More Interesting Interventions to Support Brain Health

Dr. Kate Thomsen and Silky

My last article, Brain Health: You CAN Lower Your Risk of Dementia (MCW Nov/Dec 2021) was an overview of the known risk factors for dementia. Listed below are more ideas for supporting better brain health.

Nutrition

Water: The brain is 73% water. It only takes 2% dehydration to affect attention, memory and other cognitive skills. Drinking just a few ounces can reverse that. Your daily water intake goal (in ounces) is ½ your weight in pounds. Fill a pitcher with this amount of pure water, place it on the counter, and drink from it throughout the day. If you are not finishing it by the early evening, you need to employ a new drinking water schedule.

Canola oil: Canola oil, from rapeseed, is one of the most commonly consumed oils in the United States. Low in saturated fats and high in polyunsaturated fats, it has been thought of as a healthy oil until researchers from Temple University published a study in 2017 in Scientific Reports (Nature). In this 6-month mouse study, one group of mice was fed a normal diet and the other group ate a diet rich in canola oil (the human equivalent of two teaspoons/day). The canola fed mice had memory impairment on the maze test and their brains showed increased plaque formation with considerable neuronal damage and decreased neural connections. The canola industry disputed the inference citing that mice are not humans.

Essential Fats: The human brain weighs a little over 3 pounds and 60% of it is fat. The brain is the fattest organ in the body. Omega 3 and Omega 6 fats are "essential" for humans – meaning they must be obtained from the diet. Data have shown that Americans are quite deficient in two crucial Omega 3 fats: EPA (anti-inflammatory) and DHA (its structure facilitates neuronal communication). These fats and some saturated fats make up over 84% of the total brain fatty acids. They are mandatory for proper brain function and development.

A systematic review of the data on Omega 3 fats was published in 2018 in the journal, Nutrients. The author cites evidence that over 1 gram per day of EPA and DHA significantly improved episodic memory in older adults with a history of mild memory complaints. Other studies showed that individuals with dementia had lower blood levels of Omega 3 fatty acids than those without dementia. EPA levels were also lower in individuals with "predementia" compared with healthy elderly controls. Foods with high EPA and DHA are fish and seafood, followed by pasture raised beef and eggs. To obtain a high intake of Omega 3s without the toxins in the fatty fish, I prefer a high EPA/DHA fish oil in triglyceride form.

Coffee/tea: A recent prospective cohort study of over 365,000 participants (ages 50 – 74) followed for 10 years was done by the National Natural Science Foundation of China. Results showed that drinking 2-3 cups of coffee AND 2-3 cups of tea daily lowered stroke risk by 32% and dementia risk by 28%. They hypothesize these results were due to the rich antioxidants and beneficial effects on blood vessel walls from these beverages. (FYI: "cups" in China are not "mugs")

Obesity

A study of women with high visceral fat (belly fat) showed a 39% higher risk of developing dementia. As the belly size gets larger, the hippocampus (the memory center in the brain) gets smaller.

Inflammatory proteins, called cytokines, released from fat can contribute to cognitive deterioration. Studies have shown that obesity doubles a person's risk of having elevated amyloid proteins in their brains later in life. Amyloid protein is seen in higher amounts in the brains of people with Alzheimer's.

Inflammation

Inflammation occurs when the body's immune system sends out cells to fight invading organisms or heal an injury. Many of our chronic diseases: cardiovascular disease, autoimmunity, tick-borne infections, toxins, etc produce inflammation. Inflammation in the body activates the microglia (immune cells in the brain) that mistakenly attack healthy brain cells.

Infection: We used to assume our brains were protected from pathologies in the body by the blood vessels and tissues that form the selective blood brain barrier (BBB). But the BBB becomes leaky under certain conditions (especially age). A virus, bacterium, or fungus sneaks through this leaky BBB and triggers the brain's self-defense system. As the immune system (microglia) fights the intruders, a trail of debris is created including beta-amyloid, an antimicrobial protein, acting as a sticky web to trap the organisms. The beta-amyloid plaques seen in the brains of individuals with AD is the brain's natural response to an infectious agent, accumulating as a way of defending us against a pathogen. Rather than the cause of AD, beta-amyloid is a reaction to a pathogen. The actual cause of the brain inflammation is the intruder, eg, tick-borne infections, fungi like yeast, viruses, etc…

HSV1: There is accumulating evidence that the oral herpes simplex virus 1 (HSV1) may be one of the major causes of amyloid plaque and AD. Research has shown that it infects up to 90% of adult brains and we know it can remain latent in the nervous system lifelong, periodically reactivating and causing brain inflammation. In 2009, Professor Ruth Itzhaki published a paper revealing that she had localized HSV1 DNA within beta-amyloid plaques in Alzheimer diseased brains. An AD preventive strategy may be to include antiviral agents to treat or prevent viral outbreaks.

Gingivitis: A less appreciated source of inflammation is stealth infection in the oral cavity which can seed widespread damage in the body including the brain. Additionally, Porphyromonas gingivalis bacteria in gingivitis produces a protein that destroys neurons and can lead to memory loss.

Hormones

Estrogen: 2 out of every 3 individuals with AD is a woman. Research has shown that hormonal transitions affect brain pathology, brain metabolism and the person's risk for AD. The Women's Health Initiative Memory Study (WHIMMRI) published in Neurology in 2009 was one of several studies showing an association between estrogen and risk of cognitive impairment and dementia later in life. The age of those participants (65 and older) might have skewed the results. Alternatively the participants in the Kronos Early Estrogen Prevention Study (KEEPS) were 42 – 59 years old and recently menopausal. They used an estrogen patch, pill, or placebo for 4 years. Brain scans performed at 7 years from trial onset showed the women using the patch had higher prefrontal brain volume and lower amounts of beta-amyloid deposition. No differences in cognitive testing was shown among the 3 groups (definitely worth more research…).

Insulin (from sugar and refined carbs): Insulin degrading enzyme (IDE) breaks down both insulin and beta-amyloid. When high amounts of insulin need to be broken down, there is not enough IDE enzyme to break down the beta-amyloid which builds up. This makes hyperinsulinemia is a high- risk factor for AD. Research has shown: Subjects separated into groups by dietary percent carbohydrates found that people who ate the most carbs had an 80% higher risk of early AD; People with type 2 diabetes are twice as likely to get Alzheimer's; People with diabetes treated with insulin are also more likely to get AD if their insulin is not well controlled. Intermittent Fasting with lower carb intake can gradually increase insulin sensitivity and utilization, sparing IDE so it can break down beta-amyloid.

Re-purposed Drugs

Viagra (sildenafil): A 2021 Study in Nature Aging used a database of more than 7 million people in the U.S. comparing sildenafil users to nonusers. They found that those who used the drug were 69% less likely to have AD, even after 6 years of follow-up. Cell cultures showed sildenafil increases brain cell growth and decreases formation of tau proteins (found in the neurofibrillary tangles in Alzheimer brains).

PPAR gamma agonists (glitazones: pioglitazone and rosiglitazone; also nonsteroidal anti-inflammatory drugs and telmisartan): Glitazone drugs are used to regulate blood sugar and cholesterol metabolism and suppress inflammation. When used in animal research, they improved learning and memory. Human studies with AD patients also showed significant improvement in memory and cognition.

Calcium Channel Blocking drugs: Brain cells high in intracellular calcium become diseased with disrupted memory function. The memory effects of blocking entry of calcium into fruit fly neurons has been investigated. The calcium blocked fruit flies showed better memory by being able to determine more often which of 2 odors is associated with an electric shock. (I know, fruit flies are not human.)

Naltrexone: Anterograde amnesia (the inability to form new memories) is a new phenomenon being recognized in fentanyl overdose patients. Fentanyl is an opioid narcotic and more victims are surviving due to the widely available fentanyl overdose-antidote drug, naltrexone. The brains of patients with this amnestic syndrome have injured hippocampi on brain imaging - similar to what is seen in Alzheimer patients. Hippocampi are the brain structures responsible for turning short term memories into lasting ones. Researchers have been studying naltrexone, the opioid antagonist, to see if it can have a protective or reversal effect on the hippocampus in patients with early signs of AD. Low dose naltrexone (one-tenth the usual dose) is used off-label for its anti-inflammatory and immune modulating effects. A 2015 rat study showed that chronic naltrexone treatment prevented deficits in memory induced by acute poisoning. (Once again, rats are not human)

Novel Therapeutics

Oligomannate: This extract of marine brown algae modulates the gut-brain connection. It reduces harmful by-products of intestinal bacteria which lessens inflammation. A mouse model has shown that it decreases beta-amyloid deposition and improves cognitive function. It is being developed by a pharmaceutical company in China and has conditional approval there. A phase 4 clinical trial in the US started in June 2021 and expects to be completed in 2024.

Light therapy: A helmet designed to deliver near-infrared light to the brain has been studied in animals and people. Effects seen include increasing blood circulation, boosting brain energy, protecting neurons from damage and maintaining neuron connections. The result of these actions appears to improve memory, motor function, and processing skills in cognitively healthy older adults. This near-infrared transcranial photobiomodulation therapy (PBM-T) has also been shown to reduce amyloid and activated tau, suggesting potential benefit in patients with dementia.

Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is trained in Family Medicine, and Board Certified in Integrative Medicine. She is an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for 23 years. For more information see www.drkatethomsen.com or call the office at 609-818-9700.