SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The purpose of this study was to test the effect of timed morning or afternoon bright light exposure compared with usual indoor light levels on the presence, frequency, severity, and occupational disruptiveness of neuropsychiatric behaviors in nursing home residents with AD.

Light Treatment for Neuropsychiatric Behaviors in Alzheimer's Disease

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Key Concepts/Context

Neuropsychiatric behaviors are common in people with Alzheimer's disease (AD) and make both professional and lay caregiving difficult. Light therapy has been somewhat successful in ameliorating disruptive behaviors.

Methods

This study was a randomized clinical trial designed to compare two experimental groups that received morning or afternoon bright light exposure to a control group that was exposed only to usual indoor light levels. Participants were randomly assigned to one of two experimental groups: one that received morning light (n = 29), one that received afternoon light (n = 24), or to the control group (n = 17). Light was administered for one hour daily (Monday-Friday) for 10 weeks. The Neuropsychiatric Inventory–Nursing Home was used to assess behavior at baseline and at the end of the intervention. Outcome measures were obtained at the end of a baseline week and at the end of the intervention (11 weeks).

The control group received usual indoor light (150-200 lux) and participated in their regularly scheduled activities in the usual location. Participants in the experimental conditions received either morning (9:30-10:30 a.m.) or afternoon (3:30-4:30 p.m.) bright light exposure (>2,500 lux in gaze direction) Monday through Friday for 10 weeks. During this time, participants in the experimental groups (three to eight patients together) participated in activities in a brightly lit area, either outdoors or in an indoor space with windows to let in ample natural light.

Sample

Residents of two large long-term care facilities in San Francisco, California who experienced rest-activity disruption and were diagnosed with AD were identified by nursing and medical staff. Rest-activity disruptions included insomnia, frequent

nighttime awakenings, wandering at night, unusually early morning awakenings, sun downing, and excessive daytime sleepiness.

Setting

Metrics and Measurement

The Neuropsychiatric Inventory–Nursing Home version (NPI-NH) is a commonly used instrument that consists of a structured interview format used to measure the presence, frequency, and severity of both behavioral and psychiatric symptoms commonly exhibited in patients with dementia. Caregivers completed the interviews.

In addition, caregivers rate the amount of distress or work time and effort they incur when caring for a patient exhibiting a particular behavior. These ratings are used to generate an occupational disruptiveness score that ranges from 0 (*no distress*) to 5 (*very severe distress*) for each item. Individual item occupational disruptiveness scores are added to yield a total occupational disruptiveness score, and all domain scores are added to yield a total score (Iverson et al., 2002).

Findings

Analyses revealed statistically significant differences between groups on agitation/aggression, depression/dysphoria, aberrant motor behavior, and appetite/eating disorders. The magnitude of change was small and may not represent clinically significant findings. Agitation/aggression and nighttime behaviors commonly occurred and were highly correlated with occupational disruptiveness. Interventions that decrease the presence and/or severity of neuropsychiatric behaviors have the potential to significantly decrease caregiver burden.

Design Implications

Results from the larger study (reported elsewhere) demonstrated that one hour of bright light administered either in the morning or in the afternoon facilitated entrainment of the rest-activity rhythm to the 24-hour day (Dowling, Mastick, Hubbard, Luxenberg, & Burr, 2005). This effect of light either did not affect neuropsychiatric behaviors or was not detected by the NPI-NH. The ability of light to entrain the rest-activity rhythm is potentially clinically significant because it should be easier for caregivers to provide care to patients with socially acceptable day-night rhythms.

Limitations

The authors noted that despite our attempts to gather accurate data, it is possible that our CNAs' assessments differ from assessments that might have resulted if

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research staff or staff with more advanced professional training had been queried. It was also noted that staff commented informally and scored behaviors as nondisruptive, noting that it was "part of their job" to attend to such behavior; therefore, some behavior scores may not be accurate.

The authors also noted that some behaviors are more amenable to observation (e.g., agitation/aggression, nighttime behavior), and others are less so (e.g., apathy/indifference). Our data may more accurately reflect the presence of those easily observable behaviors and less accurately reflect those less easily observed. As well, it was not feasible for staff to be unaware of the participants' experimental condition, and this may have biased ratings on the NPI-NH.

Given the waxing and waning of many neuropsychiatric symptoms, it is possible that behaviors occurring at a specific data collection time point did not reflect a broader behavioral profile for a given participant over a more extended period of time. For example, light may have had an impact on behaviors during the first week of the intervention, but that effect may have no longer been present at the end of the intervention.