Nonmedical Management of Late Luteal Phase Dysphoric Disorder

A Preliminary Report

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The authors report the results of an open trial of group behavioral treatment for women with a prospectively confirmed premenstrual syndrome. Treatment consisted of five weekly group behavioral sessions outlining and supporting lifestyle changes in diet, exercise level, and stress management. Patients monitored symptoms and adherence to dietary and exercise recommendations daily. Results are discussed for the first 48 women to complete the trial. Eighty-three percent of patients demonstrated either a remission (n=28) or 50% reduction in symptoms (n=12) at one month following the group treatment. Improvements in physical and emotional symptoms were significantly associated with an increase in exercise.

Premenstrual syndrome (PMS) is a constellation of psychological, behavioral, and physical symptoms that occur in the luteal phase of a woman's menstrual cycle. Although isolated or minor premenstrual symptoms appear to be common, the occurrence of more severe, debilitating changes is relatively rare. These more severe symptoms have been labeled in the psychiatric nomenclature Late Luteal Phase Dysphoric Disorder (LLPDD).[1] Professional and lay literature have recommended alterations in lifestyle such as dietary changes and exercise as treatment options for PMS, despite a lack of empirical studies on their effectiveness.

Because common symptoms of PMS such as irritability and food cravings appear similar to symptoms of hypoglycemia, frequent feedings and a reduction in refined sugar have

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been suggested. Although there appears to be no evidence of altered glucose metabolism in the premenstrum,[2] the results of a study of nutrient intake in PMS women and controls suggest that carbohydrate intake increases premenstrually and that its timing may influence mood.[3] The consumption of caffeine also has been associated with premenstrual mood and physical changes in surveys,[4,5] but no controlled investigation has examined the effect of reducing caffeine. In addition, exercise is commonly listed as a treatment for PMS because of studies suggesting a negative association between level of physical activity and premenstrual complaints.[6,7] An increased level of exercise has been found to ameliorate premenstrual fluid and breast symptoms as well as dysphoria in normal women,[8] but its usefulness with premenstrual syndrome has yet to be assessed. Finally, investigators in two studies using cognitive and behavior therapy techniques (such as relaxation therapy and the relabeling of negative attributions) have reported PMS symptom reductions.[9,10] Although both of these studies lacked a control group and sample sizes were small (4 and 6), they represent some of the first attempts to evaluate nonpharmacological treatments using prospectively confirmed samples.

We report on the results of an open treatment study of 48 women with prospectively confirmed LLPDD who underwent a group behavioral treatment outlining lifestyle changes in diet, exercise, relaxation, and reduction of stress. Demographic variables, psychiatric history, and compliance with lifestyle changes were examined as predictors of treatment response. Because the study was conducted among women who were paying for their care, we were not able to implement all of the features of an ideal research project (random assignment, placebo control, intensive assessment of treatment adherence); however, because these methods of treating LLPDD have never been subjected to any empirical study, we believe these preliminary, nonexperimental results are of considerable interest.

METHODS

Subjects

Subjects were women who contacted the Healthsource Premenstrual Syndrome Clinic at the University of Pittsburgh following physician referral or in response to media announcements. Women requesting treatment were first sent assessment packets that contained 90 Daily Assessment Forms (DAFs) for prospective recording of symptoms. These forms were to be returned by mail. Women who met LLPDD criteria (see below) for two cycles were offered entrance to the clinic. Follicular and luteal assessment interviews were then conducted prior to the subjects' participation in treatment groups. The 48 women included in this report were between the ages of 18 and 45, had regular menstrual cycles, had no current psychiatric disorders, and were not regularly taking diuretics, psychoactive medications, hormones, or oral contraceptives. All women were required to attempt lifestyle changes as treatment before being considered for pharmacological intervention.

Diagnosis

The diagnosis of LLPDD was determined by applying rigorous percent change criteria to the daily ratings of symptoms recorded on DAFs by each subject over a 90-day period. The DAF is a 33-item symptom checklist that we developed to include items similar to the 10 symptoms in the DSM-III-R criteria for LLPDD; 18 of the 33 items are identical to items found on the Daily Rating Form.[11] Each item is rated using a scale from 1 (no distress) to 6 (extreme distress). Factor analysis of the DAF indicates that it is composed of four independent symptom dimensions: negative affect, physical symptoms, agitation, and positive arousal symptoms. Four summary symptom scales constructed on the basis of this factor analysis demonstrate high internal consistency (Cronbach's α) ranging from

0.70 (agitation) to 0.96 (negative affect).

The items on the DAF that corresponded to each of the 10 symptoms of the DSM-III-R LLPDD criteria were summed and averaged over the seven days before menses (premenstrual week) and the seven days after menses (postmenstrual week). Differences between premenstrual and postmenstrual averages were computed and expressed as a percent change. The subject met criteria for LLPDD on a given cycle if 1) the averages for at least 5 of 10 symptoms showed a 30% or greater premenstrual increase in severity and 2) postmenstrual average scores were less than 3. The 30% change criterion is in accordance with the recommendation of a National Institute of Mental Health panel.[12] The second requirement represents an attempt to exclude women with chronic symptomatology. At least one of the five symptoms was required to be either affective lability, irritability, anxiety, or depressed mood, as outlined in the DSM-III-R guidelines.

Measures: Demographics, Psychiatric History, Compliance

The follicular interview (conducted between menses and ovulation) included the collection of demographic data and administration of the Schedule for Affective Disorders and Schizophrenia (SADS)[13] to assess current and prior psychiatric disorders according to the Research Diagnostic Criteria.[14] Because of the possible misdiagnosis of a long and severe episode of LLPDD as an episode of major or minor depression, a duration of greater than one month was required in order to confirm these diagnoses. Patients monitored their adherence to recommendations of reducing caffeine and refined sugar and increasing aerobic exercise with daily logs documenting food and drink consumed and kinds and amounts of exercise. Compliance in these areas was rated by the clinician on a scale of 0 (not at all compliant) to 4 (very compliant), where no refined sugar products, no caffeinated beverages, and four 30-minute exercise sessions per week would receive scores of 4.

Group Treatment

Because the setting was an open clinic where patients paid for services, use of a placebo control condition was not viable. All patients participated in five $1\frac{1}{2}$-hour group sessions, each composed of six to seven patients and administered by two clinicians, in which recommended lifestyle changes were presented. Interventions were primarily didactic in focus. The proposed lifestyle changes were selected from among those suggested by other PMS programs or in the "self-help" literature.[15,16] Sessions occurred weekly for four weeks, with a fifth session scheduled at six weeks. Individual make-up sessions were offered for subjects who missed a group.

The initial group session was a 20-minute slide presentation introducing the common symptoms of PMS and providing an overview of likely etiologies and proposed treatments. The clinicians mentioned topics to be covered in subsequent group sessions (diet, exercise, relaxation, and stress reduction), but gave no specific information on the kinds of changes that patients would be asked to make. Women were asked to keep a baseline dietary log over the next week.

Each of the subsequent four group sessions focused on a particular aspect of lifestyle change: 1) diet; 2) exercise; 3) progressive relaxation training and guided practice; and 4) stress management. At each meeting, compliance with individually established weekly goals was reviewed and feedback and encouragement were offered. (More specific information on the group intervention is available from the authors.)

Individual one-hour follow-up sessions were available to patients at one, two, and four months post-treatment. These sessions occurred during the patient's premenstrual phase and were for the purpose of collecting and reviewing symptom ratings and compli-

ance logs and providing feedback concerning behavioral changes.

RESULTS

Sixty-six subjects who met entrance criteria and were not found to have current psychiatric illness by SADS interview completed the group treatment sessions. Forty-eight of these 66 subjects were still completing DAFs and daily logs at the one-month follow-up; only their data will be considered. Those who had incomplete data at follow-up were found not to differ significantly from the remaining 48 on demographic variables or baseline premenstrual severity. Demographic analyses revealed that most of the remaining 48 women were white (98%), in their early thirties (mean = 32.7 ± 5.5 years), educated beyond high school (75%), married (67%), with children (60.4%), and employed either full-time or part-time (69.7%). Average age of onset of PMS was 23. A substantial proportion had a history of depression, either major (48%) or minor (19%). Twelve percent of the parous women had experienced a postpartum major depression, and an additional 9% met criteria for a postpartum minor depression. Relatively few subjects had a history of generalized anxiety disorder (10%), alcohol abuse (6%), or drug abuse (6%).

Treatment efficacy was examined in two ways: 1) by comparing pre-treatment to post-treatment differences in symptom levels and 2) by examining the proportion of subjects who no longer met the 30% change criterion or who were substantially improved at the one-month follow-up (remission). For the first analysis, pre- to post-treatment changes in the DSM-III-R symptom areas were examined by comparing subjects' premenstrual week means at baseline and at the one-month follow-up. The results of paired comparison *t*-tests, summarized in Table 1, show significant reductions in each symptom area even with a Bonferroni correction for the number of tests ($P < 0.005$). On average, subjects showed significant decreases in symptoms following the group intervention.

As a strict index of clinically significant change, we examined the proportion of subjects who either no longer met LLPDD criteria at follow-up or demonstrated at least a 50% reduction in symptomatology as compared with baseline. Of the 48 women, 28 (58.3%) were no longer meeting our diagnostic criteria for LLPDD at the one-month follow-up point, and an additional 12 (25%) were at least 50% improved. While long-term follow-up data are unavailable on most of the initial improvers, the daily symptom ratings of those who continued record-keeping at

TABLE 1. Comparison of premenstrual symptom mean at baseline and post-treatment

Symptom	Baseline	Post-treatment	t[a]	$P <$
Irritability	2.94 ± 0.98	2.02 ± 0.79	6.50	0.0001
Fatigue	2.77 ± 1.07	1.85 ± 0.77	6.33	0.0001
Mood swings	2.72 ± 1.08	1.65 ± 0.84	8.14	0.0001
Anxiety	2.76 ± 1.08	1.87 ± 1.00	6.09	0.0001
Depression	2.40 ± 0.96	1.65 ± 0.69	5.79	0.0001
Physical symptoms	2.29 ± 0.78	1.75 ± 0.57	5.28	0.0001
Decreased concentration	2.33 ± 1.09	1.58 ± 0.70	5.44	0.0001
Social withdrawal	1.94 ± 0.95	1.40 ± 0.57	4.84	0.0001
Decreased appetite	1.42 ± 0.56	1.27 ± 0.44	1.86	0.0689
Increased appetite	2.71 ± 1.26	1.90 ± 1.09	4.14	0.0001
Decreased sleep	1.73 ± 1.01	1.34 ± 0.68	3.23	0.0023
Increased sleep	2.31 ± 1.20	1.51 ± 0.82	5.43	0.0001

Note: Values are means ± SD.
[a]Paired comparisons, 47 df.

four months post-treatment ($n = 17$) show that 14 (82%) were still remitted or were 50% improved while remaining drug free.

Factors Related to Improvement

Post-treatment exercise levels and diet were compared in remitted and nonremitted groups. Greater compliance with exercise and diet recommendations was expected among those experiencing resolution of symptoms. Remitters were found to have made significantly greater reductions in refined sugar consumption ($t = 1.9$, $P < 0.03$), but the groups were similar in post-treatment levels of exercise and caffeine consumption.

Correlations between adherence and symptom change from baseline to follow-up were examined. In order to reduce the number of tests, we examined the interrelationships among the 10 symptom change variables via a principal component factor analysis with varimax rotation. Three dimensions of symptom change (fatigue/social withdrawal, negative mood, and physical symptoms/cravings) emerged, which accounted for 64% of the variability in the change scores. Symptoms that were highly correlated with these factors were used to construct three summary scales, and scores on these three factor-based scales were correlated with compliance levels. The results are summarized in Table 2.

TABLE 2. Partial correlations between compliance and symptom change

Symptom Change (Baseline – Follow-up)	Mean Compliance at Follow-up		
	Caffeine	Sugar	Exercise
Fatigue/social withdrawal	–0.13	–0.03	0.18
Negative affect	–0.08	–0.09	0.27[a]
Physical symptoms/ cravings	0.07	0.18	0.41[b]

Note: Number of subjects = 48. Comparisons are one-tailed, accounting for baseline level of symptomatology.
[a] $P = 0.03$
[b] $P = 0.002$

Of sugar, caffeine, and exercise, only exercise was significantly related to symptom improvement. Exercise was significantly associated with improvement in physical symptoms and cravings even when controlling for initial level of symptomatology ($r = 0.41$, $P = 0.002$). Increased exercise was also associated with improvement in the group of negative mood symptoms (irritability, anxiety, mood swings, decreased concentration) regardless of baseline symptom severity ($r = 0.27$, $P = 0.03$).

With respect to demographic and psychiatric history variables, there was no association between treatment response and age, employment, marital status, education, or parity. Similarly, history of an Axis I psychiatric disorder did not relate to treatment outcome ($\chi^2 = 0.72$, not significant).

DISCUSSION

This preliminary open-treatment study suggests that lifestyle changes such as increased exercise may be efficacious in treating women with late luteal phase dysphoric disorder. Significant post-treatment reductions in all 10 DSM-III-R symptom areas were observed following a five-session group intervention outlining changes in diet, exercise, and stress management. At one month post-treatment, close to 60% of the women were no longer meeting the 30% change criterion required for a diagnosis, and an additional 25% showed dramatic reductions in symptoms. Among those initially improved, 82% of those available for follow-up four months after treatment either were still remitted or had improved significantly without the use of medication.

As in prior studies based on non-LLPDD subjects, in our study increased exercise was associated with improvement in both emotional and physical premenstrual symptoms. This suggests that fairly modest increases in physical activity (30 minutes of aerobic activity 3 to 4 times weekly) may effect change. The beneficial effects of exercise may have

been mediated through physiological changes, such as increased conditioning, or they may have resulted from psychological benefits such as increased self-efficacy and improved self-concept. Future studies might attempt to examine this question as well as whether the type or intensity of exercise is related to the degree of improvement. The symptom change attributed to exercise may also have been influenced by improved stress management or relaxation, which were not monitored throughout treatment in order to make the patients' record-keeping tasks manageable. Perhaps women with high exercise compliance scores were also generally compliant with these other aspects of lifestyle changes. Future dismantling and placebo-controlled studies may be able to identify those components of the group intervention (including nonspecific factors such as peer and clinician support) that are most crucial to improvement.

Although sugar and caffeine consumption were not significantly related to symptom improvement, the fact that remitters demonstrated more compliance than nonremitters in reducing refined sugar supports numerous reports from patients who attribute positive changes to the elimination of such products. Perhaps the crudeness of our measure of dietary adherence or our failure to assess other relevant aspects of dietary change (such as an increase in complex carbohydrates) contributed to the negative finding in this area.

Because this report excludes women with irregular menstrual cycles, our preliminary findings may be more representative of women with regular cycles. A more significant limitation of this report is the lack of a control group with which to evaluate the extent of placebo response. The two- to three-month baseline period, however, provided an opportunity to observe the occurrence of spontaneous remissions prior to the start of treatment; these spontaneous remissions could have indicated a sensitivity to monitoring effects or susceptibility to placebo response. Spontaneous remissions, or failure to meet criteria on baseline cycles subsequent to cycle one, occurred in only 7 of 48 (14.5%) cases; χ^2 analysis revealed these to be equally distributed among remitted (4 of 28) and nonremitted (3 of 20) groups, making it unlikely that an unstable clinical syndrome or monitoring effects were responsible for the positive responses observed. Moreover, in a significant number of cases remission or improvement was maintained over 16 weeks.

This report selected for a homogeneous population of women who showed at least a 30% premenstrual increase in 5 out of 10 symptoms of LLPDD. Results suggest that lifestyle changes (particularly increased exercise) may be efficacious in reducing physical and affective premenstrual symptoms, regardless of the severity of the condition. It remains to be seen whether the treatment of very severe cases of LLPDD requires more extensive lifestyle changes or whether adjunctive medical management may still be necessary in some cases. Our results, although in need of replication in a placebo-controlled trial, suggest that lifestyle changes may be a safe and viable alternative to pharmacological agents in women with late luteal phase dysphoric disorder.

The findings described in this article were set forth in a poster presentation of new research (Abstract #509) at the 143rd American Psychiatric Association Annual Meeting, New York, May 16, 1990.

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