Disclosure

Objectives

- Explain the etiology of ADHD as it relates to nutrition interventions
- List 2 nutrients that may be recommended for supplementation
- Explain how nutrition-related research for children with ADHD is conducted
Diagnosis

No single test used to diagnose

American Psychiatry Association DSM-5 criteria¹

- Symptoms by age 12, present for 6+ months
- Occur in 2+ settings
- Inattention, hyperactivity, and impulsivity
- Interferes with functioning and development

1. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders

What is the difference between ADHD and ADD?

American Psychiatric Association DSM-5 criteria¹

- Combined
- Inattentive
- Hyperactive and impulsive

1. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders

Hallmarks

Impulsivity
Inattentiveness
Hyperactive

Creative
Innovative
Imaginative
Often super intelligent
Faces of ADHD

Michael Phelps - Olympic Swimmer
- Used swimming to help him focus

Richard Branson - Entrepreneur, billionaire
- Innovative, always using his imagination

Walt Disney
- Creative genius - surrounded himself by others to work out the details

Justin Timberlake
- Musical genius

Etiology

Widely accepted theory
- Altered neurotransmitter activity
- Not enough of dopamine or serotonin to control behaviors

Genetics


Etiology

Serotonin regulates brain activity
- Executive function
- Impulsivity
- Sensory gating - ability to filter out unnecessary external stimuli
- Social behavior

People with ADHD and similar disorders have decreased serotonin activity
Co-morbidities

2007 National Survey of Children’s Health (parent reports)

- Learning disabilities 46%
- Conduct disorder 27%
- Anxiety 18%
- Depression 14%
- Speech problems 12%

Presence of comorbid disorders can affect the presentation, diagnosis, prognosis, and treatment of ADHD.

Prevalence - ages 4-17

National Survey of Children’s Health

2003-2004: 9%

2011: 11%

More than twice as prevalent in boys than girls

Therapy

Medications

- Methylphenidate or amphetamine-containing medications
- Stimulants that act on dopamine receptors in the brain to increase available dopamine and neuronal activity

Behavioral

Nutritional

- Secondary interventions or primary therapy?
Nutrition Considerations

**Anthropometrics**

**Anthropometrics - Height**

Medication use can slow growth in height by 1 cm per year for the 1st 3 years of use.

- This is about 1 inch

Rebound growth may be possible if medications stopped

Due to the disease itself or the medication?

**Anthropometrics - Weight**

**Obesity**

Prior to treatment

- 1.5 x more likely to be overweight/obese
- Impulsive in many aspects of lifestyle, including eating
- Choose the immediate and easy foods

Prevention/management:

- Behavioral therapy for food-related behaviors
- Plan ahead for improved nutrient content of foods
Anthropometrics - Weight

Underweight
After Starting Medication Therapy
- Stimulant medications reduce appetite
- Children started on these medications have a 1.6 chance of being underweight

Prevention/Management:
- Behavioral therapy for food-related behaviors
- Plan ahead for improved nutrient content of foods
- Adjustment of medication dose and schedule

Nutrition Considerations
Individual Nutrients

Nutrition Research for ADHD
No standardized questionnaire
Perception of behavior
Hawthorne effect?
Structured interviews of parents
Sugar

Academy of Nutrition and Dietetics 2012 position statement:
- The use of nutritive and non-nutritive sweeteners does not affect behavior of children with or without ADHD

American Academy of Children and Adolescent Psychiatry:
- Does not address any dietary treatments for children with ADHD

Practice Tips
Encourage reduced intake of simple carbohydrates and sugars
Increase whole grains and complex carbohydrates

Artificial Food Colorings and Food Preservatives

1970s Kaiser Permanente Diet
aka Feingold Diet

Follow up studies conflicting

Practice Tips
RDNs discuss pros and cons with parents
Behavioral management and other nutrition interventions

Vitamin D

Deficiency common

Supplementation has been shown to improve inattention, hyperactivity, and impulsivity

<table>
<thead>
<tr>
<th>Food Source of Vitamin D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatty fish: tuna, mackerel, salmon</td>
</tr>
<tr>
<td>Vitamin D fortified foods: dairy products, orange juice, soy milk, cereals</td>
</tr>
<tr>
<td>Beef liver, egg yolks</td>
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</tbody>
</table>

Practice Tips
Check with physician 1st!
Supplement 4,000 IU/day IF deficient
Omega 3 Polyunsaturated Fatty Acids

One of the most studied nutrients related to ADHD

Decreased plasma levels in ADHD children

Supplementation studies show conflicting results

- Different dosages
- Differing content of EPA and/or DHA

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2012

Pregnant women with omega-3 rich diet less likely to have a child with ADHD-behavior

2012 Cochrane Review

- Little evidence exists that supplementation improves symptoms
- Limited data that combination Omega 3 + Omega 6 supplementation improves symptoms

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2014

Omega 3 supplement + methylphenidate increased benefit over methylphenidate alone

2015

Possibly need a supplement with both EPA and DHA

- Most promising: 650 mg DHA and 650 mg EPA fortified margarine
### Omega 3 Polyunsaturated Fatty Acids

<table>
<thead>
<tr>
<th>Study</th>
<th>Doses</th>
<th>Study Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belanger et al, 2009</td>
<td>500 – 1000 mg EPA and 100–400 mg DHA depending on the child’s weight</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Brouillette et al, 2013</td>
<td>Fortified margarine with 650 mg EPA and 650 mg DHA</td>
<td>16 weeks</td>
</tr>
<tr>
<td>Stevens et al, 2009</td>
<td>460 mg DHA and 80 mg EPA</td>
<td>17 weeks</td>
</tr>
<tr>
<td>Richardson &amp; Montgomery, 2009</td>
<td>158 mg EPA, 174 mg DHA</td>
<td>26 weeks</td>
</tr>
<tr>
<td>Sinn &amp; Bryan, 2007; Sinn et al, 2008</td>
<td>558 mg EPA, 174 mg DHA</td>
<td>30 weeks</td>
</tr>
<tr>
<td>Johnson et al, 2009</td>
<td>558 mg EPA, 174 mg DHA</td>
<td>26 weeks</td>
</tr>
</tbody>
</table>

**Omega 3 Polyunsaturated Fatty Acids**

EPA regulates serotonin release

DHA regulates serotonin receptor function

Different and complementary actions

**Omega 3 Polyunsaturated Acids**

Treatment effect of Omega 3 much lower than medications.

Medication + Omega 3 could reduce dosage of medications needed

**Practice Tips**

Check with physician 1st!

Supplement if deficiency confirmed or if diet history confirms low intake

Supplement both EPA and DHA
Exercise

Increases tryptophan transport across blood-brain barrier

Increases serotonin production

Multiple other benefits

Behavioral Nutrition Therapy

Eating Behaviors of Children with ADHD

Skip meals but eat 5+ times/day

Drink more sugar sweetened beverages

Fewer fruits and vegetables

More screen time, less organized sports time

Lower self-control in eating

Poor meal planning

Convenience foods, immediate choice
Behavioral Strategies for Nutrition

‘No’ means ‘no’

Avoid using food as a distraction

Make the healthy choice the easy choice

Avoid using food as a reward

Establish routines and expectations

Behavioral Strategies for ADHD

Focus on the positive

Allow for autonomy when possible

Build healthy habits to last a lifetime

Summary Recommendations

Avoid simple carbohydrates

Nutrition therapy +/- medication therapy

Most promising nutrients

Vitamin D

Omega 3 fatty acids

Support elimination diet trial if desired by the family

Behavioral nutrition therapy

Non-food rewards for positive behavior

Exercise
Credit Claiming

You must complete a brief evaluation of the program in order to obtain your certificate. The evaluation will be available for 1 year; you do not have to complete it today.

Credit Claiming Instructions:
1. Log in to www.CE.TodaysDietitian.com and go to “My Courses” and click on the webinar title.
2. Click “Take Course” on the webinar description page.
3. Select “Start/Resume Course” to complete and submit the evaluation.
4. Download and print your certificate.