Memory Care Monthly

Supporting Healthcare Professionals in Caring for the Aging September / October 2009

NATIONAL ALZHEIMER'S DISEASE AWARENESS MONTH

November is national Alzheimer's disease awareness month, and various efforts to raise awareness about this disease will be taken place in November.

National Memory Screening Day on November 17, 2009

With a collaborative effort led by the Alzheimer's Foundation of America, more than 2000 community sites will be offering free memory screening to the public. For more information about the screening sites and how to become a site, please visit:

http://www.nationalmemoryscreening.org

MCC Offers Free MCI Screen Access for National Memory Screening Day

To support National Memory Screening Day, Medical Care Corporation is offering all screening sites free access to the MCI Screen for that day. The MCI Screen is the most accurate memory assessment for detecting early stage memory loss and can be administered in about ten minutes without specialized training. Internet access is required for the test administrator.

Any screening sites who wish to use the MCI Screen, please contact via email at:

customerservice@mccare.com

Please make sure to reference "National Memory Screening Day" in the subject line. We will respond immediately to help you establish a free account.

WHAT'S NEW?

FOR DAILY NEWS, VISIT OUR BLOG: "BRAIN TODAY"

News reports about brain health are published every day. The news covers many related topics such as memory loss, Alzheimer's disease, drugs and treatments, risk factors, diagnostic tests, and published discoveries across the field. Some of the news is objectively reported, some is over-sensationalized, and some is intentionally misleading. This blog is devoted to interpreting the daily news and to distilling its true value.

http://braintoday.blogspot.com

FEATURED ARTICLE

PROGRESSION OF MCI TO DEMENTIA IN CLINIC- VS. COMMUNITY-BASED COHORTS

While mild cognitive impairment (MCI) has been recognized as a high risk for progressing to dementia, annual conversion rates vary across different studies with clinic-based samples showing higher rates of conversion than community-based samples.

Dr. Sarah Tomaszewski Farias from the Department of Neurology and Public Health, UC Davis, and her colleagues conducted a prospective, longitudinal study to establish whether the rates of conversion from MCI to dementia are different according to recruitment source and, if so, to investigate factors that might explain such difference.

A total of 111 patients (51 through clinic referral and 60 through community outreach) with baseline evaluations of MCI were recruited into the present study, and were followed longitudinally for an average of 2.4 years (range: 0.5-4.0 years).

During the follow-up period, 28 individuals progressed to dementia with a mean (sd) time to conversion of 2.19 (0.72) years. The clinic sample had an annual conversion rate of 13%, while the community sample had an annual conversion rate of 3%. In a Cox proportional hazards model, the clinic recruitment source alone was associated with an increased hazard of incident dementia. When other variables were added to the model, only baseline functional impairment, as measured by the Clinical Dementia Rating Scale, and no demographic, cognitive, or neuroimaging variables or MCI subtypes accounted for the differences in conversion rates across the 2 cohorts.

These results suggest that the degree of functional impairment is an important predictor of conversion to dementia and may explain differences in findings between community-based and clinic-based studies.

Farias ST et al. Arch Neurol. 2009; 66(9):1151-7.

RESEARCH UPDATES

THE MEMORY SCREENING OUTREACH PROGRAM: A LARGE COMMUNITY-BASED SAMPLE OF MIDDLE-AGED AND OLDER ADULTS

Several studies report the efficacy of community-based memory and dementia screening programs. In this particular study, Dr. W. David Crews from the Department of Psychology, Behavioral Neuroscience Laboratory, Virginia Polytechnic Institute and State University and his colleagues examined the descriptive, clinical, and outcomes characteristics of participants attending the Memory Screening Outreach Program (MSOP).

The program provided free screenings of participants' short-term memory processes, neurocognitive complaints, and depressive and psychiatric symptoms. At 16 screening sites, 1000 community-based persons aged 44-91 participated in the program. Screening results were

subsequently forwarded to participants and their designated healthcare providers (HCPs), and then approximately 8 weeks later, participants who received follow-up recommendations were mailed a survey assessing screening-related outcomes.

Results indicated that 44.3% of the MSOP participants received follow-up recommendations secondary to age-inappropriate memory impairments, depressive or psychiatric symptoms, significant neurocognitive complaints, need for respite, or a combination thereof. Memory impairments and depressive or psychiatric symptoms contributed, at least in part, to the recommendations of 24.0% and 30.9% of the sample, respectively. The prevalence of impaired Wechsler Memory Scale-III subset performances ranged from 20.5% to 5.4%, and 28.7% of the participants exhibited high depression inventory scores.

Of the participants who returned follow-up surveys, 49.5% visited their primary HCPs regarding their screening results, and contributing conditions and diagnoses were identified in 50.9%, medication or supplement recommendations or regimen changes were provided to 47.1%, and 17.0% were referred to healthcare specialists. Of the participants who had not followed up, 36.8% indicated plans to do so.

This study showed the MSOP's efficacy in identifying age-inappropriate memory impairment, notable depressive and psychiatric symptoms, and significant neurocognitive complaints, which contributed to the identification and treatment of a diversity of conditions at follow-up.

Crews WD et al. JAGS. 2009; 57(9):1697-703.

GAMMA-BAND SYNCHRONIZATION IN THE MACAQUE HIPPOCAMPUS AND MEMORY FUNCTION

Neuronal synchronization in the gamma band (30-100 Hz) has been suggested to play an important role in mediating cognitive processes. Gamma-band synchronization provides for the optimal temporal relationship between two signals to produce the long-term synaptic changes that have been theorized to underlie memory formation. Although neuronal populations in the hippocampus oscillate in the gamma range, the role of these oscillations in memory formation is not clearly understood.

To investigate this issue, Dr. Michael J. Jutras and his colleagues from Yerkes National Primate Research Center, Atlanta, GA, recorded neuronal activity in the hippocampus while macaque monkeys performed a visual recognition memory task.

During the encoding phase of this task, hippocampal neurons displayed gamma-band synchronization. In addition, enhanced gamma-band synchronization during encoding predicted greater subsequent recognition memory performance. These changes in synchronization reflect enhanced coordination among hippocampal neurons and may facilitate synaptic changes necessary for successful memory encoding.

Jutras MJ et al. J Neurosci. 2009; 29(40):12521-31.

FUNCTIONAL CONNECTIVITY AND AMYLOID BURDEN

Although amyloid deposition is present in 20-50% of non-demented older adults, the functional consequences are not yet clearly known.

To examine a correlation between amyloid accumulation and functional disruption of the default

network, Dr. Trey Hedden and his colleagues from the Martinos Center for Biomedical Imaging, Charlestown, MA, examined 38 clinically normal subjects aged 60-88 years. Using 11C-labeled Pittsburgh Compound B positron emission tomography imaging and functional magnetic resonance imaging (fMRI), they estimated fibrillar amyloid burden in the brain. The integrity of the default network was estimated by correlating resting state fMRI time courses extracted from a priori regions including the posterior cingulated, lateral parietal, and medial prefrontal cortices. Functional disruption of the default network was measured by intrinsic activity correlations.

Clinically normal subjects with high amyloid burden showed significantly reduced functional correlations with the default network relative to subjects with low amyloid burden. These reductions were observed when amyloid burden was treated as a continuous, rather than a dichotomous, measure and when researchers controlled for age and structural atrophy.

Whole-brain analyses initiated by seeding the posterior cingulated cortex, a region of high amyloid burden in Alzheimer's disease, revealed significant disruption in the default network including functional disconnection of the hippocampal formation.

These results suggest that there is a disruption of functional connectivity by high amyloid burden.

Hedden T et al. J Neurosci. 2009; 29(40):12686-94.

PHYSICAL ACTIVITY AND EXECUTIVE FUNCTION IN AGING; THE MOBILIZE BOSTON STUDY

Dr. Laura H. P. Eggermont from the Department of Clinical Neuropsychology, VU University, Amsterdam, the Netherlands, and Alzheimer's Disease Center, School of Medicine, Boston University, and her colleagues conducted a population-based cross-sectional study to determine the relationship between physical activity and cognition, specifically executive function, and the possible mediating role of factors such as cardiovascular disease (CVD) and CVD risk factors, chronic pain, and depressive symptoms.

544 individuals over 70 years old (mean age 78; female 62%) in the Boston area participated to the study. Presence of heart disease (self-reported physician diagnosis), pain, and depressive symptomatology were assessed using interviewer-administered questions. Blood pressure was measured. Engagement in physical activity was determined using the Physical Activity Scale for the Elderly (PASE). Cognitive function was measured using a neuropsychological test battery.

The results showed that the older adults who engaged in more physical activity had significantly better performance on all cognitive tests, except for Letter Fluency and the delayed recall memory performance after adjusting for age, gender, education, and total number of medications. With further adjustment for CVD and CVD risk factors (heart disease, diabetes mellitus, stroke, and hypertension), pain, and depressive symptoms, the PASE score remained significantly associated with executive function tests.

This study supports the idea that the correlation between physical activity and executive function represents a specific biologically determined relationship.

Eggermont LHP et al. JAGS. 2009; 57(10):1750-6.

MODERATE ALCOHOL INTAKE AND RISK OF FUNCTIONAL DECLINE: THE HEALTH, AGING, AND BODY COMPOSITION STUDY

A group of researchers studied 3,061 adults aged 70-79 without mobility disability at baseline to investigate the relationship between alcohol consumption and incident mobility limitation. This study was a part of the Health Aging and Body Composition study, conducted in Memphis, Tennessee, and Pittsburgh, Pennsylvania.

Incidence of mobility limitation (defined as self-report at two consecutive semiannual interviews of any difficulty walking one-quarter of a mile or climbing stairs), and incidence of mobility disability (defined as severe difficulty or inability to perform these tasks at two consecutive reports) were measured. Alcohol intake, lifestyle-related variables, disease, and heath status indicators were assessed at baseline.

Results showed, during a follow-up time of 6.5 years, that participants consuming moderate levels of alcohol had the lowest incidence of mobility limitation (total: 6.4 per 100 person-years) and mobility disability (total: 2.7 per 100 person-years). Adjusting for demographic characteristics, moderate alcohol intake was associated with lower risk of mobility limitation and mobility disability than zero or occasional consumption. Additional adjustments for lifestyle-related variables substantially reduced the strength of the associations. Adjustments for diseases and health status indicators did not affect the strength of the associations, suggesting that lifestyle is the most important in confounding this relationship.

Maraldi C et al. JAGS. 2009; 57(10):1767-75.

APOLIPOPROTEIN E GENOTYPE AND WHITE MATTER LESION LOAD

The relationship between white matter lesions (WMLs) and the apolipoprotein E (ApoE) genotype has been controversial from cross-sectional studies and, to date, no longitudinal finding has been reported.

Researchers from the Neuroepidemiology, Hôpital la Salpétrière, Paris, France, investigated whether the ApoE genotype influences baseline and evolution over 4-years follow-up of WML volumes in a population-based sample of 1,779 non-demented subjects aged 65-80 years old. The sample had 2 cerebral MRIs, at study entry and at 4-year follow-up. WML volumes were estimated using a fully automatic procedure. The covariance analysis was performed to evaluate the relationship between ApoE genotype and WML load and progression.

Multivariable analyses showed that individuals E4/E4 had both significantly higher WML volume at baseline and higher WML increase over a 4-year follow-up than non-carriers and heterozygous of the E4 allele for ApoE genotype.

This study suggests that it might be important to take into account WML severity when assessing the relationship between ApoE and dementia.

Godin O et al. Stroke. 2009; 40:3186-90.

TRANSITION FROM HEALTHY AGING TO ALZHEIMER'S DISEASE

Identification of the earliest cognitive changes in Alzheimer's disease (AD) is important, yet is very difficult. Dr. David K. Johnson from the Department of Psychology, University of Kansas, and his colleagues conducted a study to model the cognitive decline (e.g. inflection point in longitudinal cognitive performance) in preclinical AD.

Longitudinal archived data from individuals who became demented (n=134) during follow-up

(mean 5.9 years) and people who remained non-demented (n=310) on each 4 cognitive factors (global, verbal memory, visuospatial, and working memory) were included. Data from 44 autopsy-confirmed cases were also included.

The best fitting model for each of the 4 factors in the stable group was linear, with a very slight downward trend on all but the Visuospatial factor. In contrast, a piecewise model with accelerated slope after a sharp inflection point provided the best fit for the group that progressed. The optimal inflection point for all 4 factors was prior to diagnosis of dementia (Global: 2 years; Verbal and Working Memory: 1 year; Visuospatial: 3 years).

This study shows that there is a sharp inflection point followed by accelerating decline in multiple domains of cognition including memory in the preclinical period in AD when there is insufficient cognitive decline to warrant clinical diagnosis using conventional criteria. Early change was observed in tests of visuospatial ability, most of which were speeded. This suggests that early detection of cognitive disorders using multi domain cognitive factors may be more sensitive to all of the early manifestations of disease.

Johnson DK et al. Arch Neurol. 2009: 66(10);1254-9.

TREATMENT OF VASCULAR RISK FACTORS SLOWS COGNITIVE DECLINE IN ALZHEIMER'S

A research group lead by Dr. Yan Deschaintre from the Université Lille Nord de France, France, investigated whether treating vascular risk factors (VRF) can slow down the progression of Alzheimer's disease (AD).

They recruited 301 patients who had AD without cerebrovascular disease (CVD) (mean age 71.7; female 69.4%; first MMSE score 21.6; mean follow-up 2.3 years), who attended a memory clinic between 1997 and 2003. VRF's included high blood pressure, dyslipidemia, diabetes mellitus, tobacco smoking, and atherosclerotic disease. Only 21 patients (7.0%) had no VRF's. Others were classified as having no VRF's treated (n=72; 25.7%), some VRF's treated (n=119; 42.5%), or all VRF's treated (n=89; 31.8%). MMSE score progression over time among these 3 groups using a mixed random effect regression model was compared.

The results show that MMSE progression over time differed significantly between groups with adjustments for confounding factors while baseline MMSE scores were similar among 3 groups. Patients with all their VRF's treated declined less than those with none of their VRF's treated. Those with some VRF's treated tended to have an intermediate decline.

This study suggests that treatment of VRF's is associated with a slower cognitive decline measured by MMSE score in patients with AD without CVD, and warrants larger randomized controlled trials.

Deschaintre Y et al. Neurology. 2009: 73(9);674-80.

ASSOCIATION OF HIGHER DIASTOLIC BLOOD PRESSURE LEVELS WITH COGNITIVE IMPAIRMENT

Dr. Georgios Tsivgoulis from the Comprehensive Stroke Center, University of Alabama at Birmingham, and his colleagues evaluated the cross-sectional relationship of blood pressure (BP) components with cognitive impairment after adjusting for potential confounders.

The present analysis included 19,836 participants, who had no history of stoke or TIA, with complete baseline physical and cognitive evaluations from the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study. The REGARDS study is a national, longitudinal population cohort evaluating stroke in 30,228 black and white men and women aged 45 or older. During an in-home visit, BP measurements were taken as the average of 2 measurements. Incremental logistic models examined baseline relationships between BP components (systolic BP [SBP]; diastolic BP [DBP]; and pulse pressure [PP]) and impaired cognitive status (score of 4 or less on 6-Item Screener) after adjusting for demographic and environmental characteristics, cardiovascular risk factors, depressive symptoms, and current use of any antihypertensive medications.

Results show that higher DBP levels were associated with impaired cognitive status after adjusting for demographic and environmental characteristics, risk factors, depressive symptoms, and antihypertensive medications. An increment of 10 mm Hg in DBP was associated with a 7% higher odds of cognitive impairment. No independent association was identified between impaired cognitive status and SBP or PP. There was no evidence of nonlinear relationships between any of the BP components and impaired cognitive status. There was no interaction between age and the relationship of impaired cognitive status with SBP, DBP, or PP levels.

This study shows that higher diastolic blood pressure was cross-sectionally and independently associated with impaired cognitive status in this large, geographically dispersed, race- and gender-balanced sample of stroke-free individuals.

Tsivgoulis G et al. Neurology. 2009; 73(8):589-95.

CIGARETTE SMOKING AND BRAIN LESIONS IN MULTIPLE SCLEROSIS

Cigarette smoking has been linked to higher susceptibility and increased risk of progressive multiple sclerosis (MS). However, its effect on MRI characteristics of patients with MS has not been well studied.

Research conducted by Dr. Robert Zivadinov from the Buffalo Neuroimaging Anaysis Center and his colleagues compared the MRI characteristics in cigarette smoker (n=128; 34.8%) and nonsmoker patients (n=240) with MS.

The results showed that smoking was associated with increased Expanded Disability Status Scale (EDSS) scores. Adverse associations were observed between smoking and the lesion measures including increased number of gadolinium contrast-enhancing lesions, T2 lesion volumes, and T1 lesion volumes. Smoking was also associated with decreased brain parenchymal fraction and with increases in the lateral ventricle volume and third ventricle width.

Zivadinov R et al. Neurology. 2009; 73(7):504-10.

APOE GENOTYPE AND FAMILY HISTORY

Researchers from the University of Regensburg School of Medicine, Regensburg, Germany, investigated whether a positive family history and ApoE E4 genotype is prevalent among dementia patients with onset before 70 years of age compared with healthy spousal controls.

A total of 210 patients with dementia and 82 spousal control participants were evaluated with neuropsychiatric examination, CERAD battery, clock-drawing test, and ApoE genotyping. Dementia diagnosis included Alzheimer's disease (AD), vascular dementia, frontotemporal

dementia, Lewy body dementia, mixed dementia, multisystem atrophy, Parkinson's disease dementia, and olivopontocerebellar atrophy.

Of the 131 patients with AD dementia, 25 had E4/E4. Among dementia patients with a positive family history (n=83), E4/E4 was found in 19 (22.9%). A positive family history was highest among E4/E4 AD patients (72.0%) and lowest among the cognitively normal spousal controls (9.3%).

In this sample of patients with dementia due to AD, approximately 3 out of 4 (72.0%) had E4/E4 when they had a positive family history supporting the hypothesis that Apo E4 exerts its maximal effect before age 70 years.

Zintl M et al. AJADD. 2009; 24(4):349-52.

CONVERSION OF AMYLOID POSITIVE AND NEGATIVE MCI TO AD OVER 3 YEARS

A group of researchers have assessed the rates of conversion from mild cognitive impairment (MCI) to Alzheimer's disease (AD) during a 3-year follow-up period in patients with positive and negative amyloid load measured by 11C-PIB PET.

A total of 31 patients with MCI were recruited. Of 31, 17 (55%) with MCI had increased 11C-PIB retention at baseline, and 14 of these 17 (82%) clinically converted to AD during follow-up. Only one of the 14 PIB negative MCI cases converted to AD. Of PIB positive patients with MCI, half (47%) converted to AD within 1 year of baseline PIB PET, these faster converters having higher tracer-retention values than slower converters in the anterior cingulated and frontal cortex. Seven of 17 (41%) patients with MCI with known ApoE status were E4 carriers, which was associated with faster conversion rates in PIB-positive patients with MCI.

This study showed that PIB-positive patients with MCI are significantly more likely to convert to AD than PIB-negative patients, and that faster converters also have higher PIB retention levels at baseline than slower converters.

Okello A et al. Neurology. 2009; 73(10):754-60.

Free Patient Brochure

Make sure your patients know that you now offer memory assessment services. We can send you complimentary copies of our educational patient brochure, "About Memory Loss", in English and Spanish. To request copies, please email us at: customerservice@mccare.com and include the address to where you would like the brochures mailed.

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