Assessing Reverse Cholesterol Transport Levels Association to Early-Onset Compared to Late-Onset Alzheimer's Disease

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Alzheimer’s Disease (AD) is a form of dementia that causes major loss of cognitive abilities, affecting daily life. It is necessary to define possible symptoms for early diagnosis purposes. beta-amyloid plaques and neurofibrillary tangles play a part in AD. According to a review by Jia-Hao Sun, Jin-Tai Yu, and Lan Tan, cholesterol in the brain affects the metabolism processes of these amyloid plaques. [27] “Studies have reported that elevated cholesterol levels increase beta-amyloids in cellular and animal models which further associates with the increased risk of AD.” [13] Apolipoprotein e4 (apoE4) is found on chromosome 19, and greatly increases probability of developing AD. This gene is mostly associated with late onset AD, which is diagnosed after the age of 60. The role of ApoE is to transport cholesterol and other lipids to cells and organs. Alzheimer’s Disease Neuroimaging Initiative database was searched and recorded demographic data for over 800 individuals. Although the null hypothesis was not rejected due to the lack of p-values showing correlation between reverse cholesterol transport levels and diagnosis group, it did show the possibilities of other pre-clinical symptoms. A significant p-value of 3.23e-07 showed that those with high cholesterol and APOE 3-3 made mostly 30s on the MMSE. A significant p-value of .04 showed that those with ideal cholesterol levels had higher MMSE scores. A significant p-value of .003 showed that those who had APOE genotype 3-4, 4-4, 2-3, and 3-3 had no parental history of Alzheimer’s disease. Lastly, a significant p-value of 2.09e-12 showed that most individuals who were not diagnosed with anything had APOE 3-3.