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Clinical Study

Clinical observation of moving cupping on the back for patients with chronic fatigue syndrome-related sleep disorders

背部走罐治疗慢性疲劳综合征睡眠障碍的临床观察

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Abstract

Objective: To observe the clinical efficacy of moving cupping on the back for patients with chronic fatigue syndrome (CFS)-related sleep disorders.

Methods: A total of 60 patients with CFS-related sleep disorders were randomized into a control group and an observation group, with 30 cases in each group. The control group was treated with oral administration of fluoxetine hydrochloride capsule. The observation group was treated with moving cupping on the back, once every other day. The efficacy was observed after 4 weeks of treatment. The fatigue scale-14 (FS-14) and Pittsburgh sleep quality index (PSQI) were assessed before and after the treatment to evaluate the clinical efficacy.

Results: The total effective rate was 93.3% in the observation group, and 73.3% in the control group. The difference between the two groups was statistically significant (P<0.05). After treatment, the improvement of physical fatigue value, mental fatigue value, and the total score of FS-14 in the observation group were statistically different from those in the control group (all P<0.05). The scores of subjective sleep quality, sleep latency, habitual sleep efficiency, use of sleeping medication, daytime dysfunction of PSQI and the total score in the observation group were improved more significantly than those in the control group (all P<0.05).

Conclusion: Moving cupping on the back can significantly improve sleep disorders in CFS patients, and it has a better curative effect than oral fluoxetine hydrochloride capsules.

Keywords: Cupping Therapy; Moving Cupping Therapy; Fatigue Syndrome, Chronic; Insomnia; Governor Vessel; Bladder Meridian

【摘要】目的：观察背部走罐治疗慢性疲劳综合征(CFS)睡眠障碍的临床疗效。**方法：**将60例CFS伴睡眠障碍的患者随机分为对照组和观察组，每组30例。对照组给予盐酸氟西汀胶囊口服。观察组给予背部走罐治疗，隔日1次。治疗4周后观察疗效。治疗前及治疗后进行疲劳量表-14(FS-14)及匹兹堡睡眠质量指数量表(PSQI)评分，并判定临床疗效。**结果：**观察组总有效率为93.3%，对照组为73.3%，组间总有效率差异有统计学意义(P＜0.05)。治疗后，观察组躯体疲劳值、脑力疲劳值及FS-14总评分的改善情况优于对照组(均P＜0.05)。观察组PSQI量表中睡眠质量、入睡时间、睡眠效率、催眠药物和日间功能评分及PSQI总分的改善情况优于对照组(均P＜0.05)。**结论：**背部走罐能显著改善CFS睡眠障碍患者临床症状，疗效优于口服盐酸氟西汀胶囊。

【关键词】拔罐；走罐疗法；疲劳综合征，慢性；失眠症；督脉；膀胱经

【中图分类号】R244.3　　**【文献标志码】**A

Chronic fatigue syndrome (CFS) is a group of symptoms characterized by persistent or recurrent chronic fatigue[1]. Sleep disorders are the common accompanying symptoms of CFS[2]. The occurrence and development of sleep disorders can also induce or aggravate the symptoms of CFS, thus forming a vicious circle[3-5]. Behavioral cognitive therapy and graded exercise therapy have been proved safe and effective, but they are expensive and there are no enough professionals in this area[6]. The drugs currently used are symptom-oriented. This study applied moving cupping therapy to the back for CFS-related sleep disorders, and compared it with fluoxetine hydrochloride capsules.

1 Clinical Materials

1.1 Diagnostic criteria

This study referred to the CFS diagnostic criteria revised by the US Centers for Disease Control (CDC) in

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1994[7]. Excluding other diseases, fatigue lasted for more than 6 months, and at least four of the following symptoms presented: Difficulty with memory; unrefreshing sleep; sore throat; new headache; 24 h post-exertional malaise; tender lymph nodes; muscle pain; joint pain without redness and swelling.

1.2 Inclusion criteria

Those who aged 18-60 years old; met the diagnostic criteria; presented with obvious and persistent sleep disorder; agreed to participate in this clinical trial and signed informed consent.

1.3 Exclusion criteria

Those with organic or functional diseases characterized by chronic fatigue, such as diabetes, hypothyroidism; women during pregnancy or lactation; patients with severe cardiovascular, pulmonary or renal diseases.

1.4 Statistical method

All data were statistically analyzed by the SPSS version 20.0 statistical software. Chi-square test was applied to the comparison of counting data. Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s$). Paired sample *t*-test was applied to the comparison of intra-group data. Independent sample *t*-test was applied to the comparison between groups. $P<0.05$ was considered to indicate a statistically significant difference.

1.5 General data

A total of 60 patients with CFS-related sleeping disorder were enrolled from our hospital between February 2017 and September 2018. All patients were randomly divided into a control group and an observation group by the random number table, with 30 cases in each group. There was no drop-out case in any group during the trial. There were no significant differences in the general data between the two groups before treatment (all $P>0.05$), indicating that the two groups were comparable (Table 1).

Table 1. Comparison of general data between the two groups

Group	*n*	Gender (case)		Age (year)			Duration (month)		
		Male	Female	Youngest	Oldest	Average ($\bar{x} \pm s$)	Shortest	Longest	Average ($\bar{x} \pm s$)
Control	30	17	13	21	59	43.5±12.7	6	63	35.1±16.0
Observation	30	16	14	20	60	45.2±11.6	7	61	38.9±14.1

2 Treatment Methods

2.1 Control group

Oral fluoxetine hydrochloride capsules (Lilly Suzhou Pharmaceutical Co., Ltd., national drug registration number: J20080016), 20 mg once per day, continually taken for 4 weeks.

2.2 Observation group

The observation group was treated with moving cupping on the back (Figure 1).

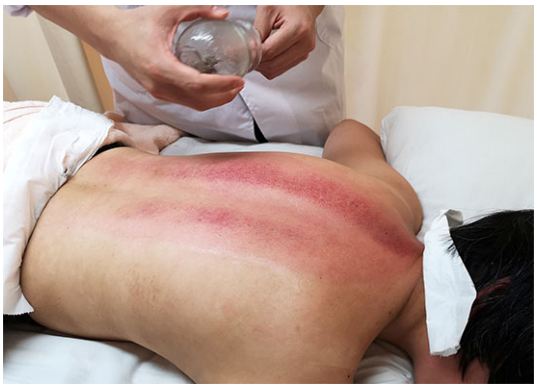

Figure 1. Moving cupping therapy

Body area for the moving cupping: Three lines on the back, along the Governor Vessel (GV) and bilateral Bladder Meridian (BL). The GV line was from Dazhui (GV 14) to Shiqizhui (EX-B 8), and the BL lines were from Dazhu (BL 11) to Guanyuanshu (BL 26).

Method: The patient took a prone position and relaxed. The physician stood on the left side of the patient and applied vaseline to the back of the patient. A size No. 4 cup was suctioned on the back skin using flash-fire cupping method. Then the physician held the cup, pushing it repeatedly along the three lines a bit forcefully to make the skin purplish red. Moving cupping therapy took 10-15 min each time, and was applied once every other day, for 4 weeks in total.

3 Observation of Curative Efficacy

3.1 Observation items

3.1.1 Fatigue scale-14 (FS-14)[8]

FS-14 was scored before and after treatment. The FS-14 scale includes 14 items, and each item is scored 0 or 1 point. Among them, 1-8 items are evaluated for physical fatigue, and 9-14 items are for assessing mental fatigue. The FS-14 scoring range is 0 to 14 points. The higher the score, the more severe the symptoms of CFS.

3.1.2 Pittsburgh sleep quality index (PSQI)[9]

PSQI was scored before and after treatment. The PSQI scale includes 7 items: subjective sleep quality,

sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Each item is scored 0 to 3 points, and the PSQI scoring range is 0 to 21 points. The higher the score, the more severe the symptoms of sleep disorders.

3.2 Criteria of curative efficacy

According to the *Guiding Principles for Clinical Study of New Chinese Medicines*[10], the reduction rate of PSQI score was used as the criteria of efficacy evaluation.

PSQI reduction rate = (Total score of PSQI before treatment – Total score of PSQI after treatment) ÷ Total score of PSQI before treatment × 100%.

Cure: The main symptoms basically disappeared. PSQI reduction rate ≥90%.

Marked effect: The main symptoms were significantly improved. PSQI reduction rate ≥60%, but <90%.

Effective: The main symptoms were improved. PSQI reduction rate ≥30%, but <60%.

Invalid: The main symptoms were not obviously improved or even worse. PSQI reduction rate <30%.

3.3 Results

3.3.1 Comparison of clinical efficacy

After treatment, the total effective rate of the observation group was significantly higher than that of the control group (χ^2 =4.32, *P*=0.037), (Table 2).

3.3.2 Comparison of FS-14 score

There were no significant differences in the value of physical fatigue, mental fatigue and total score of FS-14 between the two groups before treatment (all *P*>0.05). After treatment, the value of physical fatigue, mental fatigue and total score of FS-14 of both groups decreased significantly (all *P*<0.05). After treatment, the value of physical fatigue, mental fatigue and total score of FS-14 in the observation group were lower than those in the control group, and the differences were statistically significant (all *P*<0.05), (Table 3).

Table 2. Comparison of clinical efficacy between the two groups (case)

Group	*n*	Cure	Marked effect	Effective	Invalid	Total effective rate (%)
Control	30	1	8	13	8	73.3
Observation	30	6	7	15	2	93.3[1)]

Note: Compared with the control group, 1) *P*<0.05

Table 3. Comparison of FS-14 score between the two groups ($\bar{x}$ ±*s*, point)

Group	*n*	Time	Value of physical fatigue	Value of mental fatigue	Total score of FS-14
Control	30	Before treatment	5.63±1.59	4.17±1.26	9.80±2.20
		After treatment	3.73±1.46[1)]	2.97±1.54[1)]	6.70±2.04[1)]
Observation	30	Before treatment	5.37±2.13	3.87±1.36	9.23±2.64
		After treatment	1.93±1.68[1)2)]	2.17±1.44[1)2)]	4.10±1.84[1)2)]

Note: Compared with the same group before treatment, 1) *P*<0.05; compared with the control group after treatment, 2) *P*<0.05

3.3.3 Comparison of PSQI score

There were no significant differences in the 7 items of PSQI scale and the total score between the two groups before treatment (all *P*>0.05). After treatment, the scores of sleeping duration, use of sleeping medication and total score of PSQI in the control group were significantly decreased (all *P*<0.05), while there were no significant differences in the scores of subjective sleep quality, sleep latency, habitual sleep efficiency, sleep disturbances and daytime dysfunction (all *P*>0.05). After treatment, the scores of the 7 items of PSQI scale and the total score in the observation group were significantly decreased (all *P*<0.05). After treatment, the improvements of subjective sleep quality, sleep latency, habitual sleep efficiency, use of sleeping medication, daytime dysfunction and total score of PSQI in the observation group were more significant than those in the control group, and the differences between the two groups were statistically significant (all *P*<0.05), while there were no significant differences in the scores of sleeping duration and sleep disturbances between the two groups (both *P*>0.05), (Table 4).

3.3.4 Use of sleeping medication in the two groups

During the treatment, a total of 16 patients in the observation group took various sleeping medications. All these 16 patients took sleeping pills once in the initial stage of the trial, but no more afterwards. A total of 20 patients in the control group took sleeping medication. 9 of them took sleeping pills once in the initial stage of the trial, 7 took sleeping pills 2 to 4 times during the trial, and 4 took more than 5 times during the trial.

Table 4. Comparison of PSQI scores between the two groups ($\bar{x}$ ±*s*, point)

Group	*n*	Time	Subjective sleep quality	Sleep latency	Sleep duration	Habitual sleep efficiency	Sleep disturbances	Use of sleeping medication	Daytime dysfunction	Total score of PSQI
Control	30	BT	1.93±0.83	1.83±0.83	1.87±0.70	1.90±0.84	1.90±0.76	1.87±0.78	1.93±0.78	13.23±1.96
		AT	1.60±1.07	1.40±1.16	1.27±1.25[1)]	1.63±1.10	1.67±1.09	1.17±1.05[1)]	1.73±1.11	10.47±3.51[1)]
Observation	30	BT	1.97±0.89	2.00±0.87	1.70±0.84	2.07±0.74	2.00±0.87	1.73±0.74	2.07±0.78	13.53±2.05
		AT	0.87±0.94[1)2)]	0.77±0.82[1)2)]	1.10±0.84[1)]	0.77±0.77[1)2)]	1.17±0.83[1)]	0.53±0.51[1)2)]	0.97±0.89[1)2)]	6.17±2.12[1)2)]

Note: BT=Before treatment; AT=After treatment; compared with the same group before treatment, 1) $P<0.05$; compared with the control group after treatment, 2) $P<0.05$

4 Discussion

CFS is a Western medical term with no equivalent name in traditional Chinese medicine. According to the clinical manifestation of CFS-related sleep disorders, it falls under the category of consumptive disease and sleeplessness in Chinese medicine[11]. The onset of CFS is related to the dysfunctions of the spleen, liver, kidney and lung. The pathogenesis of the disease is mainly deficiency, or deficiency combined with excess, while excess alone is rare. Here, deficiency mainly refers to deficiency of qi, blood yin; excess mainly refers to qi stagnation, phlegm-dampness, and blood stasis. There is no consensus regarding the TCM pattern[12]. Peng M, *et al*[13] reviewed and analyzed literatures, and found that common patterns include deficiency of the heart and spleen, liver stagnation with spleen deficiency, yin deficiency of the liver and kidney, liver qi stagnation and qi deficiency of the spleen and stomach.

Moving cupping therapy belongs to the external treatment of traditional Chinese medicine and has been increasingly applied in treating suboptimal health conditions such as CFS and insomnia in recent years[14]. This therapy can relax sinews, activate collaterals, disperse stagnation, and eliminate stasis, dampness, and cold[15-16]. From the view of modern medicine, moving cupping therapy can expand capillaries and improve brain blood supply, and promote the dynamic balance of cerebral cortex excitation and inhibition[17]. In addition, the static blood and self-hemolysis caused by moving cupping can induce the self-immune response and boost immunity[18].

Moving cupping therapy is usually applied to the back along the GV and BL in treating CFS-related sleep disorders. GV is the sea of yang meridians and governs yang of the whole body. It is directly related to the brain. Therefore, stimulating GV through moving cupping can regulate yang qi of the whole body, balance yin and yang, inspire meridian qi to the brain, and regulate brain functions[19]. BL is the leader of the six meridians, which ascends to the head and face and connects with other meridians. CFS can present many symptoms, including physical and brain fatigue, which corresponds to the pathway of BL. The BL is connected with Zang-fu organs via Back-Shu points, therefore, moving cupping can stimulate the meridian qi and regulate qi and blood of the Zang-fu organs all over the body[20], thus harmonize the five Zang organs and unblock the meridians and collaterals.

In this study, moving cupping on the back for CFS-related sleep disorders had a significantly higher total effective rate than oral fluoxetine hydrochloride capsules. Compared with oral fluoxetine hydrochloride capsules, the effects of moving cupping on the back in improving physical fatigue, mental fatigue and the total FS-14 score were more significant. Moving cupping on the back had more obvious effects in improving the 7 items of PSQI and the total score than oral administration of fluoxetine hydrochloride capsules, especially the scores of subjective sleep quality, sleep latency, habitual sleep efficiency, use of sleeping medication and daytime dysfunction. All these results suggested that moving cupping on the back could significantly improve the clinical symptoms of patients with CFS sleep disorders, and it is worth promoting in clinic.

However, the sample size of this study was small, the treatment and observation period were short, and the observation items did not involve mechanism study. Therefore, multi-center, large-sample, and high-quality clinical research should be conducted in the future, with long-term efficacy observation and follow-up. Moreover, the mechanism of moving cupping therapy should be further explored to provide accurate and reliable clinical and theoretical basis for using moving cupping on the back to treat CFS-related sleep disorders.

Conflict of Interest

The author declared that there was no potential conflict of interest in this article.

Statement of Informed Consent

Informed consent was obtained from the recruited patients in this study.

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