An Open Trial of Light Therapy for Women With Seasonal Affective Disorder and Comorbid Bulimia Nervosa

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Objective: Many patients with seasonal affective disorder (SAD) have dysfunctional eating behaviors. Conversely, many women with bulimia nervosa have marked winter worsening of mood and bulimic symptoms. Controlled studies of light therapy in SAD and in bulimia nervosa have shown beneficial effects on mood and binge/purge symptoms. We explored the clinical use of light therapy in women with SAD who also had comorbid bulimia nervosa.

Method: Twenty-two female patients diagnosed using DSM-IV criteria with both bulimia nervosa and major depressive disorder with a seasonal (winter) pattern were treated with an open design, 4-week trial of light therapy (10,000 lux fluorescent light box with an ultraviolet filter, 30 to 60 minutes per day in the early morning). Patients were assessed before and after treatment with depression scales and with binge/purge diaries.

Results: Light therapy resulted in significant improvement in mood, with a mean 56% reduction in 29-item Hamilton Rating Scale for Depression scores following treatment ($p < .001$). The frequency of binges and purges per week also significantly decreased ($p < .001$) from baseline by a mean of 46% and 36%, respectively. Two (9%) of 22 patients became abstinent of binge/purge episodes, compared with 10 (45%) of 22 patients who met criteria for remission of depressive symptoms. The light therapy was well tolerated by patients.

Conclusion: These results suggest that therapeutic effects of light therapy on mood and bulimic symptoms in patients with SAD and comorbid bulimia nervosa are sustained over at least 4 weeks. However, the low abstinence rate in bulimic symptoms indicates that light therapy may be most effectively used as an adjunctive treatment to medications and/or psychotherapy for bulimia nervosa.

(J Clin Psychiatry 2001;62:164–168)

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Supported in part by grants from the BC Health Research Foundation and the Medical Research Council of Canada (Dr. Lam).

Preliminary results of this study were presented at the 12th Annual Meeting of the Society for Light Treatment and Biological Rhythms, Evanston, Ill., May 14, 2000, and at the 50th Annual Meeting of the Canadian Psychiatric Association, Victoria, British Columbia, Canada, Oct. 4, 2000.

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Accumulating evidence indicates that the relationship between seasonal mood disturbances and eating disorders is complex. Several investigators have described overlapping clinical features between seasonal affective disorder (SAD) and bulimia nervosa.[1–5] The mood symptoms of winter SAD, a syndrome consisting of regular winter depressive episodes followed by spring/summer remissions or hypomanic symptoms, are commonly associated with dysfunctional eating behaviors, including carbohydrate craving, hyperphagia, and weight gain.[6–9] In clinic samples of patients with SAD, 17% to 26% are described as having comorbid eating disorders, particularly bulimia nervosa.[8,10] Conversely, the recurrent binge-eating and purging episodes characteristic of bulimia nervosa are often accompanied by winter worsening of mood and affect.[4,5,11–13] Additional evidence suggests a commonality between SAD and bulimia nervosa that goes beyond clinical manifestations, including common neuroendocrine abnormalities[14,15] and similar responses to serotonergic antidepressants.[16,17]

Bright light therapy, also known as phototherapy, has been shown to be a safe and effective treatment for the depressive symptoms of SAD.[18–20] Light therapy has also been investigated in 3 controlled but brief-duration studies of bulimia nervosa.[21–23] Two of the 3 studies[21,23] found a significant reduction in binge-eating episodes after light therapy, 1 study[21] found significant decrease in purging episodes, and 2 studies[21,22] showed significant improvement in mood symptoms. However, these studies were conducted in women with a primary diagnosis of bulimia nervosa but with mixed depressive diagnoses, so the study samples differed in the proportions of bulimia ner-

Table 1. Demographic and Clinical Baseline Information for Patients With Seasonal Affective Disorder (SAD) and Comorbid Bulimia Nervosa (N = 22)[a]

Patient	Age, y	No. Lifetime Episodes	Month Treated[b]	Month of Remission[c]	Medication, mg/d	HAM-D-29	BDI	Binges/ Week	Purges/ Week
1	30	8	Sep	Mar	Imipramine, 150	43	33	9	9
2	33	5	Sep	Mar		35	25	6	5
3	28	10	Sep	Apr	Fluvoxamine, 100	25	18	8	7
4	30	10	Sep	Apr		31	25	9	7
5	32	10	Sep	Apr		28	16	10	2
6	44	3	Sep	May	Fluoxetine, 40	42	38	5	4
7	27	4	Oct	Feb		30	37	7	7
8	32	5	Oct	May		34	18	14	14
9	38	10	Oct	May		34	31	13	10
10	28	10	Oct	Jul		30	29	15	11
11	28	10	Oct	Mar	Fluoxetine, 20	29	39	14	14
12	20	4	Oct	Apr		28	26	15	15
13	33	6	Oct	May	Fluoxetine, 20	33	19	3	3
14	29	6	Nov	Apr	Sertraline, 50	34	35	9	8
15	29	8	Nov	Apr		37	29	6	6
16	29	5	Nov	May		36	27	13	11
17	35	15	Nov	Apr	Fluoxetine, 20	32	24	15	14
18	18	5	Nov	Apr	Clomipramine, 50	35	28	3	3
19	31	10	Dec	Mar		44	28	13	13
20	30	3	Jan	Apr	Fluvoxamine, 200	24	19	10	8
21	35	3	Jan	Apr		35	20	10	10
22	25	8	Feb	May	Fluoxetine, 60	43	24	7	7
Mean	30.2	7.2				33.7	26.7	9.7	8.5

[a]Abbreviations: BDI = Beck Depression Inventory, HAM-D-29 = 29-item Hamilton Rating Scale for Depression, SAD version.
[b]Start of 4-week light therapy trial.
[c]Month of usual remission of SAD episode.

vosa patients who were not depressed, who had nonseasonal major depression, who had seasonal symptoms that did not meet diagnostic criteria for SAD, and who had SAD. In fact, only 8 of 57 bulimia nervosa patients had comorbid SAD in these 3 studies, and outcome was assessed after only 1 or 2 weeks of light treatment. Hence, although bulimia nervosa is commonly found in patients with SAD, it is unclear whether the bulimic symptoms experienced by these patients would also respond to light therapy.

We now report on an open-design study of light therapy for a larger group of patients with SAD who also had comorbid bulimia nervosa by DSM-IV criteria. The objectives of this study were to evaluate the effects of a standard light therapy regimen in these patients over a longer, 4-week treatment period and to explore the relationship between effects of light therapy on mood and eating symptoms.

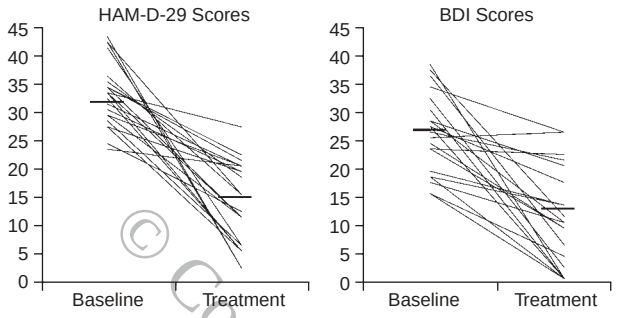
METHOD

This is a retrospective study of clinical data from the Seasonal Mood Disorders Clinic at the University of British Columbia (UBC) Hospital. Publication of blinded data from the clinic was approved by the UBC Human Ethics Committee. The Seasonal Mood Disorders Clinic is part of a larger Mood Disorders Program at the UBC Hospital in Vancouver, British Columbia, Canada (latitude 49°N). Referrals to the clinic were usually made by family physicians or psychiatrists; a smaller number were self-referred in response to advertisements for seasonal studies. Patients were interviewed and assessed by experienced, board-certified psychiatrists, and clinical diagnoses were assigned using DSM-IV criteria based on all available medical information. Clinical information was recorded for each patient using a symptom checklist (available on request).

Of the patients with a DSM-IV diagnosis of recurrent major depressive disorder with a winter seasonal pattern (similar to SAD), 22 female patients were identified with comorbid bulimia nervosa. All the patients presented during the winter season for assessment of depression, had unipolar depressive episodes, and were actively bulimic at intake. None had previously used light therapy.

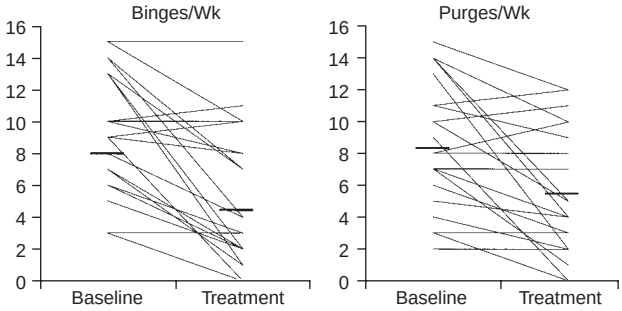
After a 2-week baseline period during which mood and bulimic symptoms were monitored, patients were treated with 4 weeks of light therapy in an open design with a standard light therapy protocol described in previous controlled studies.[18,24,25] A 10,000 lux fluorescent light box with an ultraviolet filter was used. After receiving instructions, patients used the light box at home for 30 to 60 minutes in the early morning, as soon as possible after waking (between 7:00 and 9:00 a.m.). Patients taking antidepressant medications were treated with light therapy only if the medication dosage had been stable for at least 4 weeks and they were still clinically depressed. Medication doses

Figure 1. Depression Scores Before and After 4 Weeks of 10,000 lux Light Therapy (N = 22)[a]



[a]Abbreviations: BDI = Beck Depression Inventory, HAM-D-29 = 29-item Hamilton Rating Scale for Depression, Seasonal Affective Disorder version. Bars indicate mean scores. Both measures showed significant reduction after treatment ($p < .001$).

Figure 2. Binge and Purge Episodes per Week Before and After 4 Weeks of 10,000 lux Light Therapy (N = 22)[a]



[a]Bars indicate mean scores. Both measures showed significant reduction after treatment ($p < .001$).

were not changed during the light therapy trial. Patients were rated before and after the 4 weeks of treatment, and compliance was checked by inquiry. Only patients who used the light box for at least 5 days of each week were considered to have an adequate trial. All treatment was conducted during the winter months well before the time of usual spontaneous remission.

Clinical assessments included the Structured Interview Guide for the Hamilton Depression Rating Scale, Seasonal Affective Disorder version,[26] which generates a 21-item Hamilton Rating Scale for Depression (HAM-D-21)[27] and an 8-item addendum that rates the atypical vegetative symptoms (HAM-D-8). Overall severity is rated with all 29 items (HAM-D-29). The Beck Depression Inventory (BDI)[28] was also completed by the patient. Clinical response for depressive symptoms was defined as a 50% or greater reduction in HAM-D-29 score after treatment, compared with baseline, whereas clinical remission was defined as a termination score of 12 or less.

Patients also kept a daily log of binge and purge episodes. The total number of binges and purges per week for the second baseline week and the final treatment week were analyzed. Clinical response for bulimia was defined as a 50% or greater reduction in binge or purge episodes per week, whereas clinical remission was defined as abstinence from binge eating or purging during the last treatment week.

Parametric data were analyzed using paired and unpaired t tests. The analysis was performed using SPSS version 8.0.[29] All results are reported as mean ± SD.

RESULTS

Table 1 provides demographic and clinical information for the 22 patients. The mean age was 30.2 ± 5.5 years (range, 18–44 years). The patients at baseline were moderately to moderately severely depressed as indicated by the mean HAM-D-29 score of 33.7 ± 5.6. They also had mild-to-moderate severity of bulimia nervosa as indicated by mean binge and purge episodes per week of 9.7 ± 3.9 and 8.5 ± 3.9, respectively. Of note is that although all patients endorsed winter worsening of their bulimic symptoms, they were not abstinent of binge/purge episodes during the summer, indicating that their bulimic behavior was not strictly seasonal.

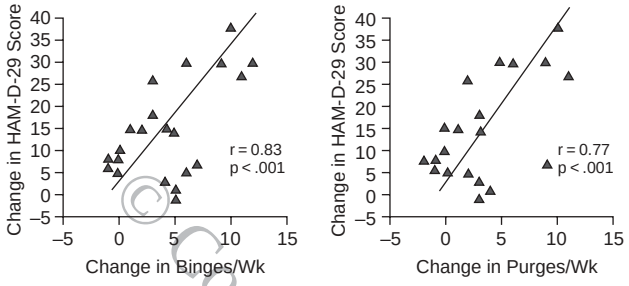
Figures 1 and 2 show results of the 4-week open trial of light therapy. Significant improvements were seen in both interviewer-rated HAM-D-29 scores ($t = 8.6$, $df = 21$, $p < .001$) and self-rated BDI scores ($t = 6.3$, $df = 21$, $p < .001$). Significant reductions were also found in number of weekly binge-eating episodes ($t = 5.2$, $df = 21$, $p < .001$) and purging episodes ($t = 4.0$, $df = 21$, $p < .001$). Overall, the mean percentage reductions in HAM-D-29 scores, binges per week, and purges per week were 56%, 46%, and 36%, respectively.

For our definition of clinical response (50% or greater reduction in scores compared with baseline), 55% (12/22) of patients showed a clinical response for the HAM-D-29 depression scores, while clinical response rates for binges and purges were 55% (12/22) and 45% (10/22), respectively. Additionally, 10 (45%) of the 22 patients met our criteria for clinical remission in depression scores (HAM-D-29 score at termination of 12 or less), in contrast to only 2 patients (9%) who became abstinent of binge-eating and purging episodes in the last treatment week.

Figure 3 shows the significant correlations between the change in HAM-D-29 scores and the change in binge-eating episodes per week ($r = 0.833$, $p < .001$) and the change in purging episodes per week ($r = 0.773$, $p < .001$). Similarly, the change in binge-eating episodes per week was significantly correlated to change in purging episodes per week ($r = 0.919$, $p < .001$).

Ten (45%) of the 22 patients were taking antidepressant medications during the light therapy trial. Most were

Figure 3. Correlations Between Change in Hamilton Rating Scale for Depression, Seasonal Affective Disorder Version (HAM-D-29) Scores and Binge/Purge Episodes per Week After 4 Weeks of 10,000 lux Light Therapy (N = 22)



taking selective serotonin reuptake inhibitor antidepressants at minimal therapeutic doses. No information was available for ratings of effectiveness of the medication prior to assessment, but all patients on medication treatment were still depressed and bulimic during the 2-week baseline phase. No significant differences were found between these patients and those who were medication free in baseline depression scores, number of binge-eating episodes, or number of purging episodes per week (data not shown). There were also no significant differences in the change scores for the depression ratings or binge-eating and purging episodes per week after light treatment (data not shown). The patients tolerated the light therapy well, with only mild side effects of headache (14% [3/22] of patients), eyestrain (9% [2/22]), edginess (9% [2/22]), and nausea (5% [1/22]).

DISCUSSION

These data must be interpreted with some caution because of the open nature of the light therapy method. More specifically, nonspecific placebo responses and expectation effects of the treatment cannot be discounted. It is possible that the observed effects are due mainly to the subject's expectation for improvement rather than to the efficacy of the light therapy. Another possibility is that patients improved owing to spontaneous remission of episodes, although each patient was treated well before her usual time of remission of symptoms (see Table 1).

Despite the limitations of the open design, these results are noteworthy. First, light therapy had significant therapeutic effects on both mood and eating symptoms in these female patients with SAD and comorbid bulimia nervosa. Depression ratings decreased substantially during the study, with a significant percentage (45%) of patients in clinical remission by the end of the 4-week treatment period. The bright light exposure also significantly reduced the frequency of both binge-eating and purging episodes. Second, the beneficial effects of the treatment were sustained over at least a 4-week period. At the onset of the study, patients were moderately to moderately severely depressed and had mild-to-moderate bulimia nervosa. By the end of the 4-week treatment period, the average reductions in depression scores and number of binges and purges per week were clinically as well as statistically significant.

The present study is consistent with some results from previous controlled studies of light therapy for bulimia nervosa. Lam and colleagues[21] compared bright white light (10,000 lux for 30 min/day) to a dim light control condition (500 lux red light) in a crossover study design for a 2-week treatment period in 17 bulimic women. The bright white light condition was superior to the control condition for all mood and eating outcome measures, including binge-eating and purging episodes. The patients with "seasonal" bulimia (i.e., including the 5 patients with comorbid SAD, 29% of the sample) had a significantly greater improvement in symptoms than the "nonseasonal" patients. Similarly, Blouin et al.[22] randomly assigned patients with bulimia nervosa into either bright white light (2,500 lux for 2 hours/day) or dim red light (500 lux for 2 hours/day) treatment conditions in a parallel study design for a 1-week period. Subjects treated with white light therapy had a significant improvement in mood compared with those in the control condition. Although no significant differences were found in binge-eating or purging frequencies, there was a noticeable decrease in these behaviors on days 6 and 7 during the bright light therapy condition only. Thus, 1 week of light therapy may not be sufficient to reduce the binge and purge behaviors. Although those 2 studies did not specifically select seasonal patients, both had a relatively high percentage of patients who had SAD and comorbid bulimia nervosa (29% and 17%, respectively).

A third study by Braun et al.[23] reported variable results. Thirty-four female outpatients with bulimia nervosa were treated with either 10,000 lux bright white light or a placebo condition (50 lux dim red light) in a parallel study design for a 3-week period. Despite significant decreases in binge frequency, the 2 groups did not significantly differ in either depression scores or in purging frequency. Braun's[23] sample, however, had a low percentage of patients who were currently depressed (23.5%; mean BDI score of 15), and none met DSM-IV criteria for major depression with a seasonal pattern (SAD). In contrast, in Lam's study[21] 47% of patients were currently depressed, the mean BDI score was 21, and 29% met DSM-III-R criteria for SAD. Similarly, Blouin's sample[22] had 72% of patients with current major depression, the mean baseline BDI score was 22, and 17% met DSM-III-R criteria for SAD. The different results from these studies may thus be related to differences in depression and seasonality among the study samples. However, they may also reflect the fact that the clearest responses were found in studies that included more seasonally depressed patients.

Extending this observation, we note that only 2 of 22 patients abstained from binge-eating and purging after the 4 weeks of treatment in our study, compared with 10 of 22 who were in remission from depressive symptoms. The low abstinence rate may reflect the fact that dysfunctional eating behaviors persist despite the reversal of an underlying pathophysiologic process, like a persistent habit. Theoretically, then, a longer period of light treatment may be required to produce higher abstinence rates in binge and purge episodes. Alternatively, the therapeutic effect of bright light therapy may be greater for depressed mood than for binge-eating and purging behavior. Finally, the improvement in bulimic symptoms may be secondary to changes in mood. Thus, light therapy may directly improve mood in these bulimic patients with SAD and thus indirectly improve dysfunctional eating behaviors. Our findings of high correlations between the change in depression scores and changes in weekly binge-eating and purging episodes lend support to this hypothesis.

Almost half of the women in this study (45%) were taking antidepressants, although most were on minimal therapeutic doses. All patients were symptomatic even after a minimum of 4 weeks on medication, and the doses were not changed during the light therapy trial. There were no differences in symptoms at baseline or in response after treatment between those patients on and off medication treatment. Regardless, we cannot rule out complex interactions between light treatment and medications for the observed therapeutic effects on mood and bulimic symptoms in this open-design study.

In summary, light therapy appears to be a beneficial treatment for patients with SAD who also have comorbid bulimia nervosa. Although the light treatment appeared to have a greater clinical effect on the winter depression symptoms, the mean percentage reductions of 46% and 36% in binge and purge frequencies are still clinically meaningful. The low abstinence rates for binge/purge episodes, however, suggest that these patients may require other treatments for full recovery from bulimia nervosa. We also suggest that the therapeutic effects of light therapy on binge-eating and purging symptoms in these patients are secondary to improvements in mood. Further controlled studies are required to confirm the specific effects of light therapy on seasonal mood and eating symptoms.

Drug names: clomipramine (Anafranil and others), fluoxetine (Prozac), fluvoxamine (Luvox), sertraline (Zoloft).

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