Pediatric Pearls: Dietary Supplements

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Disclosure info

I receive royalties from 4 books: *The Holistic Pediatrician; Mental Health Naturally!; Addressing ADD Naturally; Authentic Healing*

*I do not receive funds from any other commercial or industry source.*
Objectives

• Describe supplements most often used to correct deficiencies

• Describe risks and benefits of DS for common conditions such as ADHD, upper respiratory infections, anxiety/depression

• Use evidence-based resources to answer patients’ questions
Integrative Approach

Personalized Care

Biofield

Biomechanical

Biochemical

Healthy Habits

Healthy Habitat
Healthy Habits in a Healthy Habitat!

Dietary supplements do **not** replace
- Good nutrition
- Exercise/ rest
- Emotional self-regulation
- Fellowship
- Spirituality (meaning, purpose, connection)
- Healthy environment
FOOD > Pills
## Ethical Framework for Therapies

<table>
<thead>
<tr>
<th>SAFE</th>
<th>EFFECTIVE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>Use/Recommend (2+ L.RCTs)</td>
<td>Tolerate</td>
</tr>
<tr>
<td>NO</td>
<td>Monitor Closely</td>
<td>Advise Against</td>
</tr>
</tbody>
</table>

Routinely used supplements for babies

**Vitamin K**
- Prevent hemorrhagic disease of the newborn
- Typically im, not po

**Vitamin D**
- 400 IU daily for breastfed babies
- 1 liter formula daily provides 400 IU
- Test and start moms prenatally (cord blood deficiency -> increased risk RSV and LRTI; pre-term birth, pre-eclampsia, gest DM, wheezing, allergies, eczema)
Vitamin D: tissues and conditions

<table>
<thead>
<tr>
<th>Steroid hormone</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bones</td>
<td>• Rickets</td>
</tr>
<tr>
<td>• Brain</td>
<td>• Depression, psychosis, autism</td>
</tr>
<tr>
<td>• Muscles</td>
<td>• Weakness, fatigue, pain, HA, falls</td>
</tr>
<tr>
<td>• Immune System</td>
<td>• URTI, Flu, LRTI; wheeze, allergies; MS; Crohn’s, RA, Type 1 DM</td>
</tr>
<tr>
<td>• Breast/ovaries/prostate/colon</td>
<td>• Cancer</td>
</tr>
<tr>
<td>• Cardiovascular</td>
<td>• Hypertension</td>
</tr>
</tbody>
</table>
Vitamin D Insufficiency

• Risk factors
  – Darkly pigmented skin; covered
  – Obesity
  – Indoor lifestyle (gamers); lengthy hospitalization; institutionalization
  – CF, Crohn’s, hepato-renal disease
  – Meds: Phenobarb, valproate, ketoconazole
  – Sunscreen adherent
  – Winter
  – Live in Northern latitudes

• Screen for kids with
  – Pain
  – Depression
  – Fatigue
  – Frequent respiratory conditions
  – Pallor
# 25 (OH) Vitamin D levels

<table>
<thead>
<tr>
<th>Ng/ml</th>
<th>Toxicity/sufficiency</th>
<th>Prevalence (NHANES and KK data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;150 ng/mL</td>
<td>Toxicity</td>
<td>Rare</td>
</tr>
<tr>
<td>100 ng/mL</td>
<td>Maximum safe upper limit</td>
<td>Rare</td>
</tr>
<tr>
<td>40-70 ng/mL</td>
<td>Ideal</td>
<td>10%</td>
</tr>
<tr>
<td>&gt;30 ng/mL</td>
<td>Sufficient</td>
<td>25%</td>
</tr>
<tr>
<td>21-29</td>
<td>Insufficient</td>
<td>45%</td>
</tr>
<tr>
<td>&lt;20</td>
<td>Deficient</td>
<td>20%</td>
</tr>
</tbody>
</table>
Other frequently under-consumed nutrients

• **Iodine**: About 50% of women of child-bearing age are insufficient; 9% of kids 6 and under

• **Iron**: 65% of my consult patients have low ferritin; NHIS says 7% of toddlers are deficient (Minimum intake 7-15 mg daily; take with Vit C)
  – ADHD, poorer than expected cognitive performance
  – Depressed, Fatigued, Weak
  – Pale, Pica; headaches; tachycardia; sore tongue; brittle nails/hair

• **Magnesium**: > 50% of teens consume < RDI
  – Anxious, irritable, constipated
What is the RDI for Magnesium for teens?

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>410 mg/day</td>
<td>360 mg/day</td>
</tr>
</tbody>
</table>

HOW MANY Enzymatic Reactions does Mg play a role:
>300

3 good food sources?
- dark green leafy veggies
- nuts such as almonds and cashews
- peas and beans
- soy
- whole grains
- bananas, apricots, avocados
### Conditions and Diseases that may Increase Nutrient Needs

<table>
<thead>
<tr>
<th>Health Condition</th>
<th>Increased needs for Essential Nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disorders of Eating (anorexia, bulimia) or appetite (cancer, HIV, inflammatory disorders)</td>
<td>Thiamine (B1), Riboflavin (B2), Niacin (B3), Folate,</td>
</tr>
<tr>
<td>Epilepsy, pyridoxine-related</td>
<td>Pyridoxine (B6)</td>
</tr>
<tr>
<td>GI Disorders (e.g., celiac, Crohn’s, ulcerative colitis) and malabsorption</td>
<td>Thiamine (B1), Riboflavin, B2, Pyridoxine (B6), B12, Folate, Vitamin C, Vitamin D, Vitamin E, Iron, Magnesium, Zinc</td>
</tr>
<tr>
<td>Liver disease</td>
<td>Thiamine (B1), Riboflavin, B2, Vitamin D</td>
</tr>
</tbody>
</table>
## Conditions and Diseases that may Increase Nutrient Needs (s)

<table>
<thead>
<tr>
<th>Health Conditions</th>
<th>Increased needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health, mood, anxiety, ADHD</td>
<td>Pyridoxine (B6), B12; folate may help, too</td>
</tr>
<tr>
<td>Obesity</td>
<td>Pyridoxine (B6), Vitamin D</td>
</tr>
<tr>
<td>Pigmented skin (darker)</td>
<td>Vitamin D</td>
</tr>
<tr>
<td>Premature infants</td>
<td>Vitamin A, Vitamin D, Iron</td>
</tr>
</tbody>
</table>
Colic

- Chamomile (Manzanilla) – common, few studies
- Gripe water (dill) – common, few studies
- Israel combination (chamomile, lemon balm, fennel, licorice, vervain) + RCT (Weizman Z. *J Pediatr*, 1993)
- Italian combination (chamomile, fennel, lemon balm): RCT showed significant improvement in crying (Savino, 2005)
- **Probiotics** (*L. reuterii*) V. Sung 2013 meta-analysis of 12 studies suggest possible benefits; more rigorous research needed to compare different products and doses; side benefit in premies – helps prevent NEC and sepsis (SE Jacobs. *Pediatrics*, 2013)
IBS (Irritable bowel syndrome)

- Enteric-coated peppermint (Pepogest) + RCTs (Kline RM, *J Pediatrics*, 2001)
- Iberogast (multiple herbs including chamomile, milk thistle, caraway, lemon balm, licorice) + RCTs in adults
- **Probiotics**: *Bifidobacterium infantis* 35624 (Align), LGG (Culture) are helpful. LGG is comparable to specific carbohydrate diet
ADHD

- **Caffeine** (coffee, tea) – not as strong as Ritalin, but easier to adjust doses
- **Iron** supplements if ferritin is low
- Consider **zinc** if poor diet
- **Melatonin** for sleep, not daytime behavior
- **AD-FX** (Ginkgo+ ginseng) – 1 +RCT in kids
- **Omega-3 fatty acids** (meta-analysis of 10 trials suggest benefits) of 1-2 grams daily of EPA+DHA
- Insufficient data to recommend: Carnitine, Magnesium, Gingko, pycnogenol
- **Negative trials**: St. John’s wort
Colds and Flu - prevention

**Supplements**
- Keep vitamin D optimal
- Ginseng (Cold-FX) as preventive (adult studies)
- Garlic preventive (adult data)
- Vitamin C, at least 200 mg daily – 14% reduction in colds in kids; more effective in kids than adults
- Probiotics (LGG and others) YES
- Echinacea – maybe; up to 8 weeks daily

**Other**
- Sleep at least 8 hours/day
- Moderate exercise (not marathon running)
- Positive emotions
- Social support
- Meditation
- Sauna?
Colds and Flu - *treatment*

- Andrographis paniculata – yes (KalmCold 200 mg/day used in study)
- Elderberry for flu – adults 4 TBL daily; need pediatric studies
- Pelargonium – positive adult study on severity and duration; need pediatric data
- Vitamin C – NSD; tolerate
- Zinc – maybe if taken in 1st 24 hours (adult data); avoid deficiencies, avoid intranasal use, avoid choking hazards
- Echinacea – NSD; tolerate
- Honey – helps with cough; not for infants <1 yo
- Vicks Vapo-Rub – helps with symptoms
Thanks to Gene Arnold, MD for slide
Percent of U.S. Population *Not* Getting the Dietary Recommended Intake --US FDA
Anxiety

- Optimize vitamin D and iron
- Omega-3 (1000-2000 mg/day EPA+DHA)
- Kava kava, WS1490 (German product, most studied)
- Lavender (aromatherapy)
- Magnesium (400 mg/day for teens)
- Melatonin – pre-op anxiety adults
- Inositol – maybe (mixed data)
- Rhodiola – maybe (small adult study)
- Saffron – positive adult studies (30 mg daily)
- Theanine – positive adult studies (400 mg daily)
- 5-HTP – adult studies

Depression

- Optimize vitamin D and iron
- Omega-3 (1000-2000 mg/day EPA+DHA)
- Folate and optimize all Bs
- S-adenosylmethionine (SAM-E) 800 mg BID in teens
- SJW (900 – 1500 mg daily); phototoxicity; drug interactions
- Turmeric – maybe (1 adult study)
- 5-HTP – adult studies
Headache

- Butterbur (Petadolex in studies) 25 mg BID in adults; pyrrolizidine-free
- CoQ10 – 100 mg/day in pediatric migraine prophylaxis study; helpful if deficient
- Feverfew -25-50 mg/day in adults; burning or mouth ulcers, rebound headaches
- Ginger – nausea associated with migraine
- B2 200 mg/day migraine prophylaxis
- Magnesium citrate 400 mg/day
- Combos (B, MG, feverfew; feverfew + ginger)
- HIGH PLACEBO RESPONSE in HEADACHE patients
Free Resources

- Natural Medicines (Free at OSU)
- ConsumerLab ($$; fee-based) are free
- NIH NCCIH
- National Library of Medicine, MedLine Plus
- NIH Office of Dietary Supplements (fact sheets)
- *Pediatrics in Review* series
THANK YOU!