

“Light Modulation Therapy” for Bipolar Disorder

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Bright light therapy, a non-pharmacotherapy, is well-known and has been used for treating not only seasonal affective disorder but also non-seasonal depression, bipolar depression, chronic depressive disorder, ante and postpartum depression, late luteal phase dysphoric disorder, circadian phase sleep disorder, jet lag, shift work problems, and behavioral disturbance and insomnia in organic dementia [1]. Various mechanisms for the action of bright light therapy have been proposed including extension of the photoperiod, suppression of melatonin secretion, advancement of circadian rhythm, and interactions with serotonin to name a few [1]. The antidepressant effect of dawn simulation as well as bright light therapy has been confirmed by meta-analysis [2]. As such, it can be hypothesized that light exposure, whether it is dim or bright, may bring about an antidepressant effect. In line with this hypothesis, findings from our research group have shown that environmental light was directly associated with mood [3] and that total annual sunshine was inversely associated with suicide rate [4].

Conversely, light deprivation (i.e., dark therapy) may be effective for mania. Barbini et al. [5] exposed 16 bipolar inpatients with a manic episode to a regimen of 14 hours of enforced darkness from 6 PM to 8 AM each night for three consecutive days. As a result, dark therapy resulted in a significantly faster decrease of manic symptoms. More recently, virtual darkness therapy (blue light-blocking treatment by means of orange-tinted glasses) has been proposed as a promising new treatment option for mania [6]. The theoretical basis for this method may lie in the recently identified blue light-sensitive retinal photoreceptor, which is solely responsible for the circadian master clock. Henriksen et al. (2014)'s interesting case was a 58-year-old bipolar I patient with three previous manic episodes who was hospitalized during a manic episode. In addition to pharmacological treatment, he was treated with clear-lensed glasses for seven days, then one day without glasses, followed by six days of blue light-blocking glasses. As a result, manic symptoms were unaltered during the first seven days with clear-lensed glasses. The transition to the blue-blocking regime was followed by a rapid and sustained decline in manic symptoms accompanied by a reduction in total sleep, a reduction in motor activity during sleep intervals, and

markedly increased regularity of sleep intervals. The patient's total length of hospital stay was 20 days shorter than the average time during his previous manic episodes. These findings suggest a hypothesis that both seclusion to dark room and orange-tinted glasses as blue light blockers may bring about anti-manic effects.

Currently, one of our outpatients is suffering from bipolar II disorder and, in addition to maintenance lithium and lamotrigine; he uses bright light apparatus during his depressive phase and orange-tinted glasses during his hypomanic phase to keep his mood stable. Because he understands the nature of the disease and treatment as a whole and there is shared decision making between the patient and doctor, his self-esteem is higher and good adherence to both light modulation and pharmacotherapy is achieved.

In conclusion, we would like to coin the term ‘light modulation therapy’ to describe the combination of bright light apparatus for depressive mood and orange-tinted glasses for hypomanic/manic mood of bipolar patients, which may keep mood more stable in comparison to pharmacotherapy only. This new approach to the treatment of bipolar disorders warrants further study.

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