



KEY POINT SUMMARY

OBJECTIVES

The purpose of this study was to evaluate the relationship between postoperative delirium and bright light therapy.

Influence of Bright Light Therapy on Postoperative Patients: A Pilot Study

Taguchi, T., Yano, M. & Kido, Y. 2007 | *Intensive and Critical Care Nursing Volume 23, Pages 289-297*

Key Concepts/Context

While the use of light therapy in healthcare settings has been shown to be effective for the adjustment of the sleep-awake rhythm, it has not been applied to postoperative patients. Light is expected to be useful for the postoperative adjustment of the circadian rhythm by increasing the level of awakening during the daytime and inducing sleep during the night-time in patients under postoperative management in the ICU after major anaesthesia and surgery. It is hypothesized that the use of bright light might decrease the presence of postoperative delirium.

Methods

Research Methodology

This study had an experimental intervention design.

Sample

The subjects of this study were 11 patients, of whom six were given bright light therapy (study group) and five were not (control group).

Setting

The subjects were patients who were operated on for oesophageal (the part of the alimentary canal which connects the throat to the stomach) cancer.

Metrics and Measurement

This study attempted to advance the internal clock and adjust the circadian rhythm by manipulating light, a synchronising factor. For this purpose, light at 5000 lx was applied for two hours in the morning, following the basic formula for the treatment of sleep disorders. Since this intervention was performed immediately after surgery, subjective evaluation of sleep by the sedated subjects was considered to be difficult. Therefore, the circadian rhythm was evaluated by analyzing tendencies of the



sleep-awake rhythm on the basis of the daytime and nighttime activity rhythms and parameters of sympathetic and parasympathetic activities.

The light source comprised three-wavelength fluorescent lamps. Bright light therapy was started on the day after extubation. The subjects were exposed to light for two hours from 7:30 to 9:30 in the morning from days 2 to 5 after surgery, in principle, with modifications according to the condition of each patient. In the six patients, bright light therapy was started at 3.1 ± 1.4 days after surgery and was performed over a mean of 2.8 ± 0.9 days for 110 ± 14 min each day. The intensity of illumination was maintained at about 5000 lx immediately before the eyes. The time until extubation was 2.1 ± 1.4 days in the study group and 1.2 ± 0.4 days in the control group, with a delay of about one day in the study group. The intensity of illumination was gradually increased from the level of the ceiling light over about 15-20 min from the beginning of bright light therapy to allow the patients to become accustomed to the light.

Confounding Variables

None were identified.

Data Analysis

The circadian rhythm and the results of delirium assessment were compared between the two groups and according to time after surgery within each group, using Friedman's test, Mann-Whitney's test, and Fisher's exact probability test. These analyses were performed using the statistical software SPSS, Version 11.

Findings

In this study a significant difference was observed in the incidence of delirium in the morning on day 3 after the beginning of bright light therapy, suggesting an effect of light. The effect of light on the sympathetic nervous system is reported to increase from immediately after the beginning of exposure to light, reach a plateau after about 20 min, and persist for some time thereafter (Saito et al., 1996). In this study this physiologic effect of light may have increased as the exposure was repeated, although this speculation has no supporting evidence, because changes in the melatonin level were not examined. However, the results did not establish the effectiveness of bright light therapy for the normalisation of the circadian rhythm, which was the objective of this study.

Design Implications

Under these circumstances nurses have an important role to play in environmental adjustments. The natural light environment, which Nightingale attached importance to, is likely to help patients restore their innate circadian rhythm and promote their recovery. Therefore, by supplementing daytime light exposure, which tends to be



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insufficient in the ICU, by artificial illumination, patients may be able to live in a light environment similar to the natural daytime light environment of their normal daily activities. Such use of light may be equivalent to the environmental theory once proposed by Nightingale.

Limitations

In this study, delirium was diagnosed and evaluated according to the NEECHAM Confusion Scale on the basis of information from nurses, but this evaluation could have investigator bias, and there were limitations in capturing serial changes in the symptoms of delirium.