
Alzheimer's and Related Diseases Research Award Fund

2004-2005 FINAL PROJECT REPORTS

UVA Kathleen Fuchs, Ph.D. (Department of Neurology) "Beyond Memory Impairment in MCI: Executive Abilities and Implications for Functioning"

Mild Cognitive Impairment (MCI) is a term used to describe the functioning of elderly adults who demonstrate cognitive deficits that are not severe enough to warrant a diagnosis of dementia. Individuals with MCI have been shown to be at increased risk for developing Alzheimer's disease (AD). Because memory impairment is a hallmark symptom of AD, studies of MCI have not focused on other brain systems that are critical to the expression of AD, e.g., those involved in executive functioning (abstract reasoning, novel problem solving, ability to recognize and correct mistakes, and ability to think flexibly). In this study, individuals who mainly exhibit a decline in memory functioning (amnestic MCI) were compared with those whose main area of difficulty is in another cognitive domain (nonamnestic MCI) through evaluations of executive functioning, medication management, driving skills, and Magnetic Resonance Spectroscopy (MRS) in specific brain structures implicated in Alzheimer's disease. There were no statistically significant differences between the two MCI groups on the MRS evaluation. Other results, however, indicate that individuals who carry a clinical diagnosis of MCI exhibit reduced ability in aspects of executive functioning regardless of whether they show prominent memory deficits. Although not impaired, performance was below expectation relative to very high premorbid or baseline functioning on most measures of executive abilities. There was an indication of relatively greater decline on tasks with higher response inhibition and mental flexibility demands than on tasks that primarily tap reasoning and abstraction skills. This decline correlated with performance on a "real world" task of medication management and suggests that individuals with MCI may have greater difficulty with complex activities of daily living than has been supposed. While nearly all subjects in the study had memory complaints, most showed decline in cognitive domains outside of memory functioning, and these declines could have significant implications for an individual's ability to manage complex tasks independently.

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UVA David S. Geldmacher, M.D. (Department of Neurology) "Eye-Movement Approaches to Information Processing Abnormalities in Mild Cognitive Impairment"

MCI is characterized by measurable difficulties with memory or other thought processes (cognition) that are more severe than expected for age, but which do not interfere with a person's usual activities. When examining complex visual scenes, individuals with AD have abnormal eye-movement patterns that contribute to their problems in processing visual information. MCI is often a transitional state between healthy aging and AD, and can also be associated with problems in visual processing. This study used a computerized eye-tracking system to compare the eye movements of people with MCI and cognitively healthy adults without significant memory impairment as they scanned visual images of varying complexity. Usable eye-movement data from 19 subjects indicated that although healthy subjects had significantly higher scores on tests of general cognition and memory, the groups did not differ in picture naming ability. Consistent with the hypothesis of the study, individuals with MCI showed significant differences in eye-movement during examination of complicated images that required more intensive information processing. The MCI subjects required more eye movements and had a less efficient search pattern on tasks that require discerning a figure from a complicated background. However, on a simpler object-naming task no differences in eye-movements were observed between groups. The findings suggest that patients with MCI have deficits on tasks requiring complex visual information processing, and have important implications for activities like employment and driving.

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VA Tech Anne Glass, Ph.D. (Center for Gerontology) “The End-of-Life Care Experience for Alzheimer’s Patients and Their Families”

In today's "death-denying" society, end-of-life care is still a topic often avoided. Therefore, little is known about it, and perhaps least of all about how persons with Alzheimer's and related diseases die. The challenges of providing quality end-of-life care are intensified for this population, given the lack of a predictable trajectory and the communication issues that can arise due to the disorientation of the individuals. Use of hospice is a relatively new development. In this partially-funded pilot project, a qualitative interview instrument was developed to use with four family members after the death of their loved ones. The four cases, two males and two females varying in age from 65 to their 80s, revealed a range of end-of-life experiences, suggesting that there is not just one “good” path. The extent of care needed, the responsiveness of the family member, the health of the caregiver(s), and the housing and support situations can all intersect in a variety of ways that make no one scenario the answer for all. Although most people say they would prefer to die at home, in some situations the nursing home can be a satisfactory choice, particularly if hospice is involved. The project produced a new instrument that can be adapted for future research to address the care needed, as well as a broader definition of the environment and how it supports the end-of-life experience for patients and their families.

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Mountain Empire Older Citizens, Inc. Marilyn Pace Maxwell, M.S.W., and Michael Creedon, D.S.W. “Developing, Implementing, and Evaluating Training Modules for High School Students to Teach Alzheimer’s Caregivers to Use the Internet Effectively as a Tool to Assist in Caring for Their Family Members”

A previous ARDRAF-funded study by Creedon and Maxwell determined that a majority of the Alzheimer’s caregivers surveyed in the Big Stone Gap region would like to be trained on the use of personal computers as a tool to assist them with their caregiving responsibilities; and that these caregivers would welcome instruction about the use of a computer and the Internet from a high school student with specialized training on AD and working with family caregivers. Working in cooperation with Wise County Schools, LENOWISCO Planning District Wired Community Project, and the University of Virginia’s Health Sciences Library Outreach at Wise, the currently-funded investigation recruited 25 senior Caregivers, who wished to use computers and the Internet to help with caregiving duties, and 17 Teen Volunteer trainers from the junior class at Powell Valley High School. The project developed in-depth training for the Teen Volunteers that focused on Understanding Alzheimer’s Care and Helping the Senior Citizen Learner, and five training modules for use by the Volunteer Teens in one-on-one training with Caregivers. With assistance from the region’s Chapter of the Alzheimer’s Association, project staff held three training sessions for Teen Volunteers and then paired them with Caregivers in two combined group training programs. Evaluation results from both the Teen Volunteers and the Caregivers documented the success of the project. Caregivers appreciated the assistance from Teen Volunteers and the skills offered to them. The program lessened Caregivers’ feelings of isolation and lack of confidence in their ability to learn. Teen Volunteers learned a great deal about caregiving and gained a new understanding of the difficulties faced by family caregivers of those with Alzheimer’s disease. They also became more knowledgeable about teaching adult learners and gained insights into their own lives. Recorded observations by the project leaders suggested that the training materials were appropriate for both groups and offered suggestions for future efforts. Eventual statewide replication of the collaboration, *Big Stone Gap Teens and Caregivers: Across the Tech Divide*, could significantly increase the ability of caregivers to make use of information technology as a caregiving resource.

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