

Research Frontiers: Trials of the Mind.

Kennedy Krieger researchers hope that advancements in Alzheimer's disease will address early memory loss and other symptoms of individuals with Down Syndrome.

By Holly Lewis Maddux

Researchers at Kennedy Krieger Institute are investigating two experimental treatments that it is hoped will slow or stop the progress of Alzheimer's disease in people with Down syndrome.

Individuals with Down syndrome develop the clinical symptoms of Alzheimer's disease much earlier in life than people without the syndrome. By age 35, all people with Down syndrome have experienced biological changes in the brain that set the stage for Alzheimer's disease, and by age 55 or 60, many of those individuals have significant memory deterioration, loss of alertness and other symptoms.

Recent studies on prevention and treatments for Alzheimer's disease in the general population have resulted in new therapies that have shown very promising results. Researchers at Kennedy Krieger are now applying these findings to studies involving individuals with Down syndrome.

The first study, a large, US-based, clinical trial sponsored by a major pharmaceutical company, is designed to determine whether an investigational drug can compensate for the effects of a decrease in the production of an important neurotransmitter, acetylcholine, which occurs in all people with Down syndrome between the ages of 18 and 35. A decrease in acetylcholine, which facilitates memory and related cognitive functions in the brain, sets the stage for the eventual onset of clinical symptoms of Alzheimer's disease. When the investigational drug was tested on persons in the general population who have Alzheimer's, but do not have Down syndrome, it was found to be helpful in delaying the progression of symptoms in the early stages of the disease.

Nineteen-year-old Daniel Harmon of Frederick, Md., recently joined the Kennedy Krieger study. He and his mother, Anne Harmon, make the hour-long trip from their home in Western Maryland to Kennedy Krieger's downtown Baltimore location every few weeks. "My step-father suffered from Alzheimer's, and his decline was very difficult on the family. I was interested in seeing that Daniel participate, because we want to do anything we can to help find a treatment to slow or stop Alzheimer's in people who have Down's syndrome."

Participants in the study are required to take the investigational drug (or a placebo) daily over a 12 -week period, and during that time, to visit the clinic four times for evaluation. A number of tests are administered during these visits to evaluate memory, thinking skills, behavior, daily functioning and speech/language. Periodically, participants are given physical and neurological examinations, as well.

The second study that is underway at Kennedy Krieger's Down Syndrome Clinic focuses on older persons with Down syndrome. In this study, individuals over the age of 50 are administered high doses of Vitamin E to determine whether it can help stop or slow the decline in memory, thinking, speech, and self-help skills that are associated with Alzheimer's, by protecting brain cells from damage produced through a naturally occurring process known as oxidative stress.

Oxidative stress is a bi-product of the process by which cells make energy, and its effects over time are an inevitable part of the aging process. "Because the aging process is accelerated in persons with Down syndrome, the deleterious effects of oxidative stress emerge earlier in the lifetime than they do in the general population. Therefore this treatment, if it proves effective, could have particularly far-reaching consequences for persons with Down syndrome," says Dr. Capone.

The Vitamin E trial is funded by the National Institutes of Health and is being conducted at research centers in the United States and in Europe.

For more information about the Down Syndrome Clinic, contact Heather Kammann at (443) 923-9132.