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News briefing: Sunday, July 11, 2010, 6:00-7:00 am, Hawai'i Convention Center, 1801 Kalakaua Avenue, Honolulu, Room 321A.

- Zaldy S. Tan, et al. Physical Activity and the Risk of Dementia: The Framingham Study. (Funded by: National Institutes of Health; National Heart, Lung, and Blood Institute; National Institute on Aging)
- Lenore Arab, et al. Tea, coffee and cognitive decline in the elderly: The Cardiovascular Health Study. (Funded by: Unilever's Lipton Institute of Tea)
- David J. Llewellyn, et al. Vitamin D and Cognitive Impairment in NHANES III. (Funded by: National Institute on Aging, National Health Service Southwest Region Public Health Training Scheme)
- Abha Chauhan, et al. Walnuts-rich diet improves memory deficits and learning skills in transgenic mouse model of Alzheimer's disease. (Funded by: California Walnut Commission)

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Control #: 10-A-2623-ALZ

O1-01 - Prevention 1; Presentation #O1-01-03; Speaking Time: 7/11/2010 1:30-1:45 PM

Physical Activity and the Risk of Dementia: The Framingham Study

Zaldy S. Tan^{1,2}, Alexa S. Beiser³, Rhoda Au⁴, Margaret Kelly-Hayes⁴, Ramachandran S. Vasan⁵, Sanford Auerbach⁴, Joanne Murabito⁴, Aleksandra Pikula⁴, Philip A. Wolf⁴, Sudha S. Seshadri⁴
1GRECC, VA Boston Healthcare System; Division of Aging, Brigham & Women's Hospital; Harvard Medical School, Boston, MA, USA; 2Division of Aging, Brigham and Women's Hospital, Boston, MA, USA; 3Dept of Biostatistics, Boston University School of Public Health, Boston, MA, USA; 4Dept of Neurology, Boston University School of Medicine, Boston, MA, USA; 5Dept of Medicine, Boston University School of Medicine, Boston, MA, USA.

Contact e-mail: ztan@hms.harvard.edu

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Background: Several longitudinal epidemiological studies have related physical activity and cognitive decline, dementia and/or Alzheimer's disease (AD); of these the majority demonstrated a significant and independent inverse relationship between physical activity and cognitive decline and/or risk of dementia, although several large cohort studies failed to show an association. Most of these studies followed participants for \leq 6 years or had significant loss to follow-up and thus, further studies including long-term follow-up in persons in the eighth decade (maximal age-specific risk of incident AD) are warranted to elucidate the true relationship.

Methods: The Framingham Study Original cohort is a longitudinal community-based sample evaluated biennially since 1948 for cardiovascular risk factors. The physical activity index (PAI), a 24 hour, subject-specific measure of level of physical activity, based on estimating hours spent performing specific activities and weighting each activity by an assigned caloric equivalent, was measured during the 20th examination cycle (1986-87). Dementia-free participants who attended the 20th examination cycle and had available PAI were eligible for the present investigation (n=1,211; 742 F; age 76+5) PAI scores were divided into quintiles, from low (Q1) to highest (Q5), with Q1 referent. All participants were followed

prospectively for the development of incident dementia and Alzheimer's disease (AD) according to DSM-IV/NINCDS-ADRDA criteria.

Results: Over two decades of follow-up (mean 9.9 +/-5 years), 242 participants developed dementia (193 AD). We observed that participants who reported moderate to heavy physical activity had a lower risk of all-cause dementia (HR=0.55, 95% C.I.0.37-0.81;p=0.003) after adjusting for age and sex. Further, participants in the lowest quintile of PAI (Q1) had an increased risk of incident dementia compared to those in higher quintiles (HR=1.45, 95% C.I. 1.06-1.98,p=0.021). Similar results were seen when analyses were limited to incident AD alone, and when excluding persons with mild cognitive impairment at baseline. Stratified analyses showed that the associations observed were largely evident in men.

Conclusions: Moderate to heavy physical activity is associated with a reduced risk for dementia, for up to two decades of follow-up. Our data emphasize that a reduced risk of dementia may be one additional health benefit to adults of maintaining at least moderate physical activity.

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Control #: 10-A-1400-ALZ

O1-06 - Epidemiology: Diet and Intervention (Presentation #: O1-06-05; Speaking Time: 7/11/2010 2:00-2:15 PM)

Tea, coffee and cognitive decline in the elderly: The Cardiovascular Health Study

Lenore Arab¹, Mary Lou Biggs², Ellen S. O'Meara³, Annette L. Fitzpatrick², William T. Longstreth²
1UCLA, Los Angeles, CA; 2U Washington, Seattle, WA; 3Group Health Research Institute, Seattle, WA.
Contact e-mail: larab@ucla.edu

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Background: Although several cross sectional observational studies have shown positive associations between consumption of either tea and cognitive function in older adults, data from prospective analyses with long-term follow-up and rate of change in cognitive function is lacking.

Methods: We used data on 4,809 men and women aged 65 and older from the Cardiovascular Health Study to examine the relationship between consumption of tea, coffee, and change in cognitive function over time. Usual consumption was assessed using a food frequency questionnaire at baseline. Cognitive performance was assessed using the Mini-Mental State Examination (3MSE) administered at baseline and annually up to 8 times. We used linear mixed models to estimate the rate of change in cognitive scores associated with baseline consumption.

Results: At baseline, 43% participants reported drinking coffee and 25% tea daily. The average annual rate of decline in cognitive tests scores was -1.17 for the 3MSE over a mean 7 examinations. In a model including both tea and coffee, age, gender, education, smoking status, clinic site, history of stroke, history of CHD, diabetes, hypertension, depression score, and ApoE genotype; consumption of tea at the highest 3 levels was associated with a statistically significant 17-37% reduction in decline in 3MSE scores. Coffee only at the highest level of consumption was associated with significantly decreased decline (20%) in 3MSE. Compared with never drinkers, participants drinking tea 5-10 times/yr, 1-3 times/m, 1-4 times/w, and 5+ times/w had

average annual rates of decline (95% CI) of 3MSE scores that were 0.20 (-0.05-0.46), 0.38(0.16-0.60), 0.43 (0.23-0.64), and 0.31 (0.10-0.51) points lower, respectively. The comparable estimates for coffee drinkers were 0.08 (-0.21-0.38), 0.27(-0.025-0.56), 0.05 (-0.22-0.31), and 0.24 (0.08-0.40), respectively.

Conclusions: These longitudinal analyses show less cognitive decline with increasing consumption of tea beginning at consumption of one cup a month. Coffee was significantly inversely related to cognitive decline only at the highest level of consumption. These patterns suggest that the observed associations are unlikely to be related to caffeine, which is present in coffee at levels 2-3 times higher than in tea. The suggestion of a neuroprotective effect of tea consumption requires further investigation.

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Control #: 10-A-2376-ALZ

O1-06 - Epidemiology: Diet and Intervention

Presentation #: O1-06-03; Speaking Time: 7/11/2010 1:30-1:45 PM

Vitamin D and Cognitive Impairment in NHANES III

David J. Llewellyn¹, Iain A. Lang¹, Kenneth M. Langa², David Melzer¹

¹Peninsula Medical School, University of Exeter, United Kingdom; ²University of Michigan, Ann Arbor, MI.

Contact e-mail: david.llewellyn@pms.ac.uk

Disclosure Block: D.J. Llewellyn, None; I.A. Lang, None; K.M. Langa, None; D. Melzer, None.

Background: Recent European studies suggest vitamin D deficiency is associated with increased odds of cognitive impairment in later life, although findings from the US have been mixed.

Methods: 3,325 adults aged 65 years or more completed cognitive assessments and provided blood samples in the Third National Health and Nutrition Examination Survey (NHANES III), a nationally representative cross-sectional study of the US non-institutionalized population. Cognitive impairment was assessed using measures of immediate and delayed verbal memory, orientation and attention (impairment was defined as the worst 10% of the distribution of combined scores).

Results: Multivariate adjusted odds ratios (95% confidence interval) for cognitive impairment in participants who were 25(OH)D insufficient ($\geq 50 < 75$ nmol/L), deficient ($\geq 25 < 50$ nmol/L), and severely deficient (< 25 nmol/L) in comparison with those sufficient (≥ 75 nmol/L) were 0.9 (0.6-1.3), 1.5 (1.0-2.2), and 4.2 (1.5-12.1) respectively (P for linear trend = 0.02). Log transformed levels of 25(OH)D were also significantly associated with cognitive impairment (P = 0.02).

Conclusions: Vitamin D deficiency is associated with increased odds of cognitive impairment in the US elderly population. Further exploration of the possible causal relationship between vitamin D deficiency and cognitive impairment and dementia is warranted.

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Control #: 10-A-1696-ALZ

O1-01 - Prevention 1 (Presentation #O1-01-06; Speaking Time: 7/11/2010 2:15-2:30 PM)

Walnuts-rich diet improves memory deficits and learning skills in transgenic mouse model of Alzheimer's disease

Abha Chauhan, Mohamed M. M. Essa, Balu Muthaiyah, Ved Chauhan, Kulbir Kaur, Moon Lee
NYS Institute for Basic Research in Developmental Disabilities, Staten Island, NY, USA.
Contact e-mail: abha.chauhan@omr.state.ny.us

Disclosure Block: A. Chauhan, California Walnut Commission, Grants/Research Support; M.M.M. Essa, None; B. Muthaiyah, None; V. Chauhan, None; K. Kaur, None; M. Lee, None.

Background: Transgenic (tg) mice with amyloid precursor protein (APP) gene mutation show amyloid beta-protein (A β) deposition in brain and memory deficit, and serve as an animal model of Alzheimer's disease (AD). Several reports have suggested neurotoxic effects of A β and role of oxidative stress in AD. Walnut is rich in substances such as melatonin, vitamin E, ellagic acid and flavonoids that have anti-oxidant properties. We studied the effect of dietary supplementation of walnuts on the memory, anxiety and learning skills in AD mouse model.

Methods: The mice with double Swedish APP mutation (APP/Tg2576sw) were purchased from Taconic Farm. The experimental groups of APP-transgenic mice from the age of 4 months were fed custom-mix diets (pellets) containing 6% walnuts or 9% walnuts. The control groups, i.e. tg mice and wild-type mice were fed diet without walnuts. The diets for the experimental and control mice were comparable as regards to total calories, and the contents of protein, carbohydrate and fat. These experimental and control mice were examined at the age of 13-14 months and 18-19 months by Morris water maze test (for spatial memory and learning ability), T maze test (for position discrimination learning ability), rota rod test (for psychomotor coordination) and elevated plus maze test (for anxiety-related behavior) to analyze the effect of diet rich in walnuts on learning skills, memory, anxiety, locomotor activity, and motor coordination.

Results: Alzheimer's transgenic mice at the age of 13-14 months and 18-19 months that were fed control diet without walnuts showed memory deficit, anxiety-related behavior, and severe impairment in spatial learning ability, position discrimination learning ability and motor coordination compared to the wild type mice on the same diet. Both the diets rich in 6% or 9% walnuts when fed to tg mice showed a significant improvement in memory, learning ability, anxiety and motor development compared to the AD tg mice on diet without walnuts. The effects of 6% and 9% walnuts diets were similar.

Conclusions: Our results suggest that dietary supplementation of walnuts may have beneficial effect in reducing the risk, delaying the onset or slowing the progression of Alzheimer's disease.

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