

(SD=7.5), ranged from 2 to 28. There were no significant changes of HRV and BP compared to non-stimuli. With respect to SPR, the changes showed significant increases with exercise with music ( $p<0.05$ ) and common room/conversation ( $p<0.05$ ). Nine subjects (mean MMSE-J score=15) could respond their level of comfort. There was no significant difference among the six types of stimuli. But they were likely to assess the sound of waves more comfortable than the other stimuli. And the sounds of traffic/ ambulance and common room/conversation were more likely to be assessed as uncomfortable. The results also showed that some stimuli readily drew attention from the subjects. Several characteristics of the response to sounds were indicated, including for sounds that more attract attention, sounds that are more likely to be assessed as comfortable. The quantity and quality of environmental stimuli need to be adjusted to prevent excessive. In addition, nurses need to encourage the persons with dementia to express their own subjective evaluations on auditory stimuli and utilize them for the care.

**P3-309**

**DIFFERENCES IN EDUCATIONAL LEVEL AND ASSOCIATION WITH DEMENTIA PREVALENCE IN TWO CENTENARIAN COHORTS IN ITALY: THE MONZINO 80-PLUS STUDY AND THE CENTENARI A TRIESTE STUDY**

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**Background:** There is epidemiological evidence that educational attainment may reduce the risk of developing dementia. Centenarians are at a high risk of developing dementia. The aim of this study is to compare the association between educational level and dementia prevalence in two cohorts with different degrees of schooling. **Methods:** The Monzino 80-plus Study is a prospective population based study on the epidemiologic characteristics of dementia which recruited all centenarians living in the province of Varese (North-Western Italy) between 2010 and 2011. Subjects were assessed at their place of residence (home or nursing home). All participants, together with their proxy respondents, received a thorough interview and cognitive testing. The Centenari a Trieste (CaT) Study is a population based study of all centenarians residing in the municipality of Trieste (in the North-East of Italy) which begun recruiting in January 2014. Assessment methods are very similar to those used in the Monzino Study. **Results:** In the Monzino 80-plus Study 250 centenarians (92% females, mean age 101 years) were recruited. Mean education (4.5 years, standard deviation: 2.6) was low and only 4% of these centenarians had at least a high school degree. In a multivariable analysis corrected by sex and age, education was not statistically related to dementia ( $p = 0.26$ ). In the CaT Study approximately 150 centenarians will be recruited, and the mean education is expected to be significantly higher (around 10 years), thus increasing the number of subjects in the classes with higher degrees of schooling. **Conclusions:** Although no difference was found between years of formal education and prevalence of dementia in subjects with low education, the number of centenarians with a high degree of education was small in the Monzino study. The addition of the CaT cohort of centenarians can thus provide sufficient power and variability to test the association between education and dementia.

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**VITAMIN D AND INCIDENT MEMORY IMPAIRMENT IN THE LONGITUDINAL AMSTERDAM STUDY OF AGING**

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**Background:** Interest in vitamin D has recently intensified due to associations with extra-skeletal conditions including diabetes, cancer and stroke. Recent meta-analyses confirm that vitamin D deficiency is linked with poorer global cognition and executive function, though the association with memory is currently unclear. As memory decline is a critical feature of Alzheimer's disease, investigating this cognitive domain is a priority. **Methods:** We investigated whether low serum 25-hydroxyvitamin D (25(OH)D) was associated with increased risk of incident memory impairment in the population-based Longitudinal Amsterdam Study of Aging in the Netherlands. 938 white participants aged  $\geq 64$  years and free from memory impairment at baseline provided blood samples in 1995-1996 and were assessed for incident memory impairment (immediate + total recall on Rey's Auditory Verbal Learning Test, Dutch version) over a mean follow-up of 8.4 years. Incident memory impairment was defined as  $\geq 1.5$  SD below mean baseline memory scores at the last available assessment (148 cases). Circulating serum 25(OH)D concentration was measured using a competitive protein-binding assay. Logistic regression models were used to investigate the relationship between vitamin D and incident memory impairment adjusting for season of blood collection, baseline memory score, age, sex, education, body mass index, current smoking status, mean alcohol consumption, physical impairment, depressive symptoms, kidney function and years of follow-up. **Results:** The multivariate adjusted relative risk (95% confidence interval [CI]) of incident memory impairment in participants severely deficient in serum 25(OH)D ( $< 25$  nmol/L;  $n=79$ ) and deficient ( $\geq 25 < 50$  nmol/L;  $n=340$ ) in comparison to sufficient levels ( $\geq 50$  nmol/L;  $n=519$ ) was 1.24 (95% CI, 0.62-2.49;  $n=519$ ) and 0.65 (95% CI 0.40-1.05) respectively ( $p$  for linear trend across groups = 0.77). This corresponds to an unadjusted incidence of memory impairment of 24.7% in severely deficient and 13.2% in deficient participants compared with 14.6% in those with sufficient 25(OH)D. **Conclusions:** We found little evidence to suggest that vitamin D deficiency is associated with incident memory impairment in an elderly white Dutch cohort over a mean of eight years follow-up. This is consistent with the hypothesis that the association between vitamin D deficiency and executive dysfunction may be stronger than that with memory impairment.

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**SUBCLINICAL CARDIAC DYSFUNCTION INCREASES THE RISK OF ALZHEIMER'S DISEASE AND STROKE**

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**Background:** Clinical heart disease, such as coronary heart disease, heart failure, and atrial fibrillation, has often been associated with stroke and Alzheimer's disease (AD). However, the relation of subclinical cardiac dysfunction with stroke and AD is unknown. In a population-based cohort free of clinical heart disease we investigated the association between subclinical cardiac dysfunction and the risk of stroke and dementia, including AD. We were specifically interested in the risk of AD independent from stroke. **Methods:** This study is part of the Rotterdam Study. Using echocardiography, we measured diastolic and systolic parameters of cardiac function at baseline (2002-2005) in 3,277 participants (60.8% female, mean age 71.4 years) free of coronary heart disease, heart failure, atrial fibrillation, stroke, and dementia. These persons were followed up for stroke and dementia until 2012. Cox regression models were adjusted for age, sex, cardiovascular risk factors, MMSE-score and APOE  $\epsilon 4$  carrier status. We repeated the analyses for AD after censoring for incident stroke. **Results:** During 21,691 person-years of follow-up 162 persons suffered a stroke and during 19,385 person-years of follow-up 206 persons developed dementia, of whom 170 AD. For stroke, we found associations with