P2-202 THE HUMAN BODY IS AN ORGANISM CAPABLE OF USING H_2O AS AN ELECTRON SOURCE, LIKE VEGETABLES ARE: AN UNEXPECTED FINDING WITH IMPORTANT THERAPEUTIC IMPLICATIONS IN AD

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Background: Whereas respiration in the mitochondrion reduces oxygen to water, photosynthesis in the chloroplast oxidizes water to oxygen. The former process releases energy, so the latter process requires energy. Both processes occur within melanin. Light absorption is the first step in any photochemical process. When a photon is absorbed, an electron becomes sufficiently energized to be pushed from an inner to an outer orbital. The molecule is shifted from the ground state to an excited state. Since the number of orbital in which an electron may exist is limited and each orbital has a specific energy level, any given atom or molecule can absorb only specific wavelength light. This is always true, except in melanin. **Methods:** From 1990, we began to study the three main causes of blindness, using digital methods of retinal imaging. For 12 years, 4800 patients were examined and registered, and analized with mathematical models. **Results:** We found, after twelve years of studying the three main causes of blindness, that melanin is to human eye (and body), what chlorophyll is to vegetables. Both dissociate (oxidize) the water molecule. But chlorophyll, outside of leaf, is permanently inactivated in 20 seconds, and melanin preserves this dissociative function, because the oxygen-mediated destruction is halted by a second great property of melanin: it supports the opposite reaction; the reduction of oxygen into water. The highest oxygen level in human eye is 97 %, and the lowest level is 94 %; same as inside melanin. This concentration is the righteous in order to protect the extremely oxygen-sensitive photoreceptors. **Conclusions:** When human photosynthesis is enhanced pharmacologically, the redox capability of eukaryotic cell increases four times or more. This is the explanation for the clinical improvement in AD patients (and other age related diseases) when treated with pirrolic analogues.

P2-203 A RANDOMISED STUDY TO COMPARE THE EFFICACY, TOLERABILITY AND SAFETY BETWEEN MEMANTINE AND DONEPEZIL IN MODERATE TO SEVERE ALZHEIMER'S DISEASE

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Background: The brain is a monstrous, beautiful mess. Its billions of neurons lie in a tangled web that displays cognitive powers far exceeding any of the silicon machines we have built to mimic it. AD is a neurodegenerative disease. Care for people with dementia is becoming more difficult. The most obvious caregivers are experiencing difficulties in providing proper care. Thus with these factors in streamline the objective of the study was to compare the efficacy, tolerability and safety between Memantine and Donepezil in moderate to severe AD on the Functional Dementia Scale (FDS) and CareGiverBurdenScale (CGBS). **Methods:** It is an open randomized comparative study between Memantine (NMDA receptor antagonist) 20mg/day and Donepezil (cholinesterase inhibitor) 5-10mg/day in AD in 22 patients in two equal groups over duration of 40 weeks. The primary efficacy measure was the mean total change in FDS and CGBS using last observation carried forward. Onset of efficacy was defined as >20% reduction in the mean total score of FDS and CGBS from baseline at 2weeks. Response rate was defined as >50 % reduction in the mean total score of FDS and CGBS from baseline to the study end. Tolerability and safety were evaluated by assessing discontinuation rates, adverse event occurrence, vital signs, and laboratory tests. **Results:** Onset of efficacy on FDS and CGBS was 16.7 % (mean time 61.25days) and 80% (mean time 36days) with Memantine and Donepezil respectively. Response rate was 89.3% and 40% with Memantine and Donepezil respectively. Total Reduction in score of FDS from baseline to the study end was 39.50 and 25.60 with Memantine and Donepezil respectively. Total Reduction in score of CGBS from baseline to study end was 40.00 and 27.20 with Memantine and Donepezil respectively. Tolerability was 86.33% and 20% with Memantine and Donepezil respectively. Anorexia, musclecramps,-constipation,headache,and insomnia, were the common side effects and self limiting. Safety was 100% in both the groups. **Conclusions:** Donepezil scored better than Memantine in the onset of efficacy at 2 weeks, however Memantine scored better than Donepezil at the end of study (40 weeks) regarding response and improvement in CGBS, FDS and tolerability. Thus, in similar clinical settings Memantine can be prefered.

P2-204 PRESERVATION OF COGNITIVE FUNCTIONING IN DEPRESSED, DEMENTED GERIATRIC PATIENTS WITH CARDIOVASCULAR RISK FACTORS: AN ONGOING 3-YEAR NATURALISTIC STUDY

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Background: It is well known that the majority of geriatric patients with depression and mixed dementia have cardiovascular co-morbidities, which have an additional negative impact on cognition. There are no studies hitherto which have investigated the long-term effect of combined treatment (medications and non-pharmacological interventions) in this group of patients. This investigation is a part of an ongoing naturalistic study to explore the possibility of preventing cognitive decline in demented, depressed seniors by implementing a multifaceted treatment model. Here we present the data related to efficacy of 36 months of treatment of demented, depressed geriatric patients with cardiovascular co-morbidities. **Methods:** The study group consists of 38 patients (17 male, 21 female) with an average age of 72.34, who are diagnosed with mild dementia and depression and have a history of hypertension, CAD and dyslipidemia. Additionally, 18 (47.38%) have diabetes mellitus and 8 (21%) have prior strokes and head trauma. These patients were evaluated at baseline and in one, two, and three years of treatment. The medications included antidepressants (sertraline, citalopram, or venlafaxine XR, alone or in combination with bupropion XR) and cholinesterase inhibitors (donepezil, rivastigmine or galantamine alone or in combination with memantine) along with their regular medications. Non-pharmacological interventions included vitamins and supplements (multivitamins, vitamin E, Deplin, Alpha-Lipoic Acid, Acetyl-L-Carnitine, Omega-3 and Coenzyme Q-10), diet changes, and our recently developed brain activation program (a home-based protocol involving mild physical exercises and cognitive training). The assessment battery consists of 6 tests that evaluate attention, memory, and executive functions. **Results:** The maximum significant cognitive improvement is seen at the end of 24 months of the treatment in MMSE, attention, memory, naming, construction, clock drawing, verbal fluency, and Ruff Frontal Fluency tests. At the end of 36 months of the treatment significant improvement is observed on attention, construction, and clock drawing. The rest of the tests show no signs of mental decline below base line for the entire period of the treatment. **Conclusions:** Our integrative treatment model in depressed, demented, elderly patients with cardiovascular co-morbidities was effective in delaying cognitive decline for 36 months.

P2-205 THE EFFECT OF DONEPEZIL ON THE REACTIONS OF THE INNATE IMMUNE SYSTEM IN THE PERIPHERAL BLOOD LEUKOCYTES OF HEALTHY YOUNG BLOOD DONORS

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Background: The effect of donepezil on two mechanisms of innate immunity:leukocyte resistance to viral infections and cytokine productions was studied. **Methods:** The degree of natural resistance of human peripheral blood leukocytes(PBLs) was determined by studying the kinetics of vesicular stomatitis virus(VSV) replication.A titer of 0-1 log TCID 50 indicated complete resistance, 2-3 log partial resistance, and> 4 lack of resistance.Cytokine levels were determined with use of ELISA test. NFkB activation was assayed