral blood eosinophil count
  - Potential liver toxicity: pyrrolizidine alkaloids

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.
Asthma

• **Pycnogenol®:**
  • Bark of *Pinus pinaster* pine
  • Children with asthma: Improved pulmonary function and asthma control, less short acting β-agonist use, small study group

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.

Asthma

• **Quercetin**
  • Bioflavonoid with anti-inflammatory, antihistamine, anti-oxidative, and mast cell stabilizing effects
  • Adult patients with mild-moderate asthma
  • -Decreased asthma symptoms, short acting β-agonist use, improved peak flow

Gupta P, Sheth, D et al. Asthma and Evidence-Based Integrative Medicine, manuscript in preparation.
Allergic Rhinitis

- **Probiotics:**
  - *Bifidobacterium*: gram positive, GI tract
  - Children with seasonal allergic rhinitis, *Bifidobacterium* treated, improved symptoms and quality of life
  - Adults with perennial allergic rhinitis, *B. longum* and *L. plantarum*: improved nasal symptom scores
  - *Lactobacillus helveticus* has also been used
  - Probiotics have been used in combination with subcutaneous allergen immunotherapy and sublingual allergen immunotherapy


---

Allergic Rhinitis

- **Vitamin E:**
  - Study: Adults with Allergic Rhinitis
  - Randomized to vitamin E (800 mg/day) or placebo
  - Nasal symptom scores were lower
  - Ocular symptoms scores revealed no changes.

Health-interlink.com
Urticaria

• **Vitamin D$_3$:**
  - Study: Adults with Chronic Urticaria
  - Double-blinded, prospective study
  - 4000 IU/day or 600 IU/day, added to cetirizine, ranitidine, and montelukast
  - 12 weeks
  - Decrease in urticaria symptom scores in 4000 IU/day Vitamin D group


Atopic Dermatitis

• **Vitamin D:**
  - One study reviewed randomized controlled trials with Vitamin D and atopic dermatitis
  - SCORAD index and EASI scores, in general, decreased with vitamin D supplementation

Atopic Dermatitis

• Zinc:
  • One systematic review assessed studies on zinc supplementation and atopic dermatitis
  • Conflicting results
  • Low serum, hair, and erythrocyte zinc levels are associated with atopic dermatitis.


Atopic Dermatitis

• Omega Fatty Acids
  • One study revealed higher second trimester omega-6 polyunsaturated fatty acids were associated with atopic dermatitis in children of atopic women.

Atopic Dermatitis

- Probiotics

- Probiotic therapy, including *Lactobacillus salivarius*, *Bifidobacterium brevi*, *Lactobacillus acidophilus*, have shown clinical benefit in children and adults with atopic dermatitis.

- Limited data

- Unknown optimal dosing


Conclusions

- Not a lot of data on efficacy

- Discuss with patients the scientific studies (or lack of)

- Discuss with patients potential benefits, side effects, as well as toxicities of vitamins and supplements

- The allergist/immunologist should be the patients’ resource for vitamins and supplements and other complementary therapies, as opposed to other sources (internet, social media, etc.)
Thank You

• ACAAI
• ACAAI Integrative Medicine Committee
• Gary K. Soffer, MD
• Joseph P. Forester, DO
• Puneet Shroff, MD
• Randy J. Horwitz, MD, PhD
• Allergy and Immunology Colleagues

• anilnanda@yahoo.com