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Brief report

Morning sunlight reduces length of hospitalization in bipolar depression

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Abstract

Background: Bright artificial light improves non-seasonal depression. Preliminary observations suggest that sunlight could share this effect. *Methods*: Length of hospitalization was recorded for a sample of 415 unipolar and 187 bipolar depressed inpatients, assigned to rooms with eastern (E) or western (W) windows. *Results*: Bipolar inpatients in E rooms (exposed to direct sunlight in the morning) had a mean 3.67-day shorter hospital stay than patients in W rooms. No effect was found in unipolar inpatients. *Conclusions*: Natural sunlight can be an underestimated and uncontrolled light therapy for bipolar depression. *Limitations*: This is a naturalistic retrospective observation, which needs to be confirmed by prospective studies.

Keywords: Sunlight; Bipolar depression; Hospitalization

1. Introduction

The effectiveness of bright light therapy of depression may be not limited to seasonal affective disorder (SAD) (Kripke, 1998). Natural sunlight might share the clinical effects of artificial light. In SAD, natural light in the morning had the same efficacy of artificial light (Wirz-Justice et al., 1996), and severity of depression negatively correlated with photoperiod (Oren et al., 1994). Daily recordings revealed a relationship between mood, hours of sunlight, and solar irradiation in two non-SAD affective patients (Summers and Shur, 1992; Eagles, 1994). Unmonitored light therapy caused marked mood oscillations (Meesters and Van Houwelingen, 1998), and a strict control of the light/dark cycle improved treatment-refractory rapid-cycling bipolar illness (Wehr et al., 1998; Wirz-Justice et al., 1999).

The orientation of rooms in a Canadian ward provided a 'natural experiment' on the relationship between sunlight and length of hospitalization for depression (Beauchemin and Hays, 1996). Patients

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in sunny rooms had a mean 2.6-day shorter hospitalization than patients in dimly lit rooms, a difference more marked in men (6.8 days) than in women (0.7 days).

Our ward is favourably situated to replicate and expand this naturalistic observation. In a corridor with rooms on either side, windows are oriented to East or West. Eastern rooms (E) receive direct sunlight in the morning, while western rooms (W) receive it in the evening. Ambient light intensity in the two conditions (avoiding direct sunlight, which reached more than 30 000 lux) showed wide differences: on a bright May day at 09:00 h an E room measured at 15 500 lux, and a W room at 1400 lux, while at 17:00 h an E room measured at 2700 lux, and a W room at 3000 lux; on a day with light clouds values were E = 1500 lux and W = 150 lux at 09:00 h, and E = 200 lux and W = 1500 lux at 17:00 h; while in a cloudy day values were E = 650 lux and W = 150 lux at 09:00 h, and E = 140 lux and W = 600 lux at 17:00 h.

Artificial bright light therapy has an higher efficacy in the morning (Lewy et al., 1998): if sunlight has the same effect, a difference should be detected between E and W conditions.

2. Method

We reviewed charts for all admissions for non-psychotic depression over a 3-year period (1996-98) with a diagnosis of major depressive disorder, single or recurrent, or bipolar disorder, depressive episode, moderate or severe (DSM IV criteria), without Axis I codiagnosis and with a length of stay longer than 6 days.

Rooms (E or W) had been randomly assigned based on first available free space. Psychiatrists in charge were the same for E and W rooms. Medications were administered upon clinical need.

According to daytime clinical activities, patients stayed in rooms in morning and evening hours. No exact recording of time spent in rooms is available.

Length of hospitalization was calculated for a sample of consecutively admitted 415 unipolar (110 males, 305 females) and 187 bipolar (66 males, 121 females) depressed inpatients, stratified by diagnosis, room of hospitalization, and season of admission.

3. Results

Results are summarized in Table 1.

No significant difference was detected in the unipolar group.

In the bipolar group hospitalization was significantly shorter for E rooms in the whole sample. Significant differences were detected for summer and fall admissions.

4. Discussion

Only bipolar depressed inpatients exposed to natural sunlight in the morning had an hospital stay

Table 1
Length of hospitalization in eastern (E) and western (W) rooms (days, mean±S.D.)[a]

Season	Number	E rooms	W rooms	*t* (df)	*P*
Unipolar patients					
Whole sample	290 E, 125 W	23.08±10.94	20.92±10.50	1.86 (413)	0.062
Winter	71 E, 36 W	21.43±10.24	19.11±9.63	1.13 (105)	0.260
Spring	95 E, 46 W	24.45±11.01	21.43±10.89	1.53 (139)	0.128
Summer	63 E, 15 W	24.00±11.99	24.80±12.81	0.22 (76)	0.819
Fall	61 E, 28 W	21.91±10.35	20.32±9.51	0.69 (87)	0.490
Bipolar patients					
Whole sample	113 E, 74 W	19.80±9.48	23.47±11.78	2.35 (185)	0.020
Winter	37 E, 25 W	20.95±10.29	20.96±11.70	0.01 (60)	0.996
Spring	30 E, 15 W	19.60±8.20	21.06±9.88	0.53 (43)	0.600
Summer	20 E, 13 W	16.70±7.58	23.92±11.04	2.23 (31)	0.033
Fall	26 E, 21 W	20.77±10.86	27.90±12.97	2.05 (45)	0.046

[a] Data were analyzed with Student's *t*-test.

shorter than patients exposed in the evening, with no gender effects. Given the sex distribution of unipolar and bipolar disorder, it is possible that the previously reported sex differences on the effects of sunlight (Beauchemin and Hays, 1996) could be due to the effect of the unipolar/bipolar dichothomy.

Bipolar patients showed an increased sensitivity to the biological effects of light (Lewy et al., 1981, 1985). Exposure to natural light was not different in subjects with and without complaints of seasonal mood variations, thus suggesting a different sensitivity to light to explain individual differences in the relationship between light and mood (Guillemette et al., 1998). Differences in sensitivity to light in the diagnostic groups could explain the differences in the effect of morning sunlight between bipolar and unipolar patients observed in our study.

Differences between E and W conditions were more marked during summer and fall and were absent during winter and spring. This could be due to differences in light intensity along seasons, since bright light is effective in bipolar depression both during summertime (Bauer, 1993) and winter (Deltito et al., 1991). Seasonal rhythms of mood may contribute to explain this difference (e.g. Madden et al., 1996).

Our results support the hypothesis that exposure to morning sunlight can have therapeutic effects in bipolar depression, and are consistent with studies stressing the role of photoperiodic mechanisms in the course of bipolar illness (e.g. Lewy et al., 1981), and of environmental changes on mood variations (e.g. Madden et al., 1996). Aware of the methodological issues raised by a retrospective 'natural experiment', we expect our results to be confirmed by prospective studies.

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