

The Effects of Metabolic Syndrome on the Increased Prevalence of Cognitive Decline in Minority Groups

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Category: Masters

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ABSTRACT

Alzheimer's disease is one of the leading causes of dementia, affecting over five million people in the United States. It is clinically diagnosed by the presence of amyloid plaques and hyperphosphorylated tau. Alzheimer's disease patients present with memory and cognitive decline. The cumulative effects of an increasing elderly population and the elevation in the number of persons with diseases such as hypertension, diabetes and obesity, which are risk factors for Alzheimer's disease elevated the interest in understanding the interrelatedness between factors of metabolic syndrome and Alzheimer's disease. The disparity between the incidences of Alzheimer's disease among racial groups in the United States also correlates with the differences in the incidence of metabolic syndrome (MetSyn) among these groups. We hypothesized that persons who are classified as MetSyn will also show deficits in cognition, carotid blood flow and above normal levels of IL-6 and C-reactive protein. We believe that the amalgamation of risk factors associated with MetSyn might offer an explanation for the differential occurrence of Alzheimer's disease in ethnic minority populations in the United States. The study has enrolled 15 participants from the community. Of the 15 participants there are 5 males and 10 females between the ages of 19 and 62, 5 of the participants have two or three risk factors for MetSyn and 7 are members of a minority population. The study is divided into 2 visits; during the first visit, anthropometric measurements and a blood draw for the plasma analysis of interleukin-6 and C-reactive protein are taken. The second visit consisted of the imaging of the carotid artery and the administration of the Penn CNP neurocognitive battery. The battery included measures of working memory, attention, executive function and verbal learning and memory. The data did not show any significant difference between persons that are metabolically compromised and normal controls in the areas of cognitive ability and inflammatory marker concentration. There were gender and racial difference in response times in the cognitive area of working memory with males having lower response times than females and Caucasian having lower response times than minorities, however the differences are not currently significant. The study continues to enroll participants, we believe that with a greater sample size the trends seen in gender and racial population differences will become significant; particularly if we are able to increase the number of persons with metabolic syndrome.