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ORIGINAL ARTICLE

Cognitive behavioral therapy in combination with systemic family therapy improves mild to moderate postpartum depression

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Objective: To explore the effect of cognitive behavioral therapy (CBT) in combination with systemic family therapy (SFT) on mild to moderate postpartum depression and sleep quality.
Methods: 249 primiparous women with mild to moderate postpartum depression were recruited and randomly assigned to a control group (n=128), which received conventional postpartum care, or to a psychological intervention group (n=121), which received conventional postpartum care combined with psychological intervention. The Edinburgh Postnatal Depression Scale (EPDS) and Pittsburgh Sleep Quality Index (PSQI) were employed to evaluate depression and sleep quality, respectively.
Results: 104 patients in the intervention group and 109 in the control group completed the study. After intervention, the EPDS score, PSQI score, sleep quality score, sleep latency score, sleep duration score, habitual sleep efficiency score, sleep disturbance score, and daytime dysfunction score were significantly lower in the intervention group than in the control group. The EPDS and PSQI scores of each group at different time points after intervention were markedly decreased compared with those before intervention, and the reduction in the intervention group was more evident than that in the control group.
Conclusion: CBT in combination with SFT can improve depression and sleep quality in patients with mild to moderate postpartum depression.

Keywords: Cognitive behavioral therapy; systematic family therapy; postpartum depression; psychological intervention

Introduction

Postpartum depression is a common postpartum psychiatric syndrome. The prevalence of postpartum depression is 7.6-20.9%[1,2] in China and 9.6-23% in other countries[3,4]; it may affect appetite and sleep of puerperae and influence their recovery[5] as well as breast feeding,[6] and may cause adverse effects on the physical and psychological development of infants.[7,8] In addition, postpartum depression may also compromise the sexual desire of primiparous women, affecting quality of life of couples and conjugal relations.[9] Pharmacotherapy and psychotherapy are available for postpartum depression. For patients with severe postpartum depression, pharmacotherapy has favorable efficacy, but the treatment course is relatively long, and favorable therapeutic efficacy is usually achieved after 4-8 weeks of treatment. Moreover, long-term maintenance treatment is required when the symptoms are found to be improved, which has an adverse effect on primiparous women and their infants.[10] Currently, controversy remains as to the best antidepressant therapy for breastfeeding women, and pharmacotherapy is often unacceptable to patients and their relatives.[11] For patients with mild to moderate depression, the effect of psychotherapy is comparable to that of pharmacotherapy. Furthermore, psychotherapy has no adverse effects on primiparous women and their infants. Thus, physicians increasingly recommend psychotherapy in primiparous women with postpartum depression.[12]

The occurrence of postpartum depression is related to multiple factors, of which negative belief and absence of family support are two major contributors. Negative cognition and negative belief is a basic cause of depression.[13] The absence of family support may promote the development of depression.[14,15] The insufficiency of mutual understanding or even conflicts and tension among family members are the main cause of absence of family support. In the present study, patients with mild to moderate postpartum depression were recruited and received cognitive behavioral therapy (CBT) in combination with systemic family therapy (SFT) to investigate the effect of this psychological

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strategy on symptoms of depression and quality of sleep in these patients. On one hand, CBT was used to improve unadaptive behaviors and constructive beliefs to replace unreasonable, self-defeating thoughts and beliefs and thus enhance coping capacity. On the other hand, in SFT, the interactive mode and problems of family members were analyzed to make these individuals recognize that these problems are a result of failure in communication and the nature of the relationship among family members. At the same time, measures were taken to resolve conflicts and tensions, which may attenuate the pressure caused by family conflicts and improve the function of the family as a unit.

Subjects and methods

Subjects

From January 2008 to July 2009, a total of 1,713 primiparous women who underwent postpartum physical examination 42 days after delivery were recruited from the Maternal and Child Health Hospital in Dongguan, Guangdong, China. Before inclusion, they were screened with the Edinburgh Postnatal Depression Scale (EPDS),[16] Pittsburgh Sleep Quality Index (PSQI)[17] and Short form of the Wechsler Intelligence Scale for Adult-Chinese Revised (WAIS-RC).[18] Depression was diagnosed by experienced physicians on the basis of criteria described in the Structured Clinical Interview for DSM-IV-TR Axis I Disorders.[19,20] The inclusion criteria were as follows: 1) symptoms met the criteria for depression, but severe depression was absent; 2) the depression lasted for more than 2 weeks; 3) depression was initially found after delivery; 4) patients had concomitant sleep disorder and PSQI score was $\geqslant 7$; 5) patients were aged 19-40 years; 6) patients were recruited at 42 days after delivery, were primiparous and had a full-term singleton birth; 7) patients cooperated with this study. Exclusion criteria: 1) patients had a history of personality disorder, mental retardation, prenatal psychiatric or other organic diseases; 2) patients had prenatal or intrapartum complications; 3) infants had deformities, severe asphyxia, or organic diseases. Informed consent was obtained from all patients. The study protocol was approved by the Ethics Committee.

A total of 262 patients meeting the inclusion criteria were recruited, of whom 13 refused to participate in this study (distant habitation: n=8, short maternity leave: n=3; living alone after divorce: n=2). Finally, 249 patients participated in this study. Patients with an odd admission number (n=121) received psychotherapy. The mean age of this group was 28 ± 3 years. Patients with an even admission number (n=128) served as controls. Their mean age was 28 ± 4 years. During the study, 36 patients withdrew, of whom 17 were in the psychotherapy group (busy with work: n=10; refusal of repeated follow-up: n=4; emigration: n=3) and 19 were in the control group (busy with work: n=14; accidental pregnancy: n=2; family calamity: n=3).

A total of 213 patients completed this study: 104 women in the psychotherapy group and 109 women in the control group. Among the 104 women in the psychotherapy group, 32 lived in cities and 72 in towns; 40 were employed; four had an education level of lower than elementary school, 36 of junior high school, 41 of senior high school, and 23 of college for professional training or higher education; the economic status was good in 3 women, general in 76, and poor in 25; 17 had publicly funded health insurance, 13 had social health insurance, 8 had commercial health insurance, and 66 were self-paying patients. Among the 109 women in the control group, 33 lived in cities and 76 in towns; 42 were employed; four had an education level of lower than elementary school, 39 of junior high school, 43 of senior high school, and 23 of college for professional training or higher education; the economic status was good in 3 women, general in 82, and poor in 24; 18 had publicly funded health insurance, 14 had social health insurance, 8 had commercial health insurance, and 69 were self-paying patients. There were no significant differences in demographics between the two groups ($p > 0.05$ for all).

Treatments

Psychotherapy sessions began 2 months after delivery and were discontinued 5 months after delivery (total of 3 months). Treatment took place from February 2008 to November 2009 for all patients. The providers had more than 7 years' experience in psychological counseling and psychotherapy and were certified by the National Psychological Counselor (Grade II). In addition, these providers received systematic training for CBT (four trainings and supervisions for a total of 250 h) and SFT (five trainings and supervisions for a total of 162 h). Before intervention, they received uniform training and supervision.

In the control group, women received routine postnatal care. In the psychotherapy group, women underwent CBT and SFT in addition to routine postnatal care. Before intervention, the trained providers explained the methods, rationales, effects and cautions to patients and their relatives, and the intervention was performed only after informed consent was obtained.

CBT

A manual for CBT was prepared on the basis of previously described CBT for women with postpartum depression.[21,22] According to the predicted results and advice from experts, this manual was revised (Table 1). CBT was delivered in 13 sessions, with one-on-one psychological counseling. Intervention was done once weekly (60 min each) for a total of 13 weeks. The contents of the manual were as follows:

SFT

CBT alternated with SFT. Intervention encompassed the family members, including couples, parents of couples, and other important family members. The procedures were as follows: 1) a therapeutic interview was done twice monthly (60-90 min for each; a total of six times).

Table 1 Contents of operation manual for management of postpartum depression with cognitive behavioral therapy

Therapeutic stages	Treatment measures
1st stage (1st to 3rd session): psychological diagnosis	Establishment of therapeutic alliance: according to principles of cooperation empiricism, empathy, sincerity, unconditional positive attention and others were used to establish a therapeutic alliance. Information gathering and evaluation: living environment (family condition, childhood experiences, current living background and work experience), stimuli (important life events, especially events in pregnancy and puerperium), mood/symptoms of depression, therapeutic expectations, and goals. Psychological education: reasonable emotional therapy and recognition of depression. Case analysis: analysis of cognitive behaviors of depression Determination of therapeutic goals: long, moderate, and short-term therapeutic goals. Homework: thinking diary, recording recognized symptoms of depression and irrational beliefs.
2nd stage (4th to 7th session): working through	Recognition of irrational beliefs: socratic dialogue, dealing with occasional behaviors, decatastrophizing, "Pie chart" technique, proof test and other methods were used to help subjects recognize depression-related irrational beliefs. Reconstruction of recognition: validity check, response prevention, altering self-control, and active self-reporting/self-recording were used to change the irrational beliefs and to establish reasonable recognition mode. Psychological education: influence of transposition thinking on mood. Case analysis: core beliefs and conditions assumptions were used for longitudinal resolution to recognize the susceptible, induction, maintenance and protective factors. Homework: changes in symptoms of depression and irrational beliefs and therapeutic efficacy were recorded and discussed with the counselor before the interview.
3rd stage (8th to 12th session): consolidation	Role-playing, self-directed, and stress inoculation trainings were employed to promote the analysis and apperception of their own recognition modes and to consolidate the active recognition modes. Training of recognition behaviors: mobilize patients to apply feasible behavioral measures to rectify irrational beliefs and negate the irrational beliefs by practicing. Health education: educate on the relationship between interpersonal relations and depression and encourage patients to actively pursue social (mainly family) support. Homework: the process of apperception and experience in the behavioral therapy were recorded and discussed with counselors before interviewing.
4th stage (13th session): ending counseling	Approve the efforts and progress of patients, help patients deal with the complex mood (excitement, expectation, anxiousness, fear) after counseling discontinuation, and remind patients to apply above techniques in daily life.

Circular questioning, feed-forward questioning, differentiated questioning, and hypothetical questioning were used to understand the factors of the family affecting these patients. Active meaning and softening symptoms were employed to introduce new perspectives and measures to alter the feedback loop related to illness behaviors, which emphasized the reconstruction of the mode of interaction among family members, including the intrinsic explanation and behavior mode of family members and the family ideology; 2) homework was assigned between two therapeutic interviews, in which paradoxical intervention, role reversal, regular mailing or calling to other family members were used to help family members to create and consolidate good family rule and mode of interaction.

EPDS

EPDS was used to screen for postpartum depression.[16] The EPDS consists of 10 questions: state of mind, pleasure, self-accusation, anxiety, fear, insomnia, coping ability, sadness, crying and self-injury. Each item is scored on a four-point scale, and the sum of 10 items is the total score (0-30). The cutoff value is 12 for screening of postpartum depression. The higher the score, the more severe the depression.[23] Some studies have found that the Chinese edition of the EPDS has good reliability and validity in the screening of depression symptoms in women, and the cutoff value of 9/10 is superior to 12/13 in the diagnosis of depression.[16] In the present study, our screening of depression showed that the score of each item was relatively higher, and the cutoff value of 9/10 might thus increase the false-positive rate. Thus, the cutoff value of 12/13 was used in this study.

PSQI

PSQI was used to evaluate the quality of sleep within 1 month.[17] The PSQI consists of 23 questions, which are classified into seven factors. In the present study, none of the subjects were on hypnotic or sedative agents; thus, the corresponding factor was not included in evaluation. Each factor is graded on a four-point scale (0-3) and the sum of each factor is the total score of PSQI. The higher the score, the poorer the quality of sleep is. Generally, the cutoff value for the total score is 7. Sleep disorder is defined by a PSQI score higher than 7. In the present study, sleep latency was estimated according to the results in factor 2. Sleep duration was estimated with the score of factor 4. Waking after sleep onset was assessed according to the patients' complaints.

Procedures for evaluation

Both scales were used to evaluate depression and quality of sleep independently before study, at the end of intervention, and 6, 12, 18, and 24 months after delivery. Evaluation was done by experienced psychologists.

Subjects completed the questionnaire independently. They could ask the psychologists for help if they had problems completing the questionnaire, but suggestion was prohibited.

Evaluation

The EPDS and PSQI scores were used to evaluate the severity of depression and the quality of sleep respectively. Reductions in EPDS and PSQI scores compared to baseline were used to assess the extent of improvement of depression and quality of sleep.

Statistical analysis

Statistical analysis was done with SPSS version 16.0. An independent *t*-test was employed to compare the quantitative data between the two groups and the chi-square test was used to evaluate the difference in qualitative data between the two groups.

Results

EPDS and PSQI scores before and after intervention

Before intervention, there were no marked differences in the EPDS score and PSQI score between the two groups. After intervention, the EPDS scores, PSQI scores, and scores for each domain were significantly lower in the psychotherapy group than in the control group (Table 2).

Reduction in EPDS score and PSQI score at different time points in the study groups

From the end of intervention to 24 months after delivery, a total of five follow-up visits were conducted. Results showed that EPDS score and PSQI scores in each group had tended to reduce as compared with pre-intervention scores, and that the reduction in the psychotherapy group was significantly higher than that observed in the control group (Table 3).

Sleep latency, sleep duration, and waking after sleep onset at different time points after delivery

Before intervention, there were no marked differences in sleep latency, sleep duration, and waking after sleep onset between the study groups. At different stages after intervention, sleep latency and waking after sleep onset were markedly reduced in the psychotherapy group, and sleep duration increased significantly when compared with the control group (Table 4).

Discussion

Our results showed that CBT in combination with SFT for 3 months can improve symptoms of depression and quality of sleep in women with mild to moderate postpartum depression. This may be attributed to rectification of negative cognition and improvement of family relationships, thus enhancing family support.

Table 2 EPDS score and PSQI score before and after intervention in the psychotherapy and control groups

	Before				After			
Tools	Therapy (n=104)	Control (n=109)	*t*-test	p-value	Therapy (n=104)	Control (n=109)	*t*-test	p-value
EPDS	16.7±1.9	17.1±1.6	-1.45	0.149	13.3±2.9	15.6±3.5	-5.40	< 0.001
PSQI								
Subjective sleep quality	2.4±0.6	2.4±0.6	-0.13	0.900	1.8±0.7	2.2±0.8	-3.86	< 0.001
Sleep latency	1.9±0.9	2.1±0.7	-1.61	0.110	1.4±0.9	2.1±0.8	-5.91	< 0.001
Sleep duration	2.3±0.7	2.4±0.6	-0.43	0.670	1.8±0.8	2.1±0.8	-2.86	0.005
Habitual sleep efficiency	2.5±0.6	2.6±0.6	-1.41	0.161	1.6±0.8	2.2±0.9	-5.26	< 0.001
Sleep disturbance	1.3±0.5	1.4±0.5	-1.71	0.089	1.2±0.5	1.5±0.5	-4.13	< 0.001
Daytime dysfunction	2.7±0.5	2.6±0.5	0.68	0.496	1.8±0.7	2.2±0.8	-4.18	< 0.001
Total	13.3±2.7	13.2±2.6	0.19	0.848	9.5±3.7	12.1±4.1	-4.80	< 0.001

EPDS = Edinburgh Postnatal Depression Scale; PSQI = Pittsburgh Sleep Quality Index.

Table 3 Extent of reduction in EPDS score and PSQI score in the psychotherapy and control groups

	EPDS			PSQI		
Time point	Therapy (n=104)	Control (n=109)	*t*-test	Therapy (n=104)	Control (n=109)	*t*-test
Immediately after intervention	21.5±10.7	9.0±16.8	6.49	30.0±19.2	8.6±27.5	6.63
6 months after delivery	31.6±10.6	20.2±16.7	5.96	38.4±18.9	14.4±29.3	7.13
12 months after delivery	40.8±8.6	26.5±15.4	8.37	45.8±15.0	18.9±24.9	9.61
18 months after delivery	45.3±9.3	30.6±14.1	9.09	54.9±15.0	29.9±24.4	9.03
24 months after delivery	42.0±13.3	28.7±16.3	6.49	50.4±20.0	23.9±28.1	7.94

EPDS = Edinburgh Postnatal Depression Scale; PSQI = Pittsburgh Sleep Quality Index.
$p < 0.01$ for each.

Table 4 Sleep latency, sleep duration, and waking after sleep onset in the psychotherapy and control groups at different time points after delivery

Time point	Sleep latency (min)				Sleep duration (h)				Waking after sleep onset			
	Therapy (n=104)	Control (n=109)	*t*-test	p-value	Therapy (n=104)	Control (n=109)	*t*-test	p-value	Therapy (n=104)	Control (n=109)	*t*-test	p-value
Before intervention	34.8±19.0	38.7±16.0	-1.62	0.107	5.0±0.9	5.0±0.8	0.14	0.889	5.8±1.5	6.1±1.4	-1.57	0.120
Immediately after intervention	26.2±18.6	38.4±17.3	-4.97	< 0.001	5.6±0.8	5.3±0.8	2.57	0.011	4.6±1.7	5.1±2.0	-2.04	0.042
6 months after delivery	22.4±18.2	35.1±17.3	-5.19	< < 0.001	5.7±0.8	5.4±0.9	3.06	0.003	3.8±1.4	4.4±2.0	-2.76	0.006
12 months after delivery	20.3±17.6	32.1±15.5	-5.20	< < 0.001	6.2±0.6	5.7±0.8	5.29	< 0.001	2.9±1.0	3.8±1.9	-4.32	< 0.001
18 months after delivery	16.0±13.4	28.2±13.7	-6.55	< < 0.001	6.5±0.5	6.0±0.8	6.00	< < 0.001	2.3±0.8	3.2±1.7	-5.06	< < 0.001
24 months after delivery	20.8±12.2	34.6±14.9	-7.39	< 0.001	6.1±0.6	5.6±0.7	5.50	< 0.001	1.7±1.0	2.8±1.6	-6.14	< 0.001

Negative thought,[24] poor family relationship, and insufficient social support are major risk factors for postpartum depression.[15,25] CBT can rectify negative cognition and help subjects adapt to their role transformation and improve their parenting skills. In addition, CBT helps subjects face problems and strengthen their confidence to deal with problems in life. SFT can remove misunderstandings and improve understanding among family members, which then enhances mutual support and improves depression.[26] There are several pathways through which family support can affect psychological wellbeing. Members of a family may exert a salutary influence on mental health by providing normative guidance about health-relevant behaviors.[27] Integration in a family network may also directly produce positive psychological states, including a sense of purpose, belonging, and recognition of self-worth.[28] These positive states, in turn, may benefit mental health due to an increased motivation for self-care, as well as modulation of the neuroendocrine response to stress.[28]

Our results showed that reductions in EPDS and PSQI scores after psychotherapy were significantly higher than in the control group at five different time points after intervention. In addition, the quality of sleep (sleep latency, sleep duration, and waking after sleep onset) was also superior to that observed in the control group. Of note, the reduction seen 24 months after delivery was lower than that seen at 18 months, and sleep latency increased markedly. This suggests that: 1) depression in the psychotherapy group improved from the end of intervention to 24 months after delivery when compared with that in the control group; the quality of sleep in the psychotherapy group was superior to that in the control group (i.e., psychological intervention could improve the symptoms of depression within 19 months, which is consistent with previous reports[29,30]); 2) from 42 days to 18 months after delivery, depression in the control group was also attenuated; this may be attributed to the self-healing tendency of postpartum depression[31] and to the gradual regularity of the child's life and the gradual stability of the child's health; and 3) 24 months after delivery, depression deteriorated slightly and quality of sleep was reduced to a certain extent; this might be related to the fact that children are entering the first rebellious phase or ''terrible twos'' at this stage, leading to an increase in behavioral problems and in difficulties during parenting.

In the present study, we investigated the effects of CBT in combination with SFT on psychosomatic symptoms (symptoms of depression and quality of sleep) in women with mild to moderate postpartum depression, with a follow-up period of 2 years. Of note, this was a single-center study and patients were recruited from only one clinic. These limitations may affect the generalizability of our results. In addition, the influence of psychotherapy on postpartum depression and its potential mechanisms, how to apply psychotherapy, cautions in the application of psychotherapy, and the influence of psychological intervention on the physiology, psychology, and social function of mothers and infants are largely unclear.

Thus, further multicenter studies with large sample sizes are required to elucidate these issues.

Moreover, CBT and SFT are two effective strategies for the psychotherapy of depression. The present study employed a single control group. Future studies should use a CBT group, an SFT group, a CBT+SFT group, and a control group to confirm whether monotherapy is superior to combined therapy, as any difference may be clinically important.

Disclosure

The authors report no conflicts of interest.

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