

Are short (blue) wavelengths necessary for light treatment of seasonal affective disorder?

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Abstract

Despite widely published speculation regarding a potential potency advantage of short-wavelength (blue-appearing) light for Seasonal Affective Disorder (SAD) treatment, there have been few systematic studies. Those comparing short-wavelength to broad-wavelength (white) light under actual clinical conditions suggest equivalent effectiveness. This multicenter, parallel-group design trial was undertaken to compare the effects of light therapy on SAD using blue (~465 nm) versus blue-free (595-612 nm) LED lights. Fifty-six medication-free subjects aged 21-64 years who met DSM-IV-TR criteria for recurrent major depression with winter-type seasonal pattern were enrolled in this blinded study at five participating centers between January and March 2012. Thirty-five subjects met the criteria for randomization to 30 min of either blue (~465 nm) or blue-free (595-612 nm) daily morning light therapy. Twenty-nine subjects completed the study; three subjects withdrew due to treatment-related adverse events, including migraines, and three withdrew for non-study-related reasons. The primary effectiveness variable was depression score (SIGH-ADS) after six weeks of daily light treatment. Secondary effectiveness variables included quality-of-life (QoL) and suicidality ratings. Using an intent-to-treat analysis, mean depression scores were different at baseline for the blue group (29 ± 5 versus 26 ± 5 , $p = 0.05$ blue versus blue-free, respectively), and the initial score was used as a covariate. Baseline scores were not significantly different between treatment groups among those who completed the study, and no significant differences in depression scores were observed after 6 weeks (mean \pm SD scores at 6 weeks: 5.6 ± 6.1 versus 4.5 ± 5.3 , $p = 0.74$, blue versus blue-free, respectively). In addition, the proportion of subjects who met remission criteria, defined as a depression score ≤ 8 , was not significantly different between the two groups ($p = 0.41$); among the 29 subjects who completed the study, 76% of subjects experienced remission by the end of the trial, which coincided with the beginning of spring. The QoL and suicidality ratings were also significantly improved from pre- to post-treatment, with no significant difference between treatments. No subject experienced worsening or non-improved symptoms over the 6-week trial. The main finding of this study is that subjects treated with blue light did not improve more than subjects treated with blue-free light; both showed substantial improvement on multiple measures. Failure to find differences may have resulted from methodological constraints, including a small sample size. Recruitment began mid-winter during an unusually mild season, and the trial was terminated earlier than planned by the study sponsor due to a failure to detect a difference. However, if confirmed in a larger randomized sample, these results suggest that blue wavelengths are not necessary for successful SAD treatment..