Alzheimer's Disease Coming to an End

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Introduction:

Many adults fear the aging process. This fear has to do with some of the side effects that happens with aging like Alzheimer's Disease (AD). "Alzheimer's disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills, eventually, the ability to carry out the simplest tasks" (N. (Ed.). (2016)). This is why many are afraid to age, it's not mainly concerned with the dying aspect but more directed towards the fact of the many disabilities that are attributed with aging. But hopefully in the near future that may not be an issue for much longer. Scientist and doctors are teaming together and using a modality called Position Emission Tomography (PET). Using this modality, it brightens a protein fragment called amyloid plaque which has been prominent in most Alzheimer patients. The amyloid plaques usually begin in the temporal lobe, and then the parietal lobe and then it ventures onto the lateral frontal cortex. Noticing these small changes could play a very crucial role to detecting Alzheimer's Disease early on!

Imaging Modalities Diagnosis:

According to Callahan J (2011) "The imaging modality of PET uses positron emitting isotopes attached to specific tracers to image metabolic pathways or other biological processes. As PET scanning often interrogates specific biochemical processes involved in substrate utilization." PET scans help light up the brain in a different way than an MRI would, and demonstrate the brain in a different aspect. When looking at an MRI, some pathologies are much harder to differentiate between good and bad, especially with Alzheimer's disease. A PET scan can determine a diagnosis between Alzheimer's disease and Frontotemporal degeneration by simply showing different heat spots. Alzheimer's disease is still new to researchers! There are many different symptoms, signs, and patterns that patients with AD have that patients without AD have. There is constantly new information on this diagnosis. One belief was that B amyloids were considered to detect AD. But stated, "About 30% of older people have ß amyloids and don't have Alzheimer's and won't get Alzheimer's" (Mitka, M., 2013). To most, this percent is low enough, that it would be more beneficial to diagnose these patients with AD and start treating as soon as possible. This sounds crazy and outrages, but it could help loved ones keep what little sense of mind they may have left, and cherish it. What is beginning to be a new break through is the study using PET scans with an florbetapir F18 tracer. This is according to Mann, D. (2011, July 11) has proven that this study was able to determine 68 people that were suspected for Alzheimer's Disease, 60 citizens who showed symptoms of mild impairment, and 82 healthy 65 year and older patients that showed no signs of cognitive impairment. MRI is being pared with PET scanning to help further diagnosis Alzheimer's disease more accurate. There have been other studies that focus on the correlation between the gray matter and white matter of the brain, the focus was more directed towards the correlation between glucose metabolism and amyloid deposition. "Amyloid accumulation in the whole white matter was 13.7% higher in AD patients than in healthy subjects, and the uptake pattern was similar to that of glucose metabolism" (Young Jin Jeong, Hyun Jin Yoon, Do-Young Kang, Jeong, Y. J., Yoon., …, 2017). Sometime soon there will be a discovery made that will help prevent the aging community from Alzheimer's Disease.

Work Behind the Scene:

The study of Alzheimer's Disease has a long way to reach a final cure. There is some treatments that are being tested this very minute. According to Winslow BT (2011), "Potential treatments include resveratrol, a compound from the skin of red grapes…, and latrepirdine, a N-methylD-aspartate receptor antagonist that may also weakly inhibit acetylcholinesterase, which may improve cognitive performance and is currently in phase 3 trials." This would be a treatment that Alzheimer diagnosed patients could take to decrease if not eliminate Alzheimer's disease. Right now, there is not a treatment that doctors and physicians can give to their patients who have been diagnosed with Alzheimer's disease. With this ongoing research, hopefully there will be a treatment to discontinue Alzheimer's disease as a whole by taking a simple pill!

Another big issue that for this research to continue is the lack of funding it has. "NIH is projected to fund $586 million of research in 2015. However, this will fall far short of the $2 billion annually that is projected to be needed over the next 10 years in order to meet the 2025 goal" (Krans, B., & Adcox, M., 2018). Hopefully by the year 2025, funding is expected to sufficient enough to help research find answers for the public.

Conclusion:

Researchers have only recently been studying Alzheimer's disease. This disease in newer to the U.S. and still has a lot to be discovered! "Ninety percent of what we know about Alzheimer's has been discovered in the last 20 years. Some of the most remarkable progress has shed light on how Alzheimer's affects the brain. The hope is that this better understanding will lead to new treatments" (Earlier Diagnosis, 2016). Alzheimer's disease in some cultures is not even recognized. But as the U.S. discovers more and more information out AD it could help many families regain control over their lives in the last stage of life.

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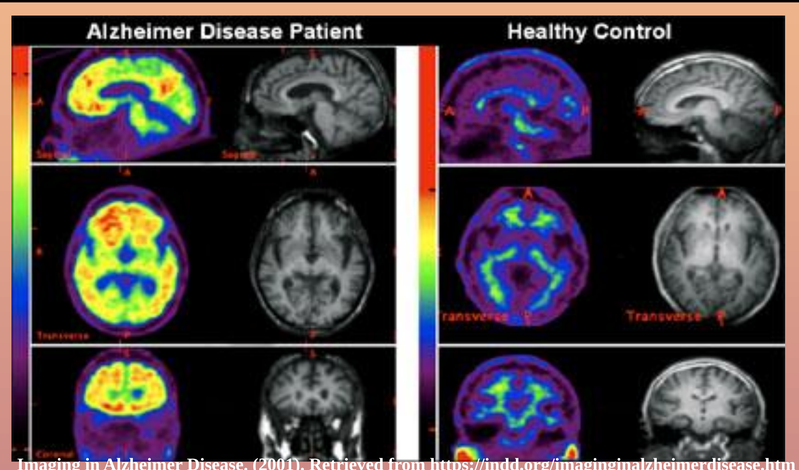

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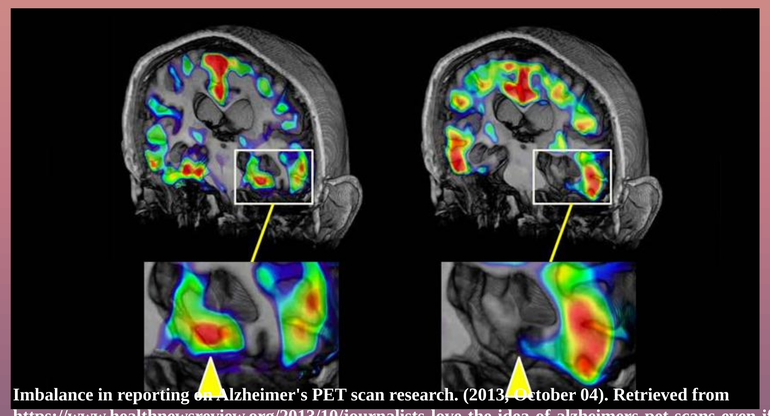

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Pictures:

In both of these pictures, the red and yellow represents the activity that is present within patients that experience Alzheimer's Disease. These hot spots show the presents of Amyloid in the brain which is tied to AD. The healthy brain does not show presence of activity. PET is beginning to pair with MRI scanning, which helps give a more accurate diagnosis. In the second picture, Tau protein tangles that form in Alzheimer's disease are shown. This is where the Amyloid B protein comes into play. Amyloid B is a protein found in the tangles of Tau.

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