

Sleep Quality, Cognition and Aging

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ABSTRACT

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Sleep is essential for an efficient cognitive functioning. Recent evidence also suggest that poor sleep quality may increase the risk of cognitive decline and Alzheimer's disease (AD), notably by exacerbating amyloid deposition.

But, sleep quality may also have an impact on brain structure and function.

We first investigated, in a group of cognitively normal older adults, the impact of subjective sleep quality on brain integrity and cognitive performance, focusing on executive functioning and episodic memory (Branger et al., 2016). Sleep quality was assessed using a questionnaire covering the last five years. We showed that older adults complaining of recurring difficulties falling asleep have greater amyloid burden in prefrontal areas, known to be early affected in AD. Furthermore, fragmented sleep was also associated with lower grey matter volume of the insula. Surprisingly, subjective sleep quality was not associated with cognitive performance nor brain metabolism. In a second study,

we analyzed actigraphy data collected during one week and focused on indices of sleep fragmentation (mean intensity and night-to-night variability). In cognitively unimpaired elderly participants, we showed that the intensity of sleep fragmentation mediated the association between fronto-hippocampal hypometabolism and lower executive functioning. Moreover, a high night-to-night variability in sleep fragmentation was related to thalamic atrophy and, to a lesser extent, to amyloid burden in prefrontal areas. However, in patients with subjective cognitive decline and/or mild cognitive impairment, sleep fragmentation no longer contributed to the expression of cognitive deficits. These findings suggest that sleep fragmentation may directly contribute to lower cognitive performance in cognitively unimpaired elderly subjects. In addition, treating sleep disturbances before the onset of cognitive deficits may help to cope with brain alterations and maintain cognitive functioning (André et al., 2019).

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