Natural History of Amyloid Deposition in adults with Down Syndrome

https://neurodegenerationresearch.eu/survey/natural-history-of-amyloid-deposition-in-adults-with-down-syndrome/

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USA

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Natural History of Amyloid Deposition in adults with Down Syndrome

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7

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Alzheimer's disease & other dementias

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Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ADRD)... Brain Disorders... Clinical Research... Clinical Research - Extramural... Dementia... Diagnostic Radiology... Down Syndrome... Intellectual and Developmental Disabilities (IDD)... Neurodegenerative... Neurosciences

Research Abstract

DESCRIPTION (provided by applicant): Researchers at the University of Pittsburgh have developed a pioneering, non-invasive, in vivo PET tracer for use in imaging amyloid deposition in living humans. The tracer, originally called [C-11]6-OH-BTA-1, has become commonly known as Pittsburgh Compound-B (PiB). This compound has shown much promise in documenting pre-symptomatic amyloid deposition in living subjects destined to develop Alzheimer's disease (AD). In addition, PiB provides a means to determine the natural history of amyloid deposition in these subjects. While there has been increasing use of PiB as a tool for assessing amyloid deposition in cognitively normal individuals (both with and without symptoms of AD), the fact remains that despite identifiable risk factors that increase the likelihood of acquiring AD (e.g., increased age, presence of the apolipoprotein-E4 (ApoE4) allele), there is currently no way to identify with certainty those individuals that are destined to develop AD. This makes the study of pre-clinical amyloid deposition difficult in the general population. Conversely, individuals with Down syndrome (DS) are at high risk for developing AD due to the presence of an extra copy of chromosome 21, which codes for the Aß precursor protein (APP) gene. In fact, post-mortem studies have documented the presence of AD pathology in 60 to 90% of adults with DS (with greater pathology with increasing age). Additionally, symptoms consistent with a diagnosis of AD occur in over 40% for DS individuals between 50 and 59 years of age. Thus, the study of adults with DS provides a rare opportunity to follow a group of individuals at high risk for developing AD neuropathology and symptomotology. The goal of the current proposal is to document amyloid deposition in 84 asymptomatic adults with DS and to follow these individuals to understand the course of amyloid deposition and its effect on functioning over time. The study will focus on DS individuals over the age of 30, a group who is at risk for the presence of amyloid plaque and for the development of AD. Amyloid deposition (as measured by PiB-PET) will be compared to typical AD cases, typical controls, as well as to a small group of individuals with DS who have been diagnosed with AD. Additionally, we will assess for the presence of the ApoE4 allele to examine its possible association with accelerated deposition of amyloid plaque. Extensive neuropsychological testing will also be conducted to document current functioning levels. Subjects found to have detectable amyloid plaque will be followed at 24 month intervals to document the natural history of amyloid deposition and to determine if they are on a predictable trajectory toward clinical AD. Similarly, subjects who show no evidence of amyloid deposition will be also be followed at 24 month intervals, allowing the possibility of detecting th very onset of amyloid deposition. The follow-up studies proposed will likely provide important information regarding the natural history of amyloid deposition in DS subjects. This data is necessary to deepen our understanding of the pathophysiology of AD in Down syndrome and may have additional implications for the general population.

Lay Summary

Adults with Down syndrome (DS) are at an extremely high risk for developing Alzheimer's disease (AD), with most individuals over age 40 evidencing amyloid deposits (which are thought to be associated with the appearance of symptoms). The goal of the current proposal is to document amyloid deposition in 84 asymptomatic adults with DS and to follow these individuals to understand the course of amyloid deposition and its effect on functioning over time. This data is not only necessary to deepen our understanding of the pathophysiology of AD in DS but may also offer information that will prove useful in the prevention and treatment of AD in the general population.

Further information available at:

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Investments > €500k

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