Malnourished Minds: The Importance of Nutritional Supplementation in Recovery

Cigna Awareness 2018

James Greenblatt, MD
Chief Medical Officer of Walden Behavioral Care
29-year-old depression, and substance abuse since age 13
Involuntarily committed in New Jersey in 2014
Her doctors argued she was unlikely to recover and force-feedings would be “inhumane”

44-year-old woman. “Unbearable mental suffering from anorexia nervosa”
Her psychiatrist granted her death wish

Netherlands mid-20 year old began to suffer from anorexia and PTSD 15 years ago following sexual abuse
Doctors considered her “resistant to treatment”
“My childhood was perfection. It was full of vacations and love and family time. Something must have been lacking that no one was aware of. Something must have gone wrong. Maybe it was puberty.”
First degree relatives of individuals with AN are 10X more likely to have AN than relatives of unaffected individuals.

First-degree relatives of individuals with BN have approx. a 12-fold greater lifetime risk of having AN than relatives of unaffected individuals.
Epigenesis

Changes that influence development without altering the genetics

Genetics as a Biological Liability

Not Destiny
The Teen Brain: STILL UNDER CONSTRUCTION
Neurodevelopmental Changes
Dietary Changes

50% of patients diet before the onset of the eating disorder

A change in diet often precedes the onset of an eating disorder

Fuel for Thought?
Vegetarian and Eating Disorders

The number of publications discussing vegetarianism and eating disorders has risen steadily since the 1980’s.

Over 1,200 publications to date


www.waldeneatingdisorders
Vegetarianism and Eating Disorders

68% of Eating Disorder patients felt there was a relation between vegetarianism and their eating disorder

“To lose weight and eliminate calories”

Past vegetarianism reduces the chance of remission by a factor of 12.8

“Non-Vegetarians”

I am a “functional vegetarian”
Symptoms

**Anorexia Nervosa**
1. Decreased appetite and meat avoidance
2. Decreased taste and smell
3. Nausea and bloating during re-feeding
4. Insomnia and poor sleep habits
5. Depression
6. Attention difficulties

**Zinc Deficiency**
1. Decreased appetite and meat avoidance
2. Decreased taste and smell
3. Nausea and bloating during re-feeding
4. Insomnia and poor sleep habits
5. Depression
6. Attention difficulties
The Link to Zinc

45 Israeli outpatients with AN age 13-21 years and 165 controls

96% of patients avoided beef

“Meat Avoidance”

56% became vegetarians several years prior to the onset of AN

The Link to Zinc

At admission, all patients were zinc deficient, independent of diet status.

“Meat avoidance is likely to perpetuate low zinc status, destabilize normal eating patterns, and facilitate the development of an eating disorder.”

Taste

Zinc deficiency alters taste and smell receptors.

Taste is mediated through a salivary zinc dependent enzyme.
Digestion

Enzyme

Trypsin
Chymotrypsin
Elastase
Carboxypeptidase
Lipase
Amylase
Maltase
Sucrase
Lactase
Pepsin

Protein
Fat
Carbohydrate

Gastric Acid
Sleep Disturbances in Eating Disorders

Those with sleep disturbances scored worse on drive for thinness, impulse regulation, and social insecurity.

Poor Sleep  Severity of ED Symptoms

Sleep

L-tryptophan → TPH → 5-HTP → AADC → Serotonin → Melatonin

- Folate (5-MTHF)
- Vitamin B6 (P5P)
- Zinc

Vitamin D

Melatonin → Zinc
Depression

Meta-analysis of 17 studies measuring peripheral blood zinc concentrations in 1643 depressed and 804 control subjects

Zinc concentrations were lower in depressed subjects than control subjects

Depression is associated with a lower concentration of zinc in peripheral blood

Swardfager, W., Herrmann, N., Mazereeuw, G. et al. (2013) Biol Psychiatry, 74(12):872-8
Summary Zinc Supplementation

6 studies: 71 AN patients

Daily zinc dosages: 45-220 mg zinc sulfate; 100 mg zinc gluconate

Treatment durations: 1 month – 2 years

Outcomes: ↓ depression and anxiety, ↑ appetite and weight gain, resolution of skin problems, return of menstruation
For zinc supplementation there is a grade B evidence for AN. For olanzapine there is a category grade B evidence for weight gain. For the other atypical antipsychotics there is grade C evidence.”
Zinc Status After Treatment
Causes of Zinc Deficiency

- Low calorie intake
- Celiac Disease
- Exercise

- Puberty
- Stress
- Estrogen/Birth Control Pills

- Vegetarianism
- Environmental Toxins
Zinc

ZINC AND EATING DISORDERS

DISCOVER THE FASCINATING ROLE OF A MINERAL NUTRIENT IN ANOREXIA NERVOSA, BULIMIA, OBESITY AND PICA
Celiac Disease

Researchers in Sweden compared the medical records of 18,000 women with celiac disease to records of 89,000 women without celiac disease.

After a celiac disease diagnosis, women were 46% more likely to be diagnosed with anorexia nervosa.

After an anorexia diagnosis, women had twice the odds of a later diagnosis of celiac disease.

Malorexia

**Zinc Deficiency**

- Depression
- Attention difficulties
- Decreased appetite
- Meat avoidance
- Amenorrhea
- Inhibition of EFA metabolism
- Decreased taste
- Changes in opioid receptors
- Vulnerability to stress
- Change in brain chemistry
- Decreased melatonin
- Nausea
- Bloating GI discomfort
- Decreased pancreatic enzymes

MALNOURISHED MINDS
How Can I Help?

Digestion/Taste
Anxiety
Sleep
Depression
“I started taking the liquid zinc and after three days I had an appetite...

I felt hungry...

I was scared...

I stopped the zinc.”
Fats of Life
Fat Deficiency Disorder

Essential Fatty Acid Deficiency

- Anxiety
- Depression
- Suicide Risk
- Psychosis
- Distorted Perceptions
- GI problems
- Aggression
Delusion

“a persistent false psychotic belief regarding the self or persons or objects outside the self that is maintained despite indisputable evidence to the contrary”

– ”FIXED FALSE BELIEF”

Saline flushes – feel it in my thighs – ED voice
Psychosis

81 young adults aged 13-25 at ultra-high risk of psychotic disorder
700 mg of EPA, 480 mg of DHA, for 12 weeks

After 12 months:

4.9% in omega-3 group and 27.5% in placebo group had transitioned to psychotic disorder

Amminger. Arch Gen Psychiatry. 2010 Feb;67(2):146-54
Psychosis

71 of original 81 subjects followed for 7 years:

Cumulative conversion rate for psychosis was 9.8% in omega-3 group vs. 40% in the placebo, with more rapid conversion time in the placebo group

Difference between the groups in the cumulative risk of progression to psychosis was 30.2%

Omega-3 group had significantly higher functioning vs placebo

29.4% of omega-3 group and 54.3% of placebo group were being prescribed antipsychotic medication

Eating Disorders and Suicide

Individuals suffering from eating disorders are **5x more likely to die as a result of suicide**, than as a result of the eating disorder itself or complications arising from it.

Omega-3 and Suicide

800 U.S. servicemen and women who committed suicide between 2002 and 2008

Those with **low blood levels of DHA** were 62% more likely to have been **suicide victims** than those with the **highest levels**

80% WERE NEVER DEPLOYED OR IN COMBAT

BRAVO Study

Researchers conservatively estimate that 20% of subjects in the placebo group will re-attempt suicide during the study period and this will be reduced to at least 8% in the omega-3 group.

20% VS. 8%

$10 million from the DOF
K-Rations

Breakfast

Supper

Dinner

www.waldeneatingdisorders.com
EPA Supplementation in Anorexia Nervosa

AN patients received 1g EPA/day for 3 months

43% recovered

57% showed improved symptoms in:

- Weight gain
- Reversal of growth retardation
- Improvement in mood
- Improvement in general functioning

The Development of Eating Disorders

Genetic Vulnerability

Temperament → Eating Disorder

Stress

Excess Estrogen

Environmental Toxins

Puberty

LBW

Nutritional Deficiencies

SAD

Strenuous Physical Activity

Eating Disorders
Probiotics
Gut Bacteria and Eating Disorders

- Stress tolerance
- Anxiety
- Depression
- Chronic GI complaints
- Weight

Politics and Gut Bacteria

A group of volunteers who did not generally eat or drink artificially sweetened foods

1 week consumption of artificial sweeteners caused alterations in the intestinal microbiota

Elinav et al. Nature 2014
Microbiota donors

GF animals

Donor weight — Normal — Obese — Underweight

Microbiota Transfer

Adoption of phenotype

Microbial Influences in Anorexia

**Behavior**
- Microbes produce neuroactive compounds
- Lower microbial diversity associated with depression in AN
- Mechanism(s) of brain-gut-microbiota axis remains elusive

**Body Fat**
- Microbial metabolites associated with adiposity
- Irregular body fat deposition in clinically re-fed patients diagnosed with AN

**Intestinal Tract**
- Irregular influx of calories and nutrients to the intestinal tract of patients with AN
- Altered fecal short- and branched-chain fatty acid concentrations in patients with AN

**Intestinal Microbiota**
- Lower fecal microbial diversity in AN
- Metabolites and gases produced by intestinal microbes may contribute to eating disorder symptoms

Microbiota After Treatment

16 AN inpatients and 12 healthy controls
Stool collected at admission and discharge
Patients with AN had significantly lower diversity than controls before and after treatment

Depression, anxiety, and ED psychopathology at admission associated with microbiota composition and diversity

Your Gut Bacteria May Be Sabotaging Your Diet

Understanding the role of Nutrition and Health is not Alternative Medicine. It Saves Lives.
99% constantly change.

We are a different creature every morning!

Microbial Genes outnumber humans 100%

We are only 1% human!
Hope

FOR SALE!
Psychiatry Redefined

Eating Disorders may be treated as a reflection of multiple errors in physiology.

If we discover the underlying biochemistry, we may find the Cures.

Prevention is Possible.
Thank You!

www.waldenbehavioralcare.com

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