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Literature Review

Preventing and Possibly Reversing Dementia and Alzheimer's Using Thermotherapy and Vibroacoustic Therapy in 12 Subjects Over 3 Months

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Abstract

The Objective of this study is to find the possibility of the use of both Thermotherapy [Hyperthermia][Heat Therapy] and Vibroacoustic therapy [Vibration + Sound] to prevent and possibly reverse chronic neurological conditions like Dementia and Alzheimer's Disease in 12 subjects over 3 months using Pre/Post Biofeedback Testing, Oximeter, Wellness IQ Questionnaire [www.academyofwellness.com] and CBC blood test results including HBA1C. Overall Results were positive suggesting possible prevention and reversal of Dementia and Alzheimer's using Thermotherapy and Vibroacoustic Therapy.

Keywords: Alzheimer's; Thermotherapy; Vibroacoustic Therapy

Results

	Biofeedback results		Oximeter		Wellness I		HBA1C	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Subject 1	71	83	96	98	45	68	8.3	6.7
Subject 2	65	91	95	99	51	81	9.2	6.6
Subject 3	55	85	95	98	62	78	9.4	**6.9**
Subject 4	74	88	96	99	55	82	8.8	6.8
Subject 5	71	90	97	98	45	78	7.7	7.1
Subject 6	66	87	95	99	50	85	9.5	**6.9**
Subject 7	55	88	96	98	66	90	7.7	6.4
Subject 8	67	90	95	97	60	81	7.1	6.6
Subject 9	69	88	96	98	52	86	8.8	7.1
Subject 10	49	78	95	97	60	75	7.8	6.4
Subject 11	55	81	96	99	45	81	7.7	6.2
Subject 12	64	88	97	98	60	78	7.9	6.6

Table 1

Discussion

12 Subjects were randomly selected at Dr. George Grant Clinic in Richmond Hill, ON. Canada and Dr. Jay Vanden Heuvel Clinic at Green Bay, Wisconsin, USA. Subjects were asked to use the Thermotherapy and the Vibroacoustic Mats 2 hours daily and some subjects used also overnight during their sleep.

Subjects were tested using Quantum Resonance Biofeedback Device which test 39 main body organs using frequency measurements that correlates with CBS blood test by 95% based on previous published research.

The overall score range from 0 to 100% The higher the score, the better overall health. Subjects under 50% overall score may indicate health challenges including excess use of prescription and over the counter medications while subjects with overall score of over 80% indicated better health score. Our Olympic Athletes in Canada and USA must score above 95% in order for them to compete and have no complications during competitions. The Biofeedback test include Heart, Brain, Liver, Gall bladder, Kidney, Immune System, Male and Female organs/Hormones as well as 39 key organs.

The Oximeter test measure Oxygen [SPO_2] which indicates blood flow and oxygen saturation. Levels below 95% indicates low blood flow, poor circulation and levels above 98% indicates excellent blood flow.

Wellness IQ at www.academyofwellness.com measure lifestyle factors, Oxygenation, Hydration and other daily habits using 10 questions each worth 10 points Total 100. Score below 50% indicates poor Breathing/Blood Flow/ Poor Hydration/Poor Eating Habits. Score above 80% indicates excellent lifestyle habits.

CBC Blood test includes HBA1C measure the average blood sugar level over 3 months period. Levels above 10 indicates Diabetes and levels below 7 indicates healthy blood sugar levels.

It is shown in the results that after using the Thermotherapy and Vibroacoustic Therapy there is a statistical significant improvement at 0.05 confidence level suggesting that these natural treatment increases blood flow [Oxygenation]; decrease inflammation, reduces stress and improves deep sleep functions as demonstrated in previous published studies to prevent and possibly reverse the symptoms of Dementia and Alzheimer's.

Literature Review

Thermotherapy and Vibroacoustic therapy increases blood flow to the brain as well as BDNF [Brain Derived Neurotrophic Factor] which increases neurons and neurotransmitters such as Dopamine and GABA that potentially prevent Dementia and Alzheimer's [11].

The increased blood flow to the brain similar to regular exercise using Thermotherapy and Vibroacoustic Therapy help prevent Dementia and Alzheimer's [11].

The BioAcoustic Mat™ is useful for

- Stress reduction
- Entraining
- Physical and auditory stimulation
- Music therapy.

We Recommend the use the BioAcoustic Mat™ in conjunction with the Biomat® for optimal performance to provide Vibration Therapy, Sound Therapy and Thermotherapy to help increased blood flow to the brain, increase BDNF and possibly prevent and reverse Dementia [10].

The brain is akin to the universe with as many connections as there are stars in the universe. Inside the cranium houses a mass of neurons made up of astrocytes-star shaped bodies. Tens of billions of them. Coming to life with energy and consciousness. It determines reason, interprets emotions like love, to appreciate and help create art and music. To express empathy. To store and pull up our most important human connections by memory. These are just a few of the marvelous and mysterious functions. And no one wants to lose any of those functions. But 50 million worldwide do.

First noted in 1906 by German physician Alois Alzheimer. It is now seen as a disease of genetics (i.e. APOE4 gene). No one wants to earn Alzheimer's' Disease (AD). Yes earn it.

There is a lot more to be discovered but better known are precise places in the brain it strikes. Rampaging proteins that give it power to take over with cascades of breakdowns. Modern medicine is trying to control it. The long-term goal should be prevention. A cure is a long way off. The purpose of this study is to show vibrational therapy, thermotherapy, and acoustic therapy make powerful preventative measures in helping dementia and Alzheimer's with a non-invasive technique.

We do know that people with these issues build up abnormal proteins called beta amyloid. They can form plaques outside of nerve cells. Even inside the brain cells called tau. Generally known as tangles.

Is this all related to genes or are their more epi-genetic influences at work? Epi-genetic is an influence that triggers a genome to express itself. A predisposing factor can trigger a genome to manifest into a por outcome. Such as abnormal blood sugars. Which can deter the life of the cell and create a condition form lifestyle. There is plenty of evidence now that abnormal blood sugars may be isolated to only cells in the brain. Now regarded as diabetes type III. Like cells in a person with diabetes type II, the brain cells slow or even stop responding to natural insulin levels from the body. People with dementia and Alzheimer's brain cells lose their ability to break down sugars using insulin. Which is where energy for the brain cells comes from in the first place. Without proper energy conversion the cells are compromised. Poor sleep also compromises the detoxification aspect of removal of waste in brain while sleeping and all this complicates matters.

Dementia itself comes in many forms. The most common of course, is Alzheimer's itself. The second is vascular dementia. Which is decreased blood flow.

Again, poor sleep is a powerful generator of these issues and is being heavily studied as well. It also stands to reason healthy eating, stress reduction, proper gut health, and circulation are prime areas of prevention and stabilization.

According to Majid Fotuhi, Harvard neurologist who specializes in prevention, new lifestyle techniques such as exercise, targeted training, diet, quality sleep, and stress reduction all show reduced levels of tau. He states "improve the health of the heart, and you improve the health of the brain".

Sound prevention when you consider the Brain requires a lot of oxygen. The brain itself uses 20% of the blood pumped by the heart. Neurons deprived of proper oxygen levels, do not work as well and maybe become tangled in time.

A randomized controlled trial from the 2016 Alzheimer's Association conference showed even sedentary elderly people improve with exercise. Thermotherapy has been shown to improve blood flow. Imagine helping prevent cognitive decline by sleeping or resting on bioacoustics and thermotherapy mats.

Studies show it can be prevented. That is the only rational approach to AD because the expensive drugs do not work.

How can it be prevented? The answer is by addressing the same factors that lead to heart problems, that is, by optimizing how your neurons metabolize. It is all about how we fuel, increase blood flow, and build our cells through nutrition, how they detoxify, how we avoid outside toxins, and how we use said neurons.

It is very distressing to see these simple facts ignored while we are bombarded by TV commercials about ineffective drugs.

Even as early as 2002, the risk showed it can be reduced by treating high blood pressure, blood sugar balance, weight reduction, and lipid reductions. It went largely ignored in favor of pharmaceutical approaches [1-19].

The AP (6/22, Neergaard) reports that even though "there are no proven ways to stave off mental decline or dementia, but a new report says there are hints that exercise, controlling blood pressure and some forms of brain training might offer help". The National Academies of Sciences, Engineering and Medicine said in a report released that came in response to a National Institute on Aging (NIA) request.

USA Today (6/22, Toy) reports, "The report's findings line up with the Alzheimer's Association's findings from two years ago" said Keith N. Fargo, the association's director of Scientific Programs and Outreach. At that time, "the organization published its own review and identified two things that could help minimize the risk of cognitive decline". Those two things were "'increasing physical activity and improving cardiovascular health".

USA Today (7/27/16) reports several new studies presented at the Alzheimer's Association International Conference in Toronto confirmed that "living a healthy, non-smoking, socially active and interesting life remains the best way to prevent dementia". Moreover, research shows there are currently no "medications that can prevent the fatal disease or extend the lives of the more than 5 million Americans currently suffering from Alzheimer's". However, the piece notes that one class of drugs, cholinesterase inhibitors such as the drug Aricept, can delay or reduce symptoms in some people.

Since about 2018. Alzheimer's disease has been from time to time referred to as "type III" diabetes. Though that may not make much sense, there is a problem with insulin usage. Brown univer-

sity was first to denote this. Type 1 diabetes is an autoimmune disease. Type II diabetes is a chronic disease caused by diet. Instead of another type of diabetes, although maybe appropriate, it is increasingly looking like Alzheimer's is another form of diabetes but mostly a side effect of a sugary, Western-style diet.

In some cases, the pathway from abnormal blood sugar to Alzheimer's leads through type 2 diabetes, but as a study and others show, that is not always the exact circumstances.

A longitudinal study, published in the journal *Diabetologia*, followed 5,189 people over 10 years and found that people with high blood sugar had a faster rate of cognitive decline than those with normal blood sugar-whether or not their blood-sugar level technically made them diabetic. This shows, the higher the blood sugar, the faster the cognitive decline. Went on to say, "Dementia is one of the most prevalent psychiatric conditions strongly associated with poor quality of later life", said the lead author, Wuxiang Xie at Imperial College London, via email. "Currently, dementia is not curable, which makes it very important to study risk factors".

Melissa Schilling, a professor at New York University, performed her own review of studies connecting diabetes to Alzheimer's in 2016. She sought to reconcile two confusing trends. People who have type 2 diabetes are about twice as likely to get Alzheimer's, and people who have diabetes and are treated with insulin are also more likely to get Alzheimer's, suggesting elevated insulin plays a role in Alzheimer's. In fact, many studies have found that elevated insulin, or "hyperinsulinemia", significantly increases your risk of Alzheimer's. So, ponder this. People with type 1 diabetes, who do not make insulin at all, are also thought to have a higher risk of Alzheimer's. How can both these be true?

Also, verbatim in this study, Schilling posits this happens because of the insulin-degrading enzyme. A product of insulin that breaks down both insulin and amyloid proteins in the brain—the same proteins that clump up and lead to Alzheimer's disease. People who do not have enough insulin, like those whose bodies' ability to produce insulin has been tapped out by diabetes, are not going to make enough of this enzyme to break up those brain tangles. Meanwhile, in people who use insulin to treat their diabetes and end up with a surplus of insulin, most of this enzyme gets used up breaking that insulin down, leaving not enough enzyme to address those amyloid brain clumps (tangles).

According to Schilling, this can happen even in people who do not have diabetes yet—who are in a state known as "prediabetes". It simply means your blood sugar is higher than normal, and it is something that affects roughly 86 million Americans.

Schilling is not primarily a medical researcher. But Rosebud Roberts, a professor of epidemiology and neurology at the Mayo Clinic, agrees.

In 2012, Roberts did a stud that broke nearly 1,000 people down into four groups. Based on how much of their diet came from carbohydrates. The group that consumed the most carbs had an 80 percent higher chance of developing mild cognitive impairment (on the way to dementia). The other group consumed a lot less. The stud went on to say, "people with mild cognitive impairment (MCI), can dress and feed themselves, but they have trouble with more complex tasks. Intervening in MCI can help prevent dementia".

Rebecca Gottesman, (Professor of Neurology/Johns Hopkins), cautions that the findings on carbs are not as well-established as those on diabetes. "It's hard to be sure at this stage, what an idea' diet would look like", she said. "There's a suggestion that a Mediterranean diet, for example, may be good for brain health".

But she says, "there are several theories out there to explain the connection between high blood sugar and dementia". Diabetes complications can weaken the blood vessels, potentially causing "mini-strokes". Directly causing various forms of dementia (vascular dementia). Overconsumptions of simple carbohydrates (sugars) can make cells, like in the brain, insulin resistant. In turn, could cause the brain cells to die. As already known, to be a leading cause of obesity. Also noted in this study, "extra fat in obese people releases cytokines, or inflammatory proteins that can also contribute to cognitive deterioration", Roberts said. In one study by Gottesman, obesity doubled a person's risk of having elevated amyloid proteins in their brains later in life.

Roberts said that "people with type 1 diabetes are mainly only at risk if their insulin is so poorly controlled that they have hypoglycemic episodes. But even people who do not have any kind of diabetes should watch their sugar intake", she said.

"Just because you don't have type 2 diabetes doesn't mean you can eat whatever carbs you want", she said. "Especially if you're not active". What we eat, she added, is "a big factor in maintaining con-

trol of our destiny". Roberts stated this new study by Xie is interesting because "it also shows an association between prediabetes and cognitive decline".

As mentioned in this study, it is an important point that often gets forgotten when discussing Alzheimer's. Which went on to say, "It is such a horrible disease that it can be tempting to dismiss it as inevitable. And, of course, there are genetic and other, non-nutritional factors that contribute to its progression". As researchers point out, daily decisions about food are one risk factor we can control. Obviously, decisions we make while we are in our youth can affect our future cognitive health.

"Alzheimer's is like a slow-burning fire that you don't see when it starts", Schilling said. Time is the deciding factor in order, for clumps (tangles) to form. And cognition does decline/accelerate with those poor daily decisions. Schilling also stated, "By the time you see the signs, it's way too late to put out the fire".

Yes, abnormal blood sugars are now being a big component of brain health but what about other factors like gut health?

We now know that the microbiome of ourselves is a big part of brain health, cardiovascular, blood sugar control, hormones, and much more. The microbiome is a newly discovered organ. Brought to front stage by the human microbiome project in 2010. It has a huge effect on how we think, feel, and function. Trillions of bacteria, fungi, and viruses (yes we have a virome too). It has been found that helping our gut health (microbiome) recues inflammation. Improves our immune system and just discovered that certain bacteria in our gut only lives on GABA chemicals. Proof that bacteria affect our brains.

Even one species like *L. rhamnosus* dramatically alters GABA activity in mice. Again proof.

There are over 50 bacterial groups detected in the human gut microbiome to date. Two major groups are Bacteroidetes (plant lovers) and firmicutes (sugar lovers). It is obvious which one higher population of species would benefit the brain, the Bacteroidetes.

"The largest and most complex of our microbiomes is that of the gut, and disruptions in its delicate balance have been linked to virtually every disease that a person can suffer, from autism to cancer to dementia to cardiovascular and autoimmune diseases". According to Dr. Felice Gersh, M.D.

According to Univ. Cal. San Diego in 2010, bacteria employ electrical signaling in the same way brain cells do (new science). Bacteria may be ancient organisms but are far from primitive. Their clinical studies showed that they behave collectively! That bacteria share nutrients with neighbors, move as a colony, even committing suicide for the greater good of the colony. Having a direct effect on the immune system, metabolism, majority of chemicals and modifying the epigenome.

Speaking of metabolism, SCFA (short-chain fatty acids) are the metabolic post-products of the fermentation of fiber that are produced by the gut microbes. Making Acetic Acid, Butyric Acid which is absorbed by the host. Also, Vitamin B's, K, metabolizing bile acids, sterols, and xenobiotics. Suggesting the microbiome is like an endocrine organ.

This is important for numerous aspects of health, including the maintenance of optimal metabolic well-being, mood, and cognition, and the health of the immune system.

Our microbe germs are the immune system generators and more importantly linked to the brain.

For example, according other advanced microbial studies, bacterial peptides stimulate macrophages (Interleukin/Tumor Necrosis Factor). LPS (lipopolysaccharides) form from cell walls of gram-negative bacteria (most good probiotics are gram +). Increased LPS promotes pro-inflammatory (cytokines) concentrations. When this occurs our natural cortisol levels increase (stress induced). Resulting in but not limited to anxiety, depression, impaired long-term memory, and leaky gut.

This suggests a healthy gut is critical to our brain health.

At the Gut-Brain Relationship conference (2014), evidence was exposed that microbiome has a great influence on the brain itself. This can affect behavior good or bad. Shown to affect the Hypothalamic-Pituitary-Axis (HPA). The biggest effect? Improving sleep and decreasing stress/cortisol production (obesity).

The brain and the gut both develop from the same tissue in utero. They split into the enteric nervous system (ENS) and the central nervous system (CNS). Connected via cranial nerve 10 or the vagus nerve. A direct bi-directional communication system between the ENS and the CNS. We truly do have a "gut feeling". It's referred to as a second brain.

Studies show gut microbiomes do have a significant influence on psychosis, mood, and behavior. Via communication along the gut-brain axis and the HPA axis. Research indicates exposure to stressful events "influences" the composition of the microbiome. Creating both short- and long-term effects.

This brain-gut axis (HPA) enables bottom-up signaling from the gut to the brain, and top-down signaling, whereby the brain influences secretory and motor function of the gastrointestinal tract (Vagus nerve X).

According to Dr Ralf Jager PhD, a scientific advisor with Pharmachem labs, "If balance of gut microbiota tips out of whack and into a state of dysbiosis-whether via gastrointestinal irritation or other causes-the ENS then appears to send signals to the CNS that can actually trigger changes in mood". Also notes "Certain probiotics have been shown to balance the gut microbiota and, consequently, improve brain health". Probiotics appear "to aid the response to a stressor by reducing levels of the stress hormone cortisol". They help keep us calm!

Not only is heart health = brain health, so is a good microbiome or second brain.

One other aspect to consider is BDNF (Brain-Derived Neurotrophic Factor). It is considered an important protein that influences brain function as well as the peripheral nervous system. BDNF influences a variety of functions. Helping prevent death of existing brain cells, inducing the growth of new neurons (neurogenesis) and synapses, and supporting cognitive function. Low levels of BDNF are often problematic and have been linked to Alzheimer's.

BDNF plays a role in neuroplasticity (allows cells in brain to compensate for injury). Increasing circulation (exercise or thermotherapy), reducing sugar intake, utilizing the sun and vitamin D, and increasing polyphenols are just some ways to bolster prevention.

Increasing endorphins (feel good chemicals) by increasing circulation also makes great brain sense.

Conclusion

Everything discussed can be improved with thermotherapy, infrared sauna, negative ions, and music.

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