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Pharmacological and non-pharmacological interventions to enhance sleep in mild cognitive impairment and mild Alzheimer's disease: A systematic review

Jonathan Blackman^{1, 2}, Marta Swirski¹, James Clynes³, Sam Harding¹, Yue Leng⁴, Elizabeth Coulthard²

Affiliations

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Abstract

Suboptimal sleep causes cognitive decline and probably accelerates Alzheimer's Disease (AD) progression. Several sleep interventions have been tested in established AD dementia cases. However early intervention is needed in the course of AD at Mild Cognitive Impairment (MCI) or mild dementia stages to help prevent decline and maintain good quality of life. This systematic review aims to summarize evidence on sleep interventions in MCI and mild AD dementia. Seven databases were systematically searched for interventional studies where $\geq 75\%$ of participants met diagnostic criteria for MCI/mild AD dementia, with a control group and validated sleep outcome measures. Studies with a majority of participants diagnosed with Moderate to Severe AD were excluded. After removal of duplicates, 22,133 references were returned in two separate searches (August 2019 and September 2020). 325 full papers were reviewed with 18 retained. Included papers reported 16 separate studies, total sample ($n = 1,056$), mean age 73.5 years. 13 interventions were represented: Cognitive Behavioural Therapy - Insomnia (CBT-I), A Multi-Component Group Based Therapy, A Structured Limbs Exercise Programme, Aromatherapy, Phase Locked Loop Acoustic Stimulation, Transcranial Stimulation, Suvorexant, Melatonin, Donepezil, Galantamine, Rivastigmine, Tetrahydroaminoacridine and Continuous Positive Airway Pressure (CPAP). Psychotherapeutic approaches utilising adapted CBT-I and a Structured Limbs Exercise Programme each achieved statistically significant improvements in the Pittsburgh Sleep Quality Index with one study reporting co-existent improved actigraphy variables. Suvorexant significantly increased Total Sleep Time and Sleep Efficiency whilst reducing Wake After Sleep Onset time. Transcranial Stimulation enhanced cortical slow oscillations and spindle power during daytime naps. Melatonin significantly reduced sleep latency in two small studies and sleep to wakefulness transitions in a small sample. CPAP demonstrated efficacy in participants with Obstructive Sleep Apnoea. Evidence to support other interventions was limited. Whilst new evidence is emerging, there remains a paucity of evidence for sleep interventions in MCI and mild AD highlighting a pressing need for high quality experimental studies exploring alternative sleep interventions.

Keywords: AD; Alzheimer's dementia; Alzheimer's disease; MCI; mild cognitive impairment; sleep.

Figures



Figure 1 Theoretical interventional strategies to enhance...



Figure 2 PRISMA flowchart

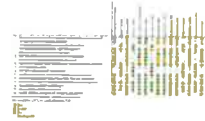


Figure 3 Quality appraisal using Joanna Briggs...

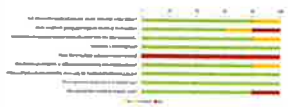


Figure 4 Overall quality appraisal by Joanna...

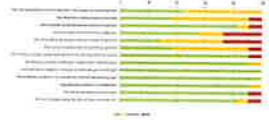


Figure 5 Overall quality appraisal by Joanna...

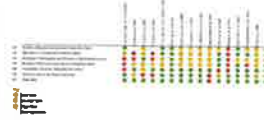


Figure 6 Cochrane collaboration tool for assessing...

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