Title Smoking behavior, sleep quality, and physical activity level are associated with cerebral amyloid pathology in non-demented persons: the Amyloid Biomarker Study.

Authors
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Background The relationship between lifestyle factors and Alzheimer's disease pathophysiology is not well understood. The aim of this study was to assess the cross-sectional association between lifestyle factors and amyloid abnormality in individuals with normal cognition (NC) and mild cognitive impairment (MCI).
Methods We selected 39 cohorts from the Amyloid Biomarker Study. Self-reported lifestyle data were available for 8924 participants with NC and 2403 participants with MCI. Amyloid abnormality was determined with amyloid-PET (center-specific cutoffs) or with aß42 level in CSF (data-driven or center-specific cutoffs). Lifestyle data was harmonized across cohorts and dichotomized into ever smoked yes/no, current alcohol consumption yes/no, currently physically active yes/no and current sleep problems yes/no. Education was dichotomized into 'high' or 'low' at the median of 16 years. Generalized estimating equations with amyloid abnormality as outcome and single lifestyle factors as predictors were used. Interactions with age, sex, education, cognitive status and *APOE*-e4 carrier status were assessed and these variables were added as covariates to all models.
Results Thirty-one percent of participants were amyloid positive, 37% were *ApoE*-4 carrier, and 55% were female. The mean age was 68.7 (SD8.7). Twenty-five percent of participants smoked, 54% consumed alcohol, 30% experienced sleep problems and 25% were physically inactive. Overall, smoking was associated with a slightly increased prevalence of amyloid abnormality (2%; p=0.03). In NC, sleep problems were unrelated to the prevalence of amyloid abnormality while in MCI, sleep problems were associated with a lower prevalence (15.3%; p<0.001). Physical activity was related to higher prevalence of amyloid abnormality in *APOE*-e4 carriers (5.9%; p<0.001) while this association was not found in noncarriers. Age, sex and educational level did not modify the identified associations between lifestyle factors and amyloid abnormality. Alcohol consumption was unrelated to amyloid abnormality.
Conclusion Smoking behavior, sleep quality, and physical activity were associated with amyloid abnormality depending on cognitive and *APOE*-e4 status. A better understanding of the associations between lifestyle factors and cerebral amyloid pathology in different subgroups will aid in identifying those at risk and contribute to the development of targeted intervention strategies.