

Publication

Age-related changes in the circadian modulation of sleep-spindle frequency during nap sleep.

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Sleep spindles exhibit a clear circadian modulation in healthy younger people. During the biological night (when melatonin is secreted), spindle density and spindle amplitude are high and spindle frequency and its variability are low, as compared with the biological day. We investigated whether this circadian modulation of spindle characteristics changes with age.; A 40-hour multiple-nap paradigm under constant-routine conditions; Chronobiology Laboratory, University Psychiatric Hospitals, Basel, Switzerland; Seventeen younger (20-31 years) and 15 older (57-74 years) volunteers.; N/A.; Whereas the circadian modulation of spindle density, amplitude, duration, and intraspindle frequency variability was not greatly affected by age, we found significant changes in the circadian modulation of spindle frequency. The pronounced circadian modulation of spindle frequency in younger, but not older, subjects was phase locked with the circadian rhythm in melatonin secretion. In the latter, circadian modulation was attenuated and tended to be advanced with respect to the timing of melatonin secretion. There was no difference between age groups in the phase of the sleep-wake cycle or that of melatonin, nor did the phase angle between them differ. Although changes in the circadian modulation of spindle frequency in older subjects were accompanied by reduced amplitude in the sleep consolidation profile, there was no significant correlation between spindle frequency and sleep consolidation.; This multiple-nap protocol under constant-routine conditions revealed an age-dependent weaker coupling of the circadian rhythms of spindle frequency and sleep propensity to the circadian rhythm of melatonin secretion.

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