Psychosocial Interventions for Sleep Disturbances in Persons with Alzheimer's Disease

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Conflict of Interest

- None to disclose

Persons with Alzheimer's disease exhibit more pronounced changes in sleep as compared to age-matched controls

- Fragmented sleep (many awakenings)
- ↓ Slow Wave Sleep
- ↓ Rapid Eye Movement (REM) sleep
- ↓ Sleep efficiency
- ↑ Sleep onset latency
- Stage 1, 2 during naps

Sleep in normal aging versus sleep in persons with Alzheimer's disease

Normal aging

- Prevalence of Insomnia:
  - 26% - 44%
- Prevalence of Obstructive Sleep Apnea:
  - 56 – 76%
- Prevalence of Restless Legs Syndrome:
  - 10-28%

Alzheimer's disease

- Prevalence of Insomnia:
  - 30-50%
- Prevalence of Obstructive Sleep Apnea:
  - 70 – 80%
- Prevalence of Restless Legs Syndrome:
  - 19-45%

Why is sleep so disrupted in Alzheimer's disease?

- Normal changes associated with aging
- Degradation of the superchiasmatic nucleus
  - the "pacemaker" for sleep
- Other sleep problems and psychiatric conditions
  - Depression, anxiety, apathy
- Poor sleep hygiene
- Combination of the above

Interventions to Reduce Sleep Disturbances in Dementia

- Sleep hygiene
- Social activities
- Exercise
- Bright Light
- Melatonin
- Continuous Positive Airway Pressure
- Combined interventions

Sleep Hygiene

- McCurry SM, Gibbons LE, Logsdon RG et al. Training caregivers to change the sleep hygiene practices of patients with dementia: The NITE-AD Project. (2003). J Am Geriatr Soc;**10**: 1455–1460.

- **Major outcome**: Family caregivers are easily taught simple methods to ensure sleep hygiene.

Social Activities

- Kolanowski, A., Litaker, M., and Buettner, L. (2005). Efficacy of theory-based activities for behavioral symptoms of dementia. *Nursing Research*, 54 (4), 219-228
- Richards, K.C., Beck, C., O'Sullivan, P. & Shue, V.M. (2005). Effect of individualized social activity on sleep in nursing home residents with dementia. *Journal of the American Geriatrics Society, 53(9),* 1510-1517.
- Connell, Sanford, & Lewis (2007). Therapeutic Effects of an Outdoor Activity Program on Nursing Home Residents with Dementia. J. of Housing for the elderly, 21(3), 194-209.

- **Major outcomes**: Social activities that are tailored to persons' interests and function can be implemented; decreases in daytime sleep were found; persons with low sleep efficiency (<50%) benefited the most.

Exercise

- Teri L, Gibbons LE, McCurry SM, et al. (2003). Exercise plus behavioral management in patients with Alzheimer Disease. JAMA. 2003;290(15):2015-2022.
- McCurry SM, Gibbons LE, Logsdon RG, et al. Nighttime insomnia treatment and education for Alzheimer's disease. J Am Geriatr Soc. 2005;53(5):793-802.
- Yamakawa et al. (2008). Environmental control intervention for frontotemporal dementia with reversed sleep-wake cycles. Amer. J of AD and Dementias, 23(5), 470-476.
- **Major outcomes**: Exercise programs can be effectively implemented in persons with AD; Walking >3 times/week in addition to behavioral management and bright light can improve sleep in persons with dementia; not true in case study in person with FTD (closing room doors worked better than walking with person).

Exposure to Bright Light

- Ancoli-Israel,S., Martin,J.L., Kripke,D.F., Marler,M., and Klauber,M.R. (2002). Effect of light treatment on sleep and circadian rhythms in demented nursing home patients. *JAGS*, 50:282-289.

- Dowling, G. A., Graf, C., Hubbard, E., & Luxenberg, J. (2007). Light treatment for neuropsychiatric behavior in Alzheimer's disease. *Western Journal of Nursing Research*, 29(8), 961-975.

- Sloan et al. (2007). High-Intensity Environmental Light in Dementia: Effect on Sleep and Activity. JAGS, 55(10), 1524-1533.

- **Major outcomes**: Both morning and whole day bright light have shown improvements in sleep onset latency and in stabilizing wake-sleep rhythms.

Melatonin

- Dowling, G. A., Burr, R. L., Van Someren, E. J. W., Hubbard, E. M., Luxenberg, J. S., Mastick, J., & Cooper, B. A. (2008). Melatonin and bright light treatment for rest-activity disruption in institutionalized patients with Alzheimer's disease. *Journal of the American Geriatric Society*, 56, 239-246.

- Rixt F. Riemersma-van der Lek, MD; Dick F. Swaab, MD, PhD; Jos Twisk, PhD; Elly M. Hol, PhD; Witte J. G. Hoogendijk, MD, PhD; Eus J. W. Van Someren, PhD (2008). Effect of Bright Light and Melatonin on Cognitive and Noncognitive Function in Elderly Residents of Group Care Facilities. *JAMA*. 2008;299(22):2642-2655.

- Gehrman et al. (2009). Melatonin Fails to Improve Sleep or Agitation in Double-Blind Randomized Placebo-Controlled Trial of Institutionalized Patients With Alzheimer Disease. Amer. J. Geriatric Psychiatry, 17(2), 166-169.

- **Major outcomes**: Melatonin alone does not seem to improve sleep; bright light therapy combined with melatonin has been shown to improve several sleep parameters.

Continuous Positive Airway Pressure

- Sonia Ancoli-Israel, Barton W. Palmer, Jana R. Cooke, Jody Corey-Bloom, Lavinia Fiorentino, Loki Natarajan, Lianqi Liu, Liat Ayalon, Feng He, Jose S. Loredo (2008). Cognitive Effects of Treating Obstructive Sleep Apnea in Alzheimer's Disease: A Randomized Controlled Study. *JAGS*, 56(11), 2076-2081.

- **Major outcomes**: Persons with AD can successfully implement CPAP at home with assistance from caregiver for 6 weeks; total sleep time improved.

Combined Interventions

- McCurry SM. Gibbons LE. Logsdon RG. Vitiello MV. Teri L. Nighttime insomnia treatment and education for Alzheimer's disease: a randomized, controlled trial. (2005). *Journal of the American Geriatrics Society*. 53(5):793-802.
- Naylor E, Penev PD, Orbet L, et al. Daily social and physical activity increases slow-wave sleep and daytime neuropsychological performance in the elderly. Sleep. 2000;23:87–95.
- Alessi CA, Martin JL, Webber AD, et al. Randomized, controlled trial of a nonpharmacological intervention to improve abnormal sleep/wake patterns in nursing home residents. J Am Geriatr Soc. 2005;53:803–810.
- Martin JL, Marler JR, Harker JO, et al. A multicomponent nonpharmacological intervention improves activity rhythms among nursing home residents with disrupted sleep/wake patterns. J Gerontol A Biol Sci Med Sci. 2007;62:67–72.
- Ouslander JG, Connell BR, Bliwise D, et al. A nonpharmacological intervention to improve sleep in nursing home patients: results of a controlled clinical trial. J Am Geriatr Soc. 2006;54:38
- **Major outcomes**: Sleep may improve with multi-component interventions including exercise, behavioral management, bright light, reduction of nighttime noise; results are not always reproducable.

Interventions to improve sleep are still needed in persons with dementia

- Other complementary and alternative products and practices require rigorous trials
  - Massage
  - Music
  - Cranial electrical stimulation
  - Yoga
  - Tai chi
  - Meditation

Barriers to Successful Interventions

- Buy-in from caregiver
  - Caregiver health status
  - Caregiver employment status
- Changing routines
  - In home and in institutions
- Co-morbidities
  - Psychiatric; physical

Gaps in Literature

- Stages of dementia: Mild Cognitive Impairment – Advanced stages
- Measurement issues: In-home PSG
- Dose effect: Bright light; exercise; melatonin
- Synergistic effects on caregiver health

Thank you

- Questions?