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Sleep in Alzheimer's disease: a systematic review and meta-analysis of polysomnographic findings

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Abstract

Polysomnography (PSG) studies of sleep changes in Alzheimer's disease (AD) have reported but not fully established the relationship between sleep disturbances and AD. To better detail this relationship, we conducted a systematic review and meta-analysis of reported PSG differences between AD patients and healthy controls. An electronic literature search was conducted in EMBASE, MEDLINE, All EBM databases, CINAHL, and PsycINFO inception to Mar 2021. Twenty-eight studies were identified for systematic review, 24 of which were used for meta-analysis. Meta-analyses revealed significant reductions in total sleep time, sleep efficiency, and percentage of slow-wave sleep (SWS) and rapid eye movement (REM) sleep, and increases in sleep latency, wake time after sleep onset, number of awakenings, and REM latency in AD compared to controls. Importantly, both decreased SWS and REM were significantly associated with the severity of cognitive impairment in AD patients. Alterations in electroencephalogram (EEG) frequency components and sleep spindles were also observed in AD, although the supporting evidence for these changes was limited. Sleep in AD is compromised with increased measures of wake and decreased TST, SWS, and REM sleep relative to controls. AD-related reductions in SWS and REM sleep correlate with the degree of cognitive impairment. Alterations in sleep EEG frequency components such as sleep spindles may be possible biomarkers with relevance for diagnosing AD although their sensitivity and specificity remain to be clearly delineated. AD-related sleep changes are potential targets for early therapeutic intervention aimed at improving sleep and slowing cognitive decline.

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Figures