SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The objective of this study was to test the effectiveness of morning bright light therapy in reducing rest–activity disruptions among institutionalized patients with severe AD. Examples of rest–activity disruptions include: insomnia, frequent nighttime awakenings, wandering at night, unusually early morning awakenings, sundowning, and excessive daytime sleepiness.

Effect of Morning Bright Light Treatment for Rest-Activity Disruption in Institutionalized Patients With Severe Alzheimer's Disease

Dowling, G. A., Hubbard, E. M., Mastick, J., Luxenberg, J. S., Burr, R. L., Van Someren, E. J. W.

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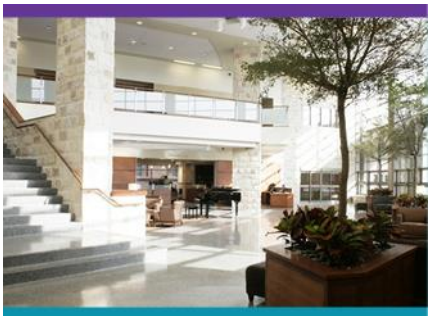
Key Concepts/Context

Studies suggest that exposure to light of adequate intensity and duration at the proper time of day can be associated with a positive improvement in the quality and duration of sleep. Since institutional environments tend to have very low light levels, residents may not be exposed to enough bright light to entrain the circadian clock to the 24-hour day. In particular, bright light treatment has been shown to improve sleep–wake cycle disturbances in some Alzheimer's disease (AD) subjects.

Methods

This randomized, placebo-controlled, clinical trial included 46 subjects (mean age 84 years) meeting the National Institute of Neurological and Communicative Disorders and Stroke–the Alzheimer's Disease and Related Disorders Association diagnostic criteria. They were recruited from two large, skilled nursing facilities in San Francisco, CA.

The experimental group received 1 hour (9:30 a.m. – 10:30 a.m.) of bright light exposure (≥ 2,500 lux in gaze direction) from Monday to Friday for 10 weeks. The control group received usual indoor light (150–200 lux). Nighttime sleep efficiency, nighttime sleep time and wake time, and nighttime number of awakenings and daytime wake time were assessed using actigraphy. Circadian rhythm parameters were also assessed from the actigraphic data using cosinor analysis and nonparametric techniques. Repeated measures analysis of variance (ANOVA) was used to test study hypotheses.



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Findings

Morning bright light exposure did not result in an overall improvement in measures of sleep or the rest-activity rhythm in all experimental subjects when compared to control subjects. However, subjects with the most impaired rest–activity rhythm responded significantly and positively to a brief (1 hour) light intervention.

The subjects in this study had fairly severe AD with an overall average Mini-Mental State Examination (MMSE) score of 6.7 (*SD* = 6.8, median = 5, range 0–23) and a mean age of 84 years (median = 88, range 60–98). Their rest–activity rhythms were severely disrupted, as reflected by low values for *R2* (mean = 0.12) and stability (mean IS=0.4), high variability (mean IV=1.2), and low relative rhythm amplitude (RA = 0.56).

Bright light can be a promising and practical intervention to reduce rest-activity disruptions among institutionalized patients with severe AD. Further studies are needed to assess whether longer duration of light exposure can produce significant improvements in sleep and the rest-activity rhythm.

Limitations

No specific limitations were mentioned in the study.

Design Implications

Bright light therapy may be a promising and practical intervention to reduce rest-activity disruptions among institutionalized patients with severe AD. In addition to adding an artificial light fixture that provides bright light, designers may consider various design attributes that may increase AD patients' exposure to bright morning natural light. Those may include maximizing the size of outside windows or the opening facing east to bring more bright morning light in.