The Effect of Food on Cognitive Function

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Food and Cognitive Function

- The role of food in cognitive function is well known but garners little publicity.
- Today, we will discuss how food affects the brain and what we can do to reverse the disturbing trend of a decline in cognitive function across the age spectrum.
- Children, teens, adults and the elderly are being affected by food trends that disturb cognitive function.
- We will present categories of foods to avoid as well as those which benefit healthy brain function.
- When you return home you will have the knowledge to better guide yourself and family in making the right choices.

Food and Cognitive Function

- Cognitive function is the set of all mental abilities and processes related to knowledge, attention, memory and working memory, judgment and evaluation, reasoning and "computation", problem solving and decision making, comprehension as well as language.
- The food you eat plays a key role in your brains ability to process thoughts.
- It is my firm belief, backed by solid science that many of the manufactured foods we have on our supermarket shelves has a detrimental affect on cognitive function throughout our society.

Cholesterol and Saturated Fat

- Cholesterol is not evil!!!
- Your brain needs cholesterol to function properly.
- Ancel Keys who proposed that cholesterol and saturated fat was the root cause of cardiovascular disease and obesity did more damage to our brains than football and the issue of concussions.
- In his “Seven Countries Study” he cherry-picked the countries that showed that those who ate the least amount of saturated fat had the lowest incidence of cardiovascular disease and visa versus.
- In Chile, where they eat little saturated fat, they had very high incidence of cardiovascular disease.

Cholesterol and Saturated Fat

- In my opinion, he purposely omitted outliers that would disprove his theory.
- He looked at 21 countries and left out most of them as they would have disputed his assumptions.
- According to an editorial in the journal Circulation in September 1999, low cholesterol, particularly under 160 mg/dl was seen as a risk factor for suicide, depression, accidents and some cancers.
- In 2008 in the *American Journal of Geriatric Psychiatry, "*In oldest old nondemented noncarriers of the APOE4 allele, high cholesterol is associated with better memory function."
- This was the opposite of what they expected to find.

Cholesterol and Saturated Fat

- The wide spread overuse of statin drugs may explain the epidemic of dementia and Alzheimer's disease in the west.
- Dr. David Permutter, author of the book, *Grain Brain*, says, "The brain thrives on a fat-rich, low-carbohydrate diet, which unfortunately is relatively uncommon in human populations today,"
- In their book, *The Great Cholesterol Myth*, Dr. Stephen Sinatra and Dr. Jonny Bowden come to the same conclusion.
- Dr. Ufe Ravinskov wrote about this decades ago.
- The real culprit?
- Sugar.

Carbohydrates and the Brain

- Eating sugar regularly, obviously is the leading cause of Type II diabetes.
- Type II diabetes is a known risk factor for dementia and Alzheimer's disease.
- But sugar is not the problem alone.
- So-called, "complex carbohydrates" may be worse as they stay in the system longer and cause insulin levels to stay high longer.
- The higher the food is on the glycemic index, the worse they are.

Carbohydrates, Fat and the Brain

- According to Dr. Permutter, "In a recent report in the Journal of Alzheimer's Disease, Mayo Clinic researchers showed that individuals favoring carbohydrates in their diets had a remarkable 89% increased risk for developing dementia as contrasted to those whose diets contained the most fat. Having the highest levels of fat consumption was actually found to be associated with an incredible 44% reduction in risk for developing dementia."
- This is a 133% differential in risk factors between high carbohydrates and high fat intake.
- Saturated fat is richest in mother's milk making breast feeding critical for the developing baby.

Carbohydrates, Fat and the Brain

- The FDA knows about this and is strangely silent.
- They ordered that certain cholesterol lowering drugs increase the risk for memory loss.
- Grass-fed meats, coconut oil, and pasture raised eggs are your friends as they have a good fat profile.
- Conventionally raised meats, eggs and manufactured oils have a poor fat profile.
- Real food equals better brains.
- Overly processed foods equals lowered cognitive function.

Coconut Oil

- Coconut oil is high in medium chain triglycerides (MCT) which has been shown to have fantastic benefits for the brain.
- In Alzheimer's patients, as little as 40 ml (2.7 teaspoons) had almost immediate improvement in cognitive performance.
- In the double-blind, placebo controlled study, benefits of taking coconut oil were seen within 90 minutes of ingestion.
- Using this oil is especially helpful in insulin resistant people as their brains are starved of glucose so it uses the MCT instead.

Organic versus Conventional Grown Fruits and Vegetables

- Aside from the nutritional differences, pesticide residue is a major problem.
- Many of the pesticides used have been shown to have a negative effect on cognitive function.
- The young and the old are most vulnerable.
- Accumulations over years is also an issue.
- In the journal, *Occupational and Environmental Medicine* in December 2002, one of the authors reported that "The mild impairment we observed raises the question of...possible evolution towards neurodegenerative diseases such as Alzheimer's disease or other dementias"

Organic versus Conventional Grown Fruits and Vegetables

- The studies of the year in 2012 from the highly influential journal, *Environmental Health Perspectives* were:
- Prenatal Exposure to Organophosphates, Paraoxonase 1, and Cognitive Development in Childhood
- Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year-Old Children
- 7-Year Neurodevelopmental Scores and Prenatal Exposure to Chlorpyrifos, a Common Agricultural Pesticide
- It is clear, eating organic food is critical for a lifetime of optimal cognitive function.

Electrolytes and the Brain

- The brain's electrical activity operates because of the sodium - potassium pump.
- Every thought and memory is dependent on this pump and the balance between these two important electrolytes.
- In today's processed food world, we have caused a dramatic imbalance between the two.
- Some have proposed that this imbalance may be one of the causes for an increase level of neurological disorders.
- Getting back to a real food diet will help to alleviate this problem.

Potassium

- Because every food we eat has potassium in it, we do not retain it.
- It is essential for the relaxation of muscles and helps one cope with stress.
- The more stress you are under, the more potassium you need.
- Potassium ion diffusion is a key mechanism in nerve transmission, and potassium depletion in animals, including humans, results in various cardiac dysfunctions.

Potassium

- Since our source of potassium is food, anorexics have notoriously low levels.
- Lower potassium will lead to an unrealistic self image.
- While it has been shown that zinc will increase appetites in anorexics, potassium is needed to straighten out the nervous system.
- A balanced electrolyte is crucial in this instance, especially one with little or no calories.
- You should not take potassium alone as in sufficient quantities it can cause heart arrhythmias.

Potassium

- Foods rich in potassium include yam, parsley, dried apricots, chocolate, various nuts (especially almonds and pistachios), potatoes, bamboo shoots, bananas, avocados, and bran, although it is also present in sufficient quantities in most fruits, vegetables, meat and fish.
- The daily recommended intake (DRI) according to the 2004 guidelines of the Institute of Medicine specify a DRI of 4,700 mg of potassium.
- It has been estimated that Americans only get half of that so we, as a people, are functionally deficient.

Potassium

- Italian researchers in 2011 reported that adding 1,640 mgs of potassium daily would decrease the risk of stroke by 21%.
- Deficiency is linked to diastolic (lower number) hypertension.
- Hypertension is linked to a number of cognitive deficiencies including dementia and Alzheimer's disease.

Sodium

- Sodium has been given a bad name over the years.
- Sodium is not just about blood pressure.
- The call for across the board reduction in sodium intake is a dereliction of public health duty and policy.
- It is essential for healthy brain function.
- As with any nutrient too much or too little is a bad thing.
- A balance is critical.
- Without it, your brain cannot function.
- Sodium is easily retained by humans.

Sodium and Potassium

- The DRI for sodium is 2,300 mgs per day.
- The average American ingests over 3,500 mgs per day.
- In my opinion, it is not the excessive intake of sodium that is the problem.
- It is the gross imbalance between sodium and potassium that is the real issue.
- We should be getting a ratio of 4.7 to 2.3 (potassium to sodium)
- The average America is at a 2.4 to 3.5 ratio.
- This is not sustainable for healthy cognitive function.

Proteins in Cognitive Function

- Protein and their constituent amino acids are vital in optimal cognitive function.
- Some amino acids like Taurine and Glycine are neuroprotective and neuroinhibitory.
- Some amino acids like Glutamic Acid and Aspartic Acid are neuroexcitatory.
- All are critical.
- It is when the balance is altered like it is with processed foods, we begin to see neurocognitive disorders rise in the population.

Proteins versus Carbohydrates

- In a 2002 study in the journal of *Physiology & Behavior* three different diets were studied.
- One had a 4:1 Carb to Protein
- One had a 1:1 ratio
- The third had a 1:4 ratio
- “a protein-rich or balanced meal seems to result in better overall cognitive performance presumably because of less variation in glucose metabolism and/or higher modulation in LNAA (large neutral amino acids) ratios indicated by the overall GIR (glucose to insulin ratio).”

Glutamate

- Glutamate is the most abundant excitatory neurotransmitter in the vertebrate nervous system.
- It is important in the proper function of the brain.
- When it is elevated beyond normal, we have problems.
- Excitotoxicity due to excessive glutamate release and impaired uptake occurs and is associated with stroke, autism, some forms of intellectual disability, and diseases like amyotrophic lateral sclerosis, and Alzheimer's disease.
- While it is found in every food with protein, it is when it is unbound that it can be tasted.

Glutamate

- In 1908 Japanese researcher Professor Kikunae Ikeda of the Tokyo Imperial University discovered a brown crystal that he later patented which we now know as MSG or monosodium glutamate.
- While it is naturally occurring, it has been transformed by the food industry as a food enhancer, making people eat more.
- The FDA has said that MSG "eaten at customary levels“ is safe, we see that this is not what the average American is getting.
- They are ingesting far more that a “customary level.”

Glutamate

- Critics who say that MSG is safe argue that everyone in China would have a headache if MSG wasn't safe.
- That is because they eat it through foods high in the substance, not enhanced with the glutamate salts.
- Foods high in glutamate include processed foods like ham, bacon and luncheon meats.
- It has been suggested that low levels of this can cause loss of brain neurons.
- This is more likely to happen in the most vulnerable, children and the elderly.

Aspartic Acid

- Also known as Aspartate, it is an essential amino acid found in all protein sources.
- It is essential for proper brain function.
- Low levels have been associated with chronic fatigue syndrome.
- It is when used in high quantities that we begin to have the same problems that we do with glutamate.
- Aspartame, aka Nutrasweet in small quantities, is not a problem for those who are not sensitive.
- It is when it is overused that we have problems.

Aspartame

- As we have seen, in America, we tend to overindulge.
- Artificial sweeteners, cause an insulin response similar to ingesting sugars.
- Over time, this can lead to insulin sensitivity and Type II diabetes.
- More importantly, a study published in the journal *Nature* in 2014 has linked artificial sweeteners to a change in the gut microbiome leading to obesity.
- Obesity and insulin resistance are linked to cognitive decline.

MSG and Aspartame

- I believe that these two items can cause the plaques, tangles and inflammation in the brain that causes Alzheimer's disease.
- Its profound affect on tau proteins and amyloid beta may be influential on the development of the disorder.
- They are also inflammatory to people further exacerbating the situation.
- Biggest takeaway is to avoid these as much as possible.

The Gut - Brain Connection

- As my late friend and super nutritionist Robert Crayhon would say, the gut – brain pathway is 80% from the gut to the brain and 20% the other way.
- To have a healthy brain you need a healthy gastrointestinal system.
- The vagus nerve goes from the gut to the brain.
- It is used to help control epilepsy and more recently, depression through a device implanted in the chest.
- This finding suggests that treating the gut may be one of the most important things you can do to improve brain function.

The Gut - Brain Connection

- There is a growing body of scientific evidence to suggest that pathogenic bacteria in the gut is linked to a number of brain disorders like depression, aggression and schizophrenia to name a few.
- Changing the gut microbiome through the use of antibiotics especially when young has been shown to increase the risk of ADHD, memory, dementia later in life and many other cognitive disorders.
- Studies with specific strains of probiotics have been done showing improved behavior and cognitive function in autistic children.

The Gut – Brain Connection

- Feeding the body properly feeds the gut microbiota enhancing brain function.
- Eating the typical Western diet changes the gut microbiota with serious consequences.
- The more artificial the diet, the worse the gut.
- Testing for pathologic organisms is helpful.
- I recommend a product known as Biocidin as a powerful anti-pathogenic agent.
- Limiting sugar and processed foods while increasing fermented foods will also help improve gut microbiota and consequently, the brain.

The Gut – Brain Connection

- In order to optimize this connection, it is important to avoid inflammatory causing foods.
- What are these foods?
- It depends and is different for each person.
- Curcumin a component of turmeric has been touted as being a strong anti-inflammatory agent.
- I have seen some people have the exact opposite reaction to it.
- Since inflammation is at the core of most chronic health conditions, especially cognitive disorders, this has to be dealt with.

The Gut – Brain Connection

- So what's a person to do?
- The LEAP/MRT from Oxford Biomedical blood test is critical in determining the foods that cause inflammation.
- We have seen cognitive improvements in many people over a wide spectrum when following the dietary recommendations based on test results.
- My daughter had a 80% reduction in seizure activity within 5 days.
- We have worked with professional and Olympic athletes who have reported improved concentration, performance and general well being.

The Gut – Brain Connection

- The test looks at the inflammatory reaction to 150 different foods and food additives.
- The foods are grouped and rated according to their reactivity.
- You avoid the ones in the red and yellow carefully following the foods lists they provide for you.
- Retest in six months.
- One caveat, the more toxic you are the more you will react.
- Testing for environmental pollutants is important.

The Gut – Brain Connection

- Environmental toxins greatly affect the way the body reacts to foods.
- Not dealing with this will not resolve the inflammatory reactivity.
- US Biotek has a marvelous urine test for petrochemical solvents.
- In observations we have done over the past four years, people who have addressed their toxicity issues have shown remarkable reductions in the number of foods they react to.

The Gut – Brain Connection

- Glycine, is one of the most important amino acids in helping the body detoxify.
- It is a major component of collagen something found in bone broth (yeah Kaayla).
- Glycine gets metabolized in the body to create serine and Phosphatidylserine which is important in memory as well as concentration.
- If you wish to supplement it, a daily dose of 3-5 grams is recommended.
- I would avoid taking more as it theoretically can shuttle heavy metals around the body.

GMO's

- The research into the effect of GMO's on cognitive function is muddled.
- There is no question that chemicals like the herbicide Roundup™ has detrimental effects on the brain.
- Of this we have solid research, especially for people who work with it in the field.
- Its effects on the general population is less well understood.
- IMHO, we should have studied the effect of GMO's on the brain way before we let the cat out of the bag.

Supplements for the Brain

- While food should be your first line of defense against cognitive decline, supplements can make a huge difference.
- My review will only touch on the vast array of supplements that are beneficial.
- But before we go into specific nutrients, there is one major thing that one can do to boost the brain and delay cognitive decline.
- Exercise.
- Simply going on a walk for 30 minutes a day has been shown to help stay off dementia.
- Weight training is another very helpful exercise regime that may be more beneficial to the brain than running or walking.

Supplements for the Brain

- Glycerophosphocholine aka GPC is a powerful orthomolecule that has been studied extensively in humans.
- GPC has been looked at in over 20 clinical trials on over 4,000 human patients with excellent results and a impeccable safety record.
- GPC is a phospholipid found primarily in the cytoplasm or the cell's water phase.
- Many of the clinical trials on the use of GPC have been randomized and controlled with a number also being double-blind.
- GPC has not only been compared to placebo, it has also gone up against well researched drugs.

Supplements for the Brain

- Here are some of the health benefits seen:
- Improved attention and word recall in healthy young people.
- Helped cognition, mood and behavior in memory declined individuals.
- Improved quality of life in many with severe cognitive decline.
- It was very beneficial in helping stroke recovery in trials that contained nearly 3,000 patients.

Supplements for the Brain

- Additionally, GPC has been shown to benefit:
  - Recovery from traumatic brain injury.
  - Boosts growth hormone (GH) levels.
  - Revitalizes the aging brain.
- The clinically relevant dosage for adults is 1200 mg.
- This is important as lower doses have not been shown to be all that beneficial.
- A two week loading phase of 2400 mg per day seems to be important in those already suffering from cognitive decline.

Supplements for the Brain

- Phosphatidylserine aka PS is another orthomolecule with extensive clinical research into its benefits in brain health.
- Two health claims for PS have even been approved by the FDA.
- "Phosphatidylserine (PS) may reduce the risk of cognitive dysfunction in the elderly…."
- " Phosphatidylserine (PS) may reduce the risk of dementia in the elderly…"

Supplements for the brain

- Other benefits to supplementing PS include:
  - Improving memory, learning in impaired individuals.
  - Improving quality of life in those with severe memory loss.
  - Improving depression as well as easing anxiety in young people and the elderly.
  - Helps individuals cope with emotional and physical stress.
  - Aides children with ADD/ADHD.

Supplements for the Brain

- All cells have PS in their membrane.
- Nerve cells contain the highest concentration of PS.
- A number of human trials have been conducted on Alzheimer's and non-Alzheimer dementia patients with positive results.
- While not a panacea, PS, in conjunction with other treatments holds great promise in many cases of dementia.

Supplements for the Brain

- One of my mentors, the late Robert Crayhon, was known to many as Mr. Carnitine because of his book, the Carnitine Miracle.
- I learned from him how important this vital nutrient is.
- Carnitine, especially in the form known as acetylcarnitine, is essential for creating energy, and as we know, the brain is a major user of energy.
- There are over 21 double-blind trials on AC and the brain showing positive effects.

Supplements for the Brain

- Omega 3 fatty acids, from flax or fish oil, has had numerous positive studies on the effect on brain health especially DHA.
- There are some who would lead you to believe that Omega 3 fatty acids should not be supplemented.
- They argue that these fatty acids will oxidize in the body and can be detrimental to brain and over all health.
- They are right but at the same time terribly wrong.
- Yes, Omega 3 fatty acids can oxidize and yes this is a problem.
- But only if you use them incorrectly.

Supplements for the Brain

- Robert Crayhon taught us that whenever you take Omega 3 fish oils, take 250 mgs of Carnitine for every gram of Fish Oils to avoid this.
- Still, if this oxidation problem was true, then those people with extremely high Omega 3 intake (like the Inuit's), would have very high oxidative markers.
- They don't.
- After reviewing over 4,000 lab tests, Carnitine is an effective way of avoiding the problem entirely.

Supplements for the Brain

- Another highly beneficial way of taking Omega 3's is using Flax Oil (6 grams) in a cold processed whey protein shake.
- This is a more natural way of ingesting Omega 3's as it forms a lipoprotein, nature's way of providing Omega 3's.
- The work of Dr. John Young, MD from Tampa, Florida has suggested that taking this along with a fruit based antioxidant alkalizing minerals can reverse Type II Diabetes a known cause of cognitive decline.
- His success rate is a staggering 80%.

Supplements for the Brain

- The last supplement I will mention is curcumin.
- A derivative of the spice turmeric, it is a powerful anti-inflammatory compound.
- Studies done at UCLA Medical Center on a specific type of curcumin being able to raise Down's Syndrome children's IQ's by an astonishing 10%.
- It is being tested for the treatment of Alzheimer's disease as well as a wide array of different cancers.
- It's commercial name is Longvida™

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