with incident memory impairment was not significant but in the same direction. **Conclusions:** Our results confirm that severe vitamin D deficiency is linked with global cognitive impairment and suggest a weaker association with memory decline. Neuroimaging studies are needed to investigate the potential neurodegenerative and cerebrovascular mechanisms.

O2-03-02 VITAMIN D AND THE RISK OF DEVELOPING NEUROIMAGING ABNORMALITIES

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Background: Low vitamin D concentrations have been associated with an increased risk of cognitive decline, all-cause dementia and Alzheimer's disease. Neuroimaging findings could provide an insight into the cerebrovascular and/or neurodegenerative pathologies underlying these associations. We investigated whether low vitamin D concentrations are associated with the risk of developing neuroimaging abnormalities in a population-based prospective cohort of elderly adults. **Methods:** The population consisted of 1,658 participants aged ≥65 years from the US-based Cardiovascular Health Study who were free from prevalent cardiovascular disease, stroke and dementia. Serum 25-hydroxyvitamin D (25(OH)D) concentrations were determined by liquid chromatography-tandem mass spectrometry from blood samples collected at baseline from participants in 1992-93. The first MRI scan was conducted between 1991-1994 and the second MRI scan was conducted between 1997-1999. Change in white matter grade, ventricular grade and presence of infarcts between MRI scan one and two were used to define neuroimaging abnormalities. Logistic regression models were adjusted for age, education, season of vitamin D collection, sex, BMI, smoking, alcohol consumption, depressive symptoms and length of follow-up. **Results:** Participants were followed-up for a mean of 5.0 years (Standard Deviation = 0.6). There were no statistically significant associations between 25(OH)D concentrations and the development of any selected neuroimaging abnormalities. To expand, the multivariate adjusted odds ratios (95% CI) for worsening white matter grade in participants who were severely 25(OH)D deficient (<25 nmol/L) and deficient (≥25-50 nmol/L) were 0.76 (0.35-1.66) and 1.09 (0.76-1.55) compared to participants with sufficient concentrations (≥50 nmol/L). The multivariate adjusted odds ratios for ventricular grade in participants who were severely 25(OH)D deficient and deficient were 0.49 (0.20-1.19) and 1.12 (0.79-1.59) compared to participants with sufficient concentrations. The multivariate adjusted odds ratios for incident infarcts in participants who were severely 25(OH)D deficient and deficient were 1.95 (0.84-4.54) and 0.73 (0.47-1.95) compared to participants with sufficient concentrations. **Conclusions:** There were no significant associations observed between serum vitamin D concentrations and the risk of worsening white matter grade, worsening ventricular grade or incident infarcts. Further studies are necessary to elucidate the potential mechanisms underlying the previously observed relationships between vitamin D concentrations and dementia related disorders.

O2-03-03 HIGH GLYCEMIC DIET ASSOCIATED WITH BRAIN NEURODEGENERATION IN A HEALTHY MIDDLE-AGED COHORT

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Background: Insulin resistance during the preclinical stage of dementia is a risk factor for symptomatic MCI-AD. Diet composition is a major, established determinant of insulin resistance and diabetes, the most important components being a high glycemic diet and low quality carbohydrates, fats and fiber. **Methods:** We investigated the relations of dietary determinants of insulin resistance (glycemic index, fat composition, carbohydrates and fiber) to: 1) cognitive decline using mixed models, 2) total brain and hippocampal/total brain volumes at baseline using magnetic resonance imaging (MRI), and 3) MRI volumetric brain changes over 2 years using linear regression models among a cognitively healthy sample of 489 participants of the Wisconsin Registry for Alzheimer's Prevention study who completed a semi-quantitative food frequency questionnaire. All analyses were adjusted for age, sex, education, energy intake, and *APOE-ε4*. **Results:** The analytic sample was on average 59.8 years of age at baseline (46 to 76 years). Low dietary consumption of simple carbohydrates was associated with slower cognitive decline. For example, rates of decline in verbal learning were slower for participants in the lowest quintile of sugar intake versus higher quintiles (β=0.0267, p=0.03) in adjusted mixed models. High glycemic index was associated with faster decline in working memory (β= -0.0195, p=0.04). High intakes (top 20%) of simple carbohydrates, trans fats, and glycemic load were associated with decreased hippocampal/total brain volumes in 188 participants at baseline (e.g. for glucose, β= -0.427 p=0.03; for trans, β= -0.407 p=0.05; for glycemic load β= -0.3034 p=0.02). Greater atrophy in total brain volume over 2 years was associated with higher glycemic index score (β= 0.002 p=0.06). **Conclusions:** Dietary determinants of insulin resistance, including glycemic index, simple carbohydrates and trans fats, may contribute to neurodegenerative processes of the brain in late middle-age.

O2-03-04 DIETARY NUTRIENT PATTERNS AND BRAIN STRUCTURE IN AN ELDERLY POPULATION

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Background: Mounting evidence have suggested that certain dietary nutrient intakes are associated with reduced risk for Alzheimer's disease and slower cognitive decline among the elderly. However, little is known about the association of dietary nutrient patterns with brain imaging markers such as brain atrophy, surrogate markers for clinical dementia. **Methods:** 674 dementia-free elderly