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Alzheimer's disease

When we think of Alzheimer's disease we automatically think of older people, and we tend to think of this being something common when it comes to old age. However, there are many biological factors that contribute to this disease besides old age. There is much research that has been done throughout the years in which we get a better understanding of the possibilities of other elements being a factor to this disease. When it comes to Alzheimer's being the most common type of dementia researchers have tried to unravel the many causes and effects one might undergo with having this disease. Alzheimer's has proven to be life altering for many and still surprises researchers on its mechanics.

As Alzheimer's progresses it can affect a person's memory and their physical capabilities depending on the stage one might be on. According to *Neuropathology of Alzheimer's disease*, "From a clinical point of view, AD is staged in four different phases: preclinical, mild, moderate and late-stage. This classification is mainly based on cognitive decline" (*Mt Sinai J Med*. 2010). Having this helps develop a plan on how to treat the person basing it off the stage they might be entering or are currently at. In the article *Alzheimers Dement* mentions, "Although the grade and type of symptoms may vary greatly from person to person, post mortem observations on AD subjects' Central Nervous System (CNS) evidenced some common features: (1) synaptic loss, (2) accumulation of abnormal neurotic plaques and (3) presence of neurofibrillary tangles" (*Jack CR, Jr, Albert MS, Knopman DS, McKhann GM, Knopman DS, Chertkow H*. 2011). This elaborates on how one can see certain functions of a person with this disease start depleting little by little even before the person knows is fully diagnosed. As time goes by for a person with this type of dementia there has been much research that's still ongoing on this matter on how the human body can start digressing at certain rate that even when scientist are using methods to understand it better, it can still be shocking at how progressive it is.

Research has shown us that our genetics can also factor in when it comes to inheriting certain genes that can trigger Alzheimers. Therefore, in the article *Genet Med* clearly states, "Despite a large part of its biological background is not characterized, AD has a strong genetic correlation with 3 genes: APP and the genes for the presenilin 1 (PSEN1) and presenilin 2 (PSEN2) proteins. Alterations within these genes are directly correlated with plaques formation. Literature data demonstrated that subjects inheriting mutations within APP or PSEN1 genes are guaranteed to develop AD, while those inheriting mutations within PSEN2 gene have a 95 percent chance of developing the disease. This factors in how genetically one can inherit this disease if they carry these three genes that are believed to be the cause of this. According to *J Geriatr Psychiatry Neurol*, "it is also often indicated as early onset AD (EOAD). This form presents a clear molecular background and it's easily recognized since it runs in families. Up to 5% of all AD cases are of this type". When a person carries this gene, some are even diagnosed at a younger age then normal in which can be from an alteration from those three genes. There is so much genetics can do to alter this reaction, but sometimes environmental factors can affect it as well.

Oxidative stress has been seen as a possible factor in association with Alzheimers disease. For instance, the article Antioxid Redox Signal, "Cell control on OS is particularly important to maintain the balanced microenvironment needed for multiple biological processes, from bioenergetics to other essential functions such as vesicle transport or post-transcriptional modulations". Like I stated up above stress can contribute to Alzheimer's since neurons tend to be sensitive to antioxidants. According to another article, "ROS can propagate toward the membrane, and then oxidize proteins and nucleic acids, as confirmed by post-mortem AD patients' investigations. In particular, nucleic acid oxidation can cause lethal damage to cell (please refer to Mitochondria section) but can also promote protein aggregation. Indeed, recent observations indicated that Pre-translational mRNA oxidation synthesize peptides that are prone to aggregate (Wilkinson and Landreth 2006). There has been research on patients in which there has been evidence of damage a cell undergoes. When it comes to stress being a known factor as being linked to Alzheimer's disease is still not something that is one hundred percent guaranteed. Many research is still being done in order to prove this theory, but there is a good amount of evidence to back it up.

Although many scientists have different theories on what causes Alzheimer's there are many theories linked to it. Many believe Age is a big factor when it comes to this disease, however there is upcoming evidence proving that it's not the only factor. There is much to consider when the brain is involved since its considered a mystery. No one knows how the brain reacts or works as well as not all brains being the same. We must considered every possibility when it comes to this disease even with all the research being done it's still unknown to many.

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