

Nutrition and Mental Health

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Objectives

- Effect of Diet on Mental Health/ Illness
- Effect of Psychotropic Medications on Metabolism
- Foods that Affect the Effectiveness of Meds
- Food vs. Supplements
- Appropriate Diet for Mood Disorders
- Books/ Websites for Information

Effect of Diet on Mental Illness

- Fats (Omega-3 Fatty Acids)
- Protein (Tryptophan)
- Carbohydrate

Types of Fats

- Essential Fatty Acids
 - Body is not able to manufacture, must get from diet
 - Linoleic Acid (omega-6 fatty acid)
 - Alpha-Linolenic Acid (ALA, omega-3 fatty acid)
- Non-Essential Fatty Acids
 - Body can manufacture
 - Oleic acid (omega-9 fatty acid)

Essential Fatty Acids

- Required to build and maintain the tissue encasing the nerves in the brain (myelin sheaths), which are crucial for transmission of signals between the brain and the rest of the body
- Deficiency of EFA affects neurotransmission, including serotonin

Sources of EFA

- Best sources
 - Fatty fish – salmon, herring, mackerel, sardines, anchovies

Fatty Acids and Depression

- Martinez and Marangell:
 - As fish consumption increases, the prevalence of major depression, and suicidal depression decrease
 - Omega-3 fatty acid deficiency shown in serum of depressed/ manic patients compared to control group
 - Actions of EPA and DHA resemble actions of lithium and valproate (Depakote)
 - Omega-3 fatty acids used as adjunct are well tolerated and safe in psych disorders

Fatty Acids and Depression

- Patients on standard antidepressants who remained depressed were placed on 1, 2, and 4 grams of EPA. 53% of patients on 1 gram dose showed 50% decrease in Hamilton Depression Scale (Peet and Horrobin).
- Patients who screened positive for depression had higher ratio of omega-6 to omega-3 fatty acids (Tiemeier, et al)

Fatty Acids and Bipolar Disorder

- In thirty patients with bipolar disorder, DHA levels were lower in severely depressed patients. Provision of DHA supplement served as mood stabilizer (Stoll). Concluded that deficiency of omega-3 fatty acids may be related to depression.

Fatty Acids and Schizophrenia

- Peet, Malcom et al. found that phospholipids and EFA were depleted in red cell membranes of schizophrenic patients compared with control subjects
- Changes in diet (increase in EFA) are shown to modify membrane levels and have positive effects on symptoms and tardive dyskinesia in six weeks

Dietary Intake of Omega-3 Fats

- American Heart Association recommends 1000 mg daily (EPA plus DHA)
- Fish with highest levels: herring, mackerel, bluefin tuna (1500 mg EPA and DHA per 3-4 oz)
- Avoid high mercury fish (shark, king mackerel, swordfish, tile fish)

Other Sources of Omega-3 Fats

- Sources of ALA:
 - Flaxseed (oil or ground)
 - Walnuts
 - Wheat germ
 - Canola oil
 - Soybean oil

Omega-3 Supplements

- 1000 mg daily of combination of EPA and DHA
- Available in various combinations:
 - Ex. 500 mg capsules twice daily
 - Best to have 3:1 ratio of EPA:DHA
- Caution:
 - EFA may lead to increased bleeding time, delayed wound healing, suppression of immune system
 - Avoid if taking Coumadin

Tryptophan

- Amino acid
- Precursor to Serotonin
- High protein diet \neq more serotonin

Tryptophan

1. Carbohydrate intake
2. Insulin release
3. Causes all other amino acids to be taken up by cells throughout the body
4. Tryptophan stays in higher concentration in the brain
5. More serotonin produced

Serotonin

- Increased amounts of serotonin available to nerves:
 - better impulse control
 - decreased irritability
 - less feelings of depression
 - increased relaxation and ability to sleep
 - Fewer cravings for sweets
 - Decreased tendency toward aggression

Serotonin

- Even a small amount of protein (4%) in a high carbohydrate meal is sufficient to block a meal-induced increase in the ratio of plasma tryptophan to other amino acids

5-Hydroxytryptophan (5-HTP)

- Tryptophan is converted to 5-HTP before it is converted to serotonin
- 5-HTP is currently being investigated as an alternative to antidepressants to treat unipolar depression and dysthymia – findings as of yet are inconclusive
- Individuals who took 5-HTP for depression lost weight, felt greater sense of satiety after eating

Carbohydrate

- Preferred fuel for the brain and central nervous system
- Your brain runs on glucose
- Glucose circulates in blood to provide energy, and is stored in the muscle and liver as glycogen

Carbohydrate

- Minimum of 100-130 grams of carbohydrate is necessary daily to provide glucose for the brain and nervous system
- More is needed for active people

Carbohydrate

- Normal blood sugar levels 50-100 mg/dL
- Hypoglycemia: blood sugar less than 50 mg/dL
- Reactive hypoglycemia: simple carbs (sugar) trigger overabundance of insulin, causes blood sugar to drop

Carbohydrate

- Symptoms of hypoglycemia:
palpitations, shakiness, sweating, hunger, confusion, drowsiness, inability to concentrate, speech difficulty, blurred vision, anxiety, nervousness, crying, fainting, headache, personality changes

“Sugar Busters” Diet

- Decrease in blood sugar triggered by reactive hypoglycemia can aggravate depression
- Based on glycemic index (GI) – how much does a specific amount of carbohydrate cause a person’s blood sugar to rise over a specific period of time?

“Sugar Busters” Diet

- Following GI can be tedious and complicated
- Overall, choosing whole grains over refined grains is better for your health, regardless of GI
- For weight loss, watching portion sizes is more important than calculating GI of foods

Eliminating Sugar

- Eliminating sugar from the diet is ideal
- For those with mental illness, making dietary changes, especially eliminating certain foods, can cause anxiety and depression
- Make small changes:
 - Eat fruit for dessert
 - Eat fruit in place of fruit juice/ drinks
 - Decrease frequency of sweets
 - Listen to your body

Soda (Regular and Diet)

- Dark sodas (Coke and Pepsi) contain phosphoric acid, which leaches calcium from bones, can contribute to osteoporosis
- Switch from regular to diet sodas (including Ginger Ale, 7Up, Sprite), if possible
- Ideal to eliminate soda completely
- Try flavoring water with lemon juice, cranberry juice, etc

Sugar Substitutes

- Aspartame (Equal or Nutrasweet)
 - 200 times sweeter than table sugar
 - Contraindicated in phenylketonuria (PKU)
 - Approved by FDA in 1981
 - Has been linked to headaches in some individuals
 - Considered safe overall
 - Contains some carbohydrate
 - Can cause slight rise in blood sugar

Sugar Substitutes

- Saccharin (Sweet 'n' Low)
 - 300 times sweeter than table sugar
 - Came on the market before FDA approval necessary
 - Found to cause bladder cancer in rats
 - FDA allows it to remain on market

Sugar Substitutes

- Acesulfame Potassium (Acesulfame-K)
 - “Sunette” or “Sweet One”
 - 200 times sweeter than table sugar
 - Found in diet drinks
 - Must limit on potassium-restricted diet
 - FDA considers it safe

Sugar Substitutes

- Sucralose (Splenda)
 - 600 times sweeter than table sugar
 - Made from sucrose (sugar)
 - Approved by FDA in 1998
 - Can be used in baking

Sugar Substitutes

- Neotame
 - Made by Nutrasweet
 - Approved by FDA in 1998
 - Not widely used

Sugar Substitutes

- Stevia (Truvia, Purevia)
 - Herb native to South America
 - Used for centuries
 - Not yet approved by FDA

Sugar Substitutes

- Useful for individuals with diabetes
- Not all of them considered safe
- Not necessarily beneficial for weight loss
- Increase threshold for sweet, may cause carbohydrate cravings

Psychotropic Meds and Metabolism

- SSRI's (Antidepressants)
- Tricyclic Antidepressants
- MAOI's (Antidepressants)
- Anticonvulsant Mood Stabilizers
- Conventional Mood Stabilizers
- Traditional Antipsychotics
- Atypical Antipsychotics

SSRI's

- Prozac
- Zoloft
- Paxil
- Luvox
- Celexa

SSRI's

- Initial loss of appetite and weight loss
- Long term weight gain
- Most significant weight gain with Paxil
- Sometimes hypoglycemia or feeling hungry – may be related to increased insulin

Tricyclic Antidepressants

- Elavil
- Asendin
- Pamelor
- Tofranil
- Anafranil

Tricyclic Antidepressants

- May cause carbohydrate cravings
- May cause slowing of metabolism
- Appetite stimulation
- Weight gain
- Most weight gain shown with Tofranil and Elavil

MAO Inhibitors

- Nardil
- Parnate
- Manerex
- Humoryl

Anticonvulsants/ Mood Stabilizers

- Depakote
- Tegretol
- Neurontin
- Topamax
- Lamictal

Conventional Mood Stabilizers

- Lithium

- $\frac{1}{2}$ to $\frac{2}{3}$ of patients gain weight
- 25% become obese
- Effect is dose-dependent

Traditional Antipsychotics

- Thorazine
- Mellaril
- Haldol
- Moban

Atypical Antipsychotics

- Clozaril
- Zyprexa
- Risperdal
- Seroquel
- Zeldox

FDA Warning – Atypical Antipsychotics

- Warning from FDA and Janssen that there is an increased risk of hyperglycemia and diabetes in patients taking Risperdal
- Diabetes increasing in general population
- Risk of diabetes higher in schizophrenics
- Recommendations: those taking atypicals undergo regular fasting blood sugar monitoring

Ways to Prevent/Limit Weight Gain

- Eat slowly – take 20 minutes to finish first portion of meal
- Eat low calorie foods such as fruits, vegetables, salads
- Encourage high fiber foods
- Limit access to high calorie foods
- Emphasize low fat and fat free condiments
- Drink 6 to 8 8-oz cups of water daily

Glucophage and Weight Loss

- Glucophage is a drug used to manage diabetes
- Eat – sugar goes from intestine into bloodstream, then to liver, liver releases sugar into bloodstream, pancreas releases insulin into bloodstream
- Insulin causes hunger, causes liver to convert extra calories to fat
- Glucophage helps diabetics lose weight by reducing hunger, decreasing release of sugar from the liver, reducing release of insulin from the pancreas

Glucophage and Weight Loss

- Must decrease simple carbohydrates in diet
- If too many simple carbs (white bagels, pasta, bread, sweets, fruit juices) are consumed, blood sugar and insulin levels will rise rapidly, causing weight gain
- Recommend eating fruits and starchy vegetables with meals only

Glucophage and Weight Loss

- May be beneficial for patients with diabetes on psych meds for weight loss
- Psych meds cause increased appetite, carbohydrate cravings, increase in insulin levels
- Warnings: do not take if you have kidney and/or heart disease

Drug-Nutrient Interactions

- Lithium:
 - Lithium and sodium reabsorbed at the same sites in the kidney
 - High sodium intake increases sodium and lithium excretion, low sodium intake increases sodium and lithium retention
 - Best to keep sodium intake consistent to keep lithium levels in therapeutic range
 - Drink 2-3 liters water daily
 - Moderate caffeine intake

Drug-Nutrient Interactions

- MAO Inhibitors:
- Dietary restriction of tyramine:
 - Aged cheeses
 - Red wine yeast extracts
 - Smoked or pickled MFP
 - Fermented sausage, bologna, salami
 - Fava beans
 - Sauerkraut
 - Overripe fruit
 - Alcohol/caffeine

Drug-Nutrient Interactions

- Avoid grapefruit with Geodon
- High fiber diet may decrease absorption of Elavil
- Caffeine inhibits metabolism of Clozaril and increase drug levels

Diet vs. Supplements

- Take multivitamin to complement your diet
- Provides folate, vitamin B6 & B12, vitamin D
- Most multivitamins provide 400 IU of vitamin D (800 to 1000 IU recommended)
- Can take vitamin D supplement, or Calcium with vitamin D
- Calcium:
 - 1000 mg daily for women 31-50 years
 - 1200 mg daily for women 51+ years

Diet for Mood Disorder

- Overfocused anxiety and depression:
 - characterized by excessive worrying and negative thoughts
 - High protein, low carbohydrate diet may increase dopamine levels, cause more negative thoughts
 - Appropriate to increase carbohydrate in relation to protein to increase serotonin levels

Overall Dietary Recommendations

- Include some kind of protein at each meal and snack
 - Will increase satiety, decrease carb cravings
 - Helps with weight control
 - Protein will help wake you up at breakfast
- Always eat breakfast
 - Lowfat cottage cheese + fruit
 - Eggs + whole wheat toast
 - Oatmeal + lowfat milk
 - Avoid sugary cereals

Overall Dietary Recommendations

- Avoid simple carbs
- Focus on whole grains:
 - Baked sweet potato
 - Whole wheat bread (1 slice)
 - ½ cup oatmeal or grits
 - ½ cup whole wheat pasta
 - ½ cup beans
- Minimize fruit juice or have with meal
- Eat fruit in abundance, but with protein or meal

Overall Dietary Recommendations

- Increase omega-3 fatty acids
 - Walnuts, flaxseed, fatty fish, supplements
 - Preferably 1000 mg EPA + DHA daily

Books/ Websites for Information

- Eat, Drink, & Be Healthy – Walter C. Willett, M.D.
- Food and Mood – Elizabeth Somer, M.A., R.D.
- www.joybauer.com
- www.webmd.com
- www.drmirkin.com
- www.eatright.org
- www.obesity.com

References

1. Amen, D.G., & Routh, L.C. (2003). Healing Anxiety and Depression. New York: Berkley Books.
2. Leyse-Wallace, R. (2008). Linking Nutrition to Mental Health. Lincoln: Ruth Leyse-Wallace.
3. Steward, H.L., Andrews, S.S., Bethea, M.C. & Balart, M.C. (2003). The New Sugar Busters: Cut Sugar to Trim Fat. New York: Ballantine Books.
4. Willett, W.C. (2001). Eat, Drink, & Be Healthy. New York: Simon & Schuster.