

Key Findings

Sleep disturbances in early midlife are associated with unfavorable levels of key AD biomarkers 20 years later

Poor Sleep Characteristics in Midlife and Alzheimer Disease Biomarkers

Clémence Cavailles^a, Mercedes R. Carnethon^b, Kristen L. Knutson^b, Stephen Justin Thomas^c, Kristine Yaffe^a

^aUniversity of California San Francisco, San Francisco, CA, USA; ^bNorthwestern University Feinberg School of Medicine, Chicago, IL, USA; ^cUniversity of Alabama at Birmingham, Birmingham, AL, USA

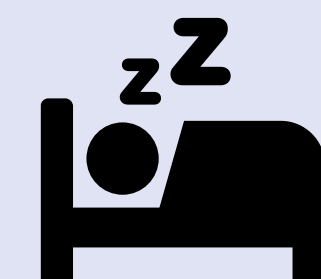
BACKGROUND

Growing evidence suggests an association between sleep and Alzheimer's disease (AD) among older adults. However, the relationships between sleep patterns and AD biomarkers **earlier in life** remain underexplored.

Aim: to determine how **sleep in early midlife** relates to four plasma- and MRI-derived **AD biomarkers** in late midlife.

METHODS

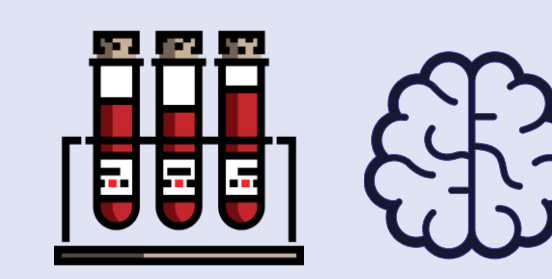
Population-based cohort, 1,325 participants from the **Coronary Artery Risk Development in Young Adults (CARDIA)** study.



Self-reported sleep
(2000)



Mean follow-up duration: 20.0 (±0.5)



Blood test & brain MRI
(2020)

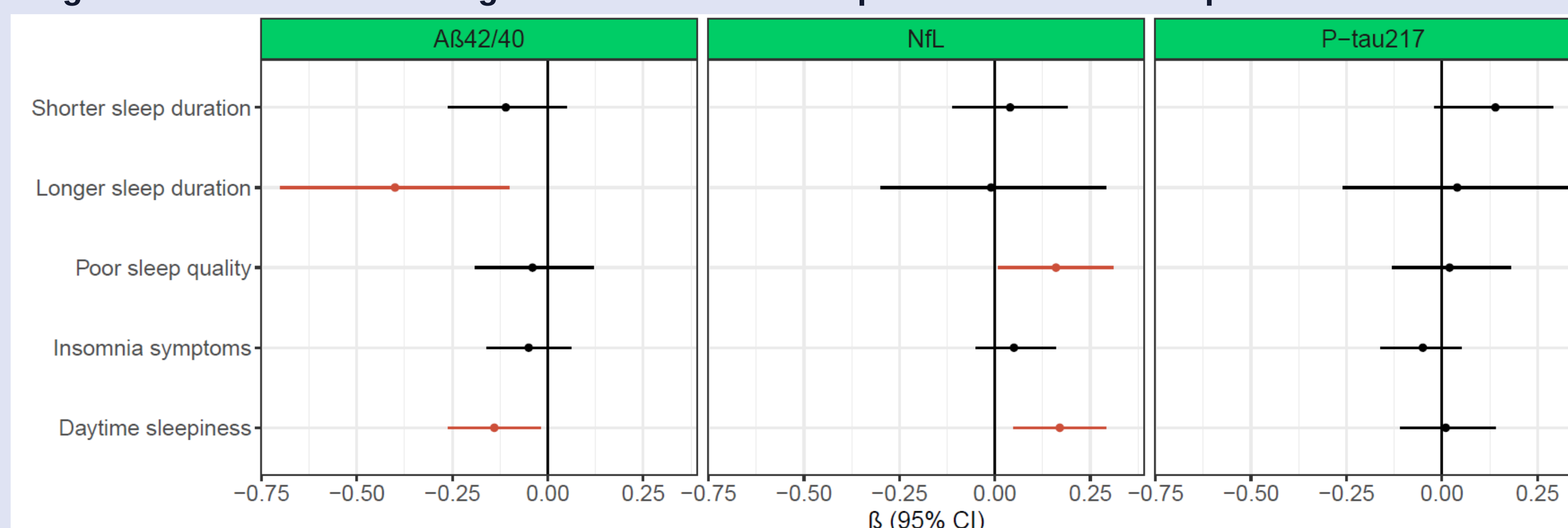
Plasma A β 42/40 and p-tau217 were assayed with the Fujirebio Lumipulse G1200, and NfL with the Quanterix Simoa HD-X.

Spatial Pattern of Abnormality for Recognition of Early AD (**SPARE-AD**) was MRI-derived & measured AD-like brain atrophy.

RESULTS

At baseline, the participants' mean age was 40.3 (±3.5) years, 57% were women, and 43% were Black. Around 15% of participants reported a **shorter sleep duration** (<6 hours), 3% **longer sleep duration** (≥9 hours), 14% **poor sleep quality**, 54% at least **one insomnia symptom**, and 26% **daytime sleepiness**.

Fig 1. Multivariable linear regressions between sleep characteristics and plasma AD biomarkers.



Reminder: lower A β 42/40 and higher p-tau217 and NfL levels are indicative of a higher AD risk.

- Longer sleep duration was associated with lower A β 42/40 (**Fig 1**).
- Poor sleep quality was associated with higher plasma NfL level.
- Daytime sleepiness was associated with both A β 42/40 and NfL levels.
- Results remained consistent after further adjustment for behaviors, comorbidities, and APOE4 status.

- Participants with insomnia symptoms had higher SPARE-AD atrophy patterns.
- This corresponds to about 8% greater burden of AD-like brain atrophy (**Fig 2**).

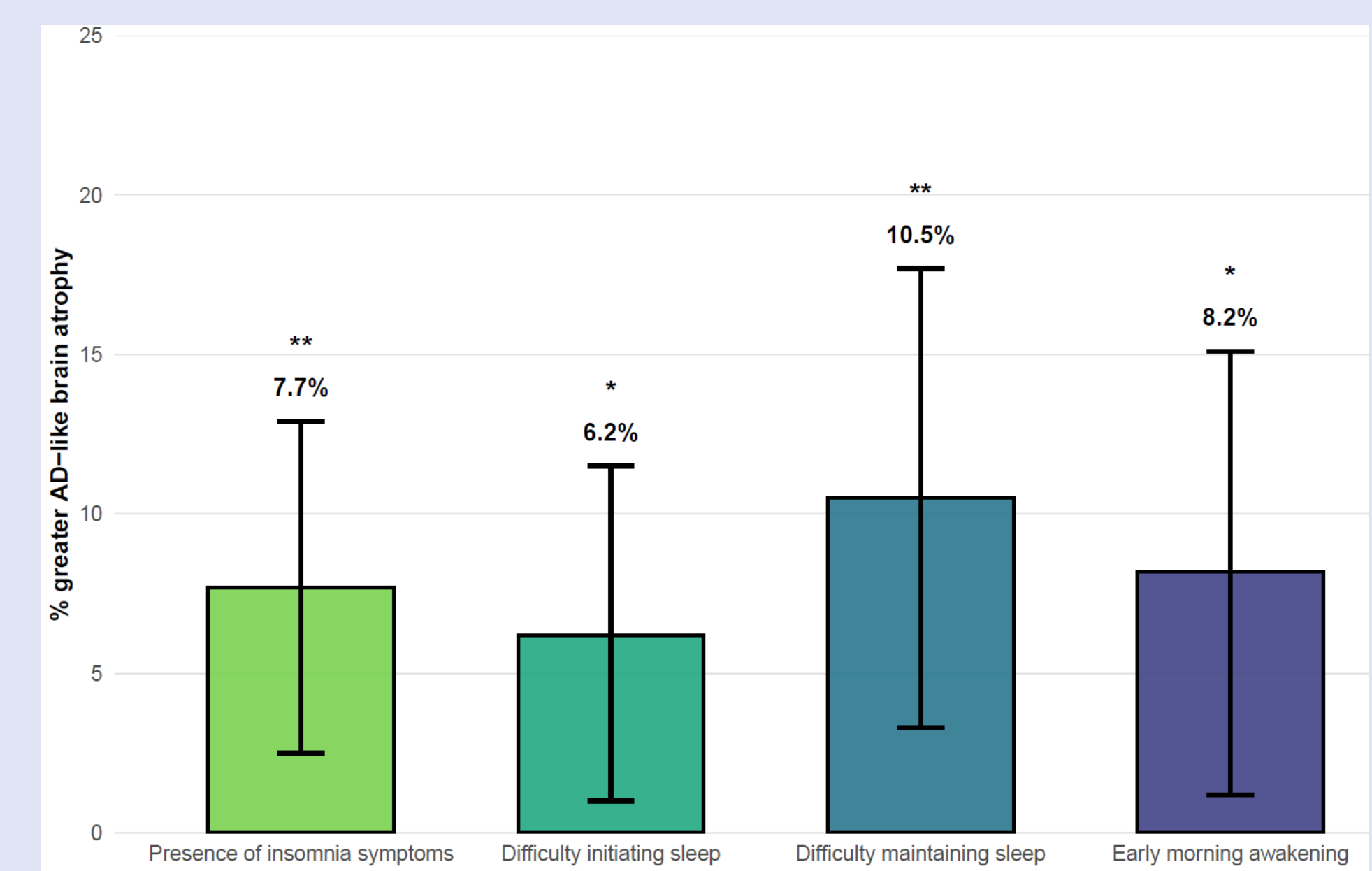


Fig 2. Adjusted percentage difference in SPARE-AD by insomnia symptoms

Models were adjusted for age, sex, race/ethnicity, education, and study center.



@clem_cavailles



clemence.cavailles@inserm.fr



This study supports prior evidence suggesting sleep disturbances as potential modifiable risk factor for AD



A β , β -amyloid; NfL, neurofilament light chain; p-tau, phosphorylated tau