Bright light and high density negative air ionisation reduced symptoms in seasonal affective disorder


**Question**
In patients with seasonal affective disorder (SAD), do timed bright light and negative air ionisation reduce symptoms?

**Design**
Randomised, morning by evening light crossover trial balanced by parallel group controls, in addition to a non-photic control (negative air ionisation), with follow up to 4 weeks.

**Setting**
Psychiatry department in New York, New York, USA.

**Patients**
158 patients between 18 and 65 years of age who were recruited through media and physician referrals with a DSM-III-R diagnosis of SAD. Exclusion criteria included other Axis I disorders, suicide attempt within the previous 3 years, and habitual sleep onset later than 1 am or awakening later than 9 am. 145 patients (92%) completed the study.

**Intervention**
Patients were allocated to 6 groups for 2 consecutive treatment periods, each lasting 10–14 days. 2 parallel groups received morning treatment with negative ions. 4 groups received light treatment and were crossed over at mid point using the following sequences: morning-evening, evening-morning, morning-morning, and evening-evening (10 000 lux, 30 min/d). 2 groups received negative air ionisation treatment at either high density (2.7 x 10^9) or low density (serving as the placebo control, 1.0 x 10^9 per cubic centimeter) (high-high and low-low sequences, 30 min/d in the morning). All treatments lasted for 20–28 days with a 1–3 week withdrawal phase.

**Main outcome measure**
Symptom severity assessed using the Structured Interview Guide for the Hamilton Depression Rating Scale-Seasonal Affective Disorder Version (SIGH-SAD).

**Main results**
Data are reported for the 124 patients who relapsed or who remained depressed during the withdrawal to ensure that clinical improvement was not caused by spontaneous remission. Patients in the light treatment and the high density negative air ionisation treatment groups improved in percentage change scores on the depression scale. Bright light in the morning or evening and high density negative ions led to clinically important relief with > 50% reduction in depressive symptoms in at least half of the patients receiving the treatment (table). Remission (defined as a SIGH-SAD score of ≤ 8 after treatment) rates were higher in the morning light, evening light, and high ions groups compared with the low ions group at week 4, and in the morning v evening light comparison (table).

**Conclusion**
Bright light and high density negative ionisation reduced depressive symptoms in patients with seasonal affective disorder.

**Outcome**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Morning light, evening light, high density ions</th>
<th>Low density ions</th>
<th>RBI (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement in depressive symptoms</td>
<td>67%, 61%, 55%</td>
<td>26%, 26%, 20%</td>
<td>155% (29 to 479), 131% (17 to 430), 109%</td>
<td>3 (2 to 8), 3 (2 to 13), not significant</td>
</tr>
<tr>
<td>Remission (SIGH-SAD ≤ 8)</td>
<td>56%, 30%, 40%</td>
<td>5%, 5%, 3%</td>
<td>972% (122 to 6014), 478% (15 to 3266), 660% (45 to 4394)</td>
<td>2 (1 to 4), 3 (2 to 11)</td>
</tr>
</tbody>
</table>

**Commentary**
In general, the treatment of winter depression (or SAD) is similar to that of other forms of affective disorder except that bright light exposure has been recommended as the first line treatment option (the administration of visible light producing the intensity of at least 2500 lux towards the face). Indoors, at home, the intensity of light measured in front of the eyes of a standing person is typically ≤ 100 lux, and 300 to 500 lux at the workplace. Outdoors, the level of illumination varies greatly by latitude, season, time of day, and local weather conditions, ranging from about ≤ 2000 lux on a cloudy winter day to > 10 000 lux in direct sunshine. A previous overview of controlled trials with 322 patients showed that light of 2500 lux in 2 hour daily morning sessions for 1 week improved 67% of patients with mild, and 40% with moderate to severe episodes of winter depression. Recently, the use of higher intensities (up to 10 000 lux) and shorter exposures (down to half an hour) has been reported to yield equally good response rates. Designs of bright light trials have been compromised, however, by a lack of adequate control for placebo and blinding.

The studies by Terman et al and Lewy et al overcome some of these design problems and confirm earlier data which show that bright light treatment is effective and well tolerated in patients with winter depression. The study by Terman et al, together with the results from another recent study, gives evidence that morning bright light treatment has an antidepressive (continued on page 88)
Bright morning light reduced depressive symptoms in seasonal affective disorder


Question
In patients with seasonal affective disorder (SAD), is morning or evening light more effective in reducing symptoms?

Design
Randomised, crossover trial with follow up to end of treatment.

Setting
Sleep and Mood Disorders Laboratory in Portland, Oregon, USA.

Patients
56 patients between 25 and 61 years of age who were recruited through media and referrals from health professionals with a DSM-III-R diagnosis of SAD and a score of $\geq 20$ on the Structured Interview Guide for the Hamilton Depression Rating Scale-Seasonal Affective Disorder Version (SIGH-SAD). Exclusion criteria included poor physical health, ideas or attempts of suicide, use of psychotropic medication, and other Axis I-III disorders. 5 patients did not complete the study. 52 matched controls with no notable medical or psychiatric problems also participated. 3 controls did not complete the study.

Intervention
After a baseline assessment period patients were allocated to bright light at either 6–8 am or 7–9 pm for 2 weeks. After 1 week of withdrawal from light treatment, patients were crossed over to the alternate light schedule.

Main outcome measures
Symptom severity assessed using the SIGH-SAD and dim light melatonin onsets.

Main results
During the course of treatment, SIGH-SAD scores for patients in the morning light group decreased twice as much as scores for patients in the evening light group. Remission (defined as $\geq 50\%$ decrease in SIGH-SAD ratings to a score after treatment of $\leq 14$) occurred in 19 patients receiving morning light compared with 3 patients receiving evening light (table). Morning light advanced the dim light melatonin onset and evening light delayed it in both patients and control participants. Patients were delayed compared with control participants at all assessment points of the study.

Conclusion
Bright morning light reduced depressive symptoms in patients with seasonal affective disorder.

Morning light v evening light in patients with seasonal affective disorder (treatment duration 2 wk)$^6$

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Morning Light</th>
<th>Evening Light</th>
<th>RBI (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remission</td>
<td>37%</td>
<td>6%</td>
<td>533% (119 to 1831)</td>
<td>4 (3 to 7)</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary; RBI, NNT, and CI calculated from data in article.

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