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# **Clinical Study**

# Efficacy observation on acupuncture plus moving cupping with compound white mustard oil for lumbar myofascitis

# 针刺结合复方白芥子油走罐治疗腰背肌筋膜炎疗效观察

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# Abstract

**Objective:** To observe the clinical effect of acupuncture plus moving cupping with white mustard oil to treat lumbar myofascitis.

**Methods:** A total of 90 patients with lumbar myofascitis who met the inclusion criteria were randomly divided into an observation group and a control group, 45 cases in each group. The observation group received acupuncture and moving cupping with white mustard oil; the control group received acupuncture plus warm needling treatment. The treatment was given twice a week for a total of 4 weeks. The visual analog scale (VAS) and Chinese version of Roland-Morris disability questionnaire (RMDQ) score of pain before the treatment, and respectively after 1-week and 4-week treatment were recorded for efficacy evaluation.

**Results:** After 4 weeks of treatment, the difference in total effective rate between the two groups was not significantly (P>0.05). After 1 week of treatment, there was no significant difference in VAS score between the two groups (P>0.05). After 4 weeks of treatment, the VAS score of the observation group was lower than that of the control group, and there was a significant difference between the two groups (P<0.05). After 4 weeks of treatment, the Chinese version of RMDQ scores of both groups were significantly decreased, there were statistical differences in comparing with those before treatment (both P<0.05). After treatment for 1 week and 4 weeks, the Chinese version of RMDQ score in the observation group was lower than that in the control group, with significant differences between the two groups (and P<0.05).

**Conclusion:** Acupuncture plus moving cupping and acupuncture plus warm needling both can relieve the pain of patients with lumbar myofascitis, improve the function of back muscles, while the curative effect of acupuncture plus moving cupping is better.

**Keywords:** Acupuncture Therapy; Warm Needling Therapy; Moving Cupping Therapy; Myofascial Pain Syndromes; Back Pain; Pain Measurement

【摘要】目的:观察针刺结合复方白芥子油走罐治疗腰背肌筋膜炎的临床疗效。方法:将90例符合纳入标准的腰背肌筋膜炎患者随机分为观察组和对照组,每组45例。观察组接受针刺和白芥子油走罐治疗;对照组接受针刺加温针治疗。每星期治疗2次,共治疗4星期。分别在治疗前、治疗1星期及4星期后进行疼痛的视觉模拟量表(VAS)和中文版罗兰-莫里斯残疾问卷(RMDQ)评分,治疗结束后进行疗效评定。结果:治疗4星期后两组总有效率无统计学差异(P>0.05)。治疗1星期后,两组VAS评分无统计学差异(P>0.05);治疗4星期后,观察组的VAS评分低于对照组,组间差异有统计学意义(P<0.05)。治疗4星期后两组中文版RMDQ评分均明显降低,与本组治疗前均有统计学差异(均P<0.05)。治疗1星期和4星期后,观察组中文版RMDQ评分均低于对照组,组间差异均有统计学意义(均P<0.05)。结论:针刺加走罐及针刺加温针均可减轻腰背肌筋膜炎患者的疼痛,改善腰背肌功能,而针刺加走罐疗效更佳。

【关键词】针刺疗法;温针疗法;走罐疗法;肌筋膜疼痛综合征;背痛;疼痛测评

# 【中图分类号】R246.2 【文献标志码】A

Lumbar myofascitis, also known as myofascial pain syndrome (MPS) is a common clinical condition and the

**Corresponding Author**: Wang Wen-li, M.M., attending physician. E-mail: gracewwl@163.com diffuse dull pain, localized pain, coldness, skin numbness, muscle spasms and impaired movement. The pain is worse in the morning, mild during the day and aggravated in the evening. The pain is often triggered by physical inactivity or too much activity. This

main course of low back pain. It is characterized by

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condition has a long duration and is often triggered by fatigue or weather changes. It can affect the patients' quality of life. It is pathologically featured by chronic soft tissue pain in multiple myofascial trigger points<sup>[1-2]</sup>. Pressing these trigger points may produce referred pain.

The concept of trigger point was first proposed by Travell JG<sup>[3]</sup> in 1952. Till 1981, Simons DG, et al<sup>[4-5]</sup> confirmed the existence of trigger point and proposed the diagnosis of MPS in 1990. Modern Chinese scholars did some research on the mechanism of fasciitis. Wang YS, et al<sup>[6]</sup> held that release of 5-HT and histamine caused by soft tissue injury can produce ischemia and neurological sensitization, consequently resulting in shortening of muscle fibers, and inflammatory pain and the corresponding clinical symptoms. According to clinical data, Zhou XG, et al<sup>[7]</sup> found that myofascitis is closely related to work and lifestyle. It is more common in long-term desk work groups (such as teachers, accountants, designers and engineers). The body maintaining a fixed position for a long time will keep the back muscles in a continuous state of high tension, and it will make the muscles release inflammatory substances, causing ion imbalances. For example, hightension muscles will over-release calcium. High concentrations of calcium ions will in turn lead to sustained muscle contraction. When muscle pressure continues to rise, interstitial vessels are compressed, blocking the blood circulation and increasing tissue ischemia. Finally, there forms up a vicious cycle of pain-contraction-aggravated pain<sup>[8]</sup>.

In order to explore an effective treatment of lumbar myofascitis, this research was to observe the clinical effect of acupuncture plus moving cupping with white mustard oil in treating lumbar myofascitis, and the report is given as follows.

# **1** Clinical Materials

# 1.1 Diagnostic criteria

The diagnostic criteria were according to the diagnosis of lumbar myofascitis in *Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine*<sup>[1]</sup>: trauma after improper treatment, a history of strain or exposure to cold; more in the elderly, especially manual labors; back pain, stiff muscle, a weight-bearing sensation, often associated with weather changes, e.g. overcast and rainy weather may aggravate the symptoms; the back with a fixed tenderness or extensive tender points; back muscle stiffness, and nodule-like changes often can be palpated, along the lines of the sacrospinalis, with limited range of motion of the back; no positive findings by X-ray.

#### 1.2 Inclusion criteria

Conforming to the above diagnostic criteria; over 18 years old; no abnormality in serum human leukocyte antigen B27 (HLA-B27) and four coagulation indicators,

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namely, prothrombin time (PT), activated partial thromboplastin time (APTT), thrombin time (TT), and fibrinogen (FIB) screening. All patients signed the informed consent.

### 1.3 Exclusion criteria

Those with severe life-threatening or infectious diseases; with abrasions and bleeding tendency; pregnant women or those who cannot tolerate acupuncture or moving cupping treatment; those with a history of lumbar surgery or severe lumbar deformity; those who can't understand the scales or judge their own degree of pain; those with fracture, osteoporosis, lumbar spinal stenosis, spondylolisthesis or spinal tumor or infections.

#### 1.4 Statistical methods

The SPSS 22.0 version software was used for statistical analysis. Chi-square test was adopted for gender data; age data in normal distribution with homogeneity of variance were expressed as mean  $\pm$  standard deviation ( $\bar{x}\pm s$ ), and analyzed by *t*-test. Visual analog scale (VAS) score and Chinese version of Roland-Morris disability questionnaire (RMDQ) were grading data, and were analyzed by rank-sum test. *P*<0.05 indicated a statistically significant difference.

### 1.5 General data

A total of 90 patients were enrolled in this study, and all visited Jiaxing Second Hospital of Zhejiang Province for low back pain between January 2016 and December 2016. According to the order of treatment, they were divided into an observation group and a control group, 45 cases in each group. There were no significant differences in gender and age between the two groups (both *P*>0.05), indicating the comparability between the two groups (Table 1).

0		Gend	er (case)	Average age		
Group	п	Male	Female	$(\overline{X} \pm s, year)$		
Observation	45	14	31	42.4±11.3		
Control	45	21 24		42.2±9.3		
Statistical value		2.	291 <sup>1)</sup>	0.343 <sup>2)</sup>		
P-value		0.	194	0.793		

Note: 1)  $x^2$  value; 2) *t*-value

# 2 Treatment Methods

#### 2.1 Observation group

#### 2.1.1 Acupuncture therapy

Points: Dazhui (GV 14), Yaoyangguan (GV 3), Ashi points and bilateral Weizhong (BL 40), Yanglingquan (GB 34) and Shenshu (BL 23).

Method: The tender points were found and taken as Ashi points. After routine disinfection, needles of 0.30 mm in diameter and 40 mm in length were selected to puncture. After arrival of qi, even reinforcing-reducing manipulation was conducted to make patients to feel soreness, numbness or distention. The needles were retained for 30 min.

### 2.1.2 Moving cupping method

Moving cupping was used after acupuncture therapy. Compound white mustard oil configuration: 40% mustard oil, 40% sesame oil, 10% wintergreen oil, and

turpentine 10%. Method: The patient was coated with white mustard oil on the back. The doctor took a special glass cup of a 45 mm in outer diameter, 38 mm in inner diameter of and 70 mm in depth, used flash-fire method to make the cup adsorb onto Dazhui (GV 14), and then moved the cup to slide down along the Governor Vessel [from Dazhui (GV 14) to Yaoyangguan (GV 3)], the first side line [from Dazhu (BL 11) to Qihaishu (BL 24)] and the second side line [from Fufen (BL 41) to Zhishi (BL 52)] of the Bladder Meridian, from top to bottom (single palm held the cup, made the cup body perpendicular to the skin, and pulled the cup to make it slide gently from top to bottom). Repeated the above operation until the local skin was significantly flushing or purple black petechia appeared.

# 2.2 Control group

Patients in the control group received acupuncture and warm needling moxibustion.

Points: Same as those used in the observation group.

Methods: The acupuncture method was same as that in the observation group. The moxa stick was cut into small segments of about 2.5 cm in length. Made a hole in the center with a cotton swab and then fixed one moxa segment onto the needle tail, and lit it from the bottom. A paper pad was placed on the skin to prevent burn by falling ash. Paramedics removed ash regularly during the treatment. Three segments for each point, totally lasting about 30 min.

The two groups were treated twice a week. The effect was observed after 4 weeks of treatment in both groups.

# **3** Observation of Efficacy

# 3.1 Observation items

Patients of the two groups were assessed with VAS and Chinese version of RMDQ before treatment, and respectively after 1-week and 4-week treatment.

# 3.1.1 VAS<sup>[8]</sup>

With a straight line of 10 cm in length, the leftmost mark is 0 cm and the rightmost mark is 10 cm, explained as that 0 cm means no pain, while 10 cm means severe unbearable pain. Patients were asked to point out his pain intensity on the line. The corresponding calibration line pointed by the patient was considered as the score of VAS. The scale must be determined by the patient himself and the researcher should not suspect or have any suggestive behaviors. 3.1.2 Chinese version of RMDQ<sup>[2]</sup>

There are 24 items in the Chinese version of RMDQ, including walking, standing, bending, work, bed rest, wearing clothes, and self-care ability in many aspects of daily life. Each question entry is calculated as 1 point. The answer to 'yes' is 1 point, and the answer to 'no' is 0 point. The total score is the sum of all points to 'yes'. The lowest score is 0 and the highest score is 24. The higher the score, the worse the dysfunction.

### 3.2 Criteria of therapeutic effect

The efficacy was evaluated according to the therapeutic effect criteria of PMS in the *Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine*<sup>[1]</sup>.

Cure: Back pain disappeared, mobility free, and no recurrence during the treatment.

Improvement: Back pain reduced, but a little discomfort during activity.

Failure: No improvement in symptoms.

# 3.3 Results

3.3.1 Clinical efficacy

After 4 weeks of treatment, the overall clinical efficacy of the two groups was compared using rank-sum test (Z=-3.715, P=0.000), suggesting that acupuncture plus moving cupping is better than acupuncture plus warm needling for PMS (Table 2).

# 3.3.2 VAS score

There was no significant difference in VAS score between the two groups before the treatment (P<0.05). After one week of treatment, the VAS scores of the two groups were lower than those before the treatment (both P<0.01), but there was no significant difference between the two groups (P>0.05). These results suggested that both treatment protocols were effective. After 4-week treatment, compared with those after 1-week treatment, the VAS scores of the two groups continued to decline, there were significant intra-group differences in the two groups (both P<0.01); the VAS score in the observation group was significantly lower than that in the control group (P<0.01). These results suggested that acupuncture plus moving cupping can relieve pain better than acupuncture plus warm needling (Table 3).

#### 3.3.3 Chinese version of RMDQ score

Before the treatment, the difference in Chinese version of RMDQ score between the two groups was not statistically significant according to rank-sum test (P>0.05). After 1-week treatment, the Chinese version of RMDQ scores of both groups were lower than those before the treatment (both P<0.01), but there was no significant difference between the two groups (P>0.05). These results suggested that both treatment protocols can improve patient's dysfunction. After 4 weeks of treatment, the Chinese version of RMDQ scores of both

groups continued to decline, with a statistical intragroup difference in each group compared with the score after 1-week treatment (both P<0.01). The Chinese version of RMDQ score in the observation group was significantly lower than that in the control group (P<0.05). These results suggested that acupuncture plus moving cupping can improve the dysfunction better than acupuncture plus warm needling (Table 4).

Table 2.	Comparison	of clinical	efficacy	between	the two	groups	(case)
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Group	n	Cure	Improvement	Failure	Cure rate (%)	Total effective rate (%)
Observation	45	25	16	4	55.6	91.1
Control	45	15	24	6	33.3	86.7

Table 3.	Comparisons	of VAS score	s before and a	fter the treatme	nt (average rank)
Table 5.	Comparisons	UI VIAS SCOLO	s beible and a	nut inc ircaime	it (aver age rank)

Group	п	Before treatment	After 1-week treatment	Z-value	P-value	After 4-week treatment	Z-value	P-value
Observation	45	43.80	42.86	-5.810	0.000	38.78	-5.824	0.000
Control	45	47.20	48.14	-5.850	0.000	52.22	-5.549	0.000
Z-value		0.622	-0.972			2.582		
P-value		0.537	0.333			0.005		

Table 4. Comparisons of (	Chinese version RMDQ	scores before and after	the treatment	(average rank
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Group	п	Before treatment	After 1-week treatment	Z-value	P-value	After 4-week treatment	Z-value	P-value
Observation	45	44.99	41.44	-5.849	0.000	38.86	-5.562	0.000
Control	45	46.01	49.56	-5.852	0.000	52.14	-5.760	0.000
Z-value		-0.186	-1.480			2.532		
P-value		0.854	0.140			0.011		

# 4 Discussion

Lumbar myofascitis falls under the category of 'Bi-impediment syndrome' and 'low back pain' in Chinese medicine. As far as internal factors are concerned, it is caused by deficiency of the liver and kidney and stagnation of qi and blood. As far as exogenous factors are concerned, it is caused by wind, cold and dampness or inappropriately treated or untreated traumatic injuries. Internal and external etiological factors either cause obstruction or malnourishment, both resulting in pain<sup>[9-10]</sup>.

Modern medicine considers that it is majorly caused by soft tissue strain of the back. The aseptic inflammation of the local soft tissue and the peripheral nerve micro-vascular permeability are the main pathological changes<sup>[11]</sup>. The main purpose of treatment is to relieve pain<sup>[12-15]</sup>. Acupuncture plus warm needling is a routine and effective method for myofascitis<sup>[16]</sup>. Moving cupping therapy, a TCM treatment, is based on the cupping therapy, a TCM treatment, is based on the cupping therapy<sup>[17]</sup>. Moving cupping method was first seen in an article entitled 'Cupping therapy' in 1956, which was published in *Shanghai Zhongyiyao Zazhi* (*Shanghai Journal of Traditional Chinese Medicine*)<sup>[18]</sup>, with the function of dilating local microvessels. Governor Vessel, the sea of yang, can unblock yang in the whole body; the Bladder Meridian, from top to bottom, can link the qi movements of Zang-fu organs. So, moving cupping along the Governor Vessel and Bladder Meridian pathways can induct yang to the surface of the human body, adjust qi movement, and improve human immunity<sup>[19]</sup>.

Ashi points can circulate the local qi and blood to stop pain. Weizhong (BL 40) is the He-Sea point of the Bladder Meridian, and belongs to the earth in five elements. The Bladder Meridian passes the back, so puncturing Weizhong (BL 40) can relax sinews and activate collaterals. Yanglingquan (GB 34), the tendon influential point of the Eight Influential Points, can fortify tendons and bones, dispel wind and resolve dampness. Shenshu (BL 23), as the Back-Shu point of the kidney, can tonify the liver and kidney, strengthen bones, and warm kidney to dispel cold; at the same time, as a local point, it can dredge the local gi and collaterals. blood, relax sinews and activate Yaoyangguan (GV 3) can strengthen tendons and bones, as well as dispel cold and dampness. Dazhui (GV 14) is a crossing point of all yang meridians, can dredge qi and unblock blood of the Governor Vessel, dispel cold and resolve dampness. To combine those points above can unlock the meridians and warm yang to relieve pain.

Bai Jie Zi (Semen Sinapis Albae) can warm the lung to resolve phlegm, regulate qi to resolve stasis, and dredge collaterals to kill pain. It is commonly used in treating cough and asthma due to cold and phlegm, chest and hypochondrium distention and fullness, joint numbness or pain caused by phlegm stagnation, or furuncle/mass due to phlegm and dampness<sup>[20-21]</sup>. White mustard oil can make the skin hot, and promote deep blood circulation, and has a strong anti-inflammatory analgesic effect<sup>[22]</sup>. Patients with back pain often have cold back feeling, and feel comfortable after treated with mustard oil. Wintergreen oil, also known as methyl salicylate, is good at releasing swelling to kill pain; turpentine can relax tendons<sup>[23-24]</sup>, dredge collaterals, and promote the penetration of salicylic acid<sup>[20]</sup>. The combination of the two has a better efficacy. Sesame oil plays a role in lubricating and protecting the skin.

From the results of this study, it was shown that after 1 week of treatment, the back pain of both groups was significantly relieved, and the functional improvement of the observation group was more significant than that of the control group. After 4 weeks of treatment, the improvements in pain and activity disorder in the observation group were more significant than those in the control group, and the recovery rate of the observation group was higher than that of the control group. Acupuncture plus moving cupping with white mustard oil has curative effect in treatment of lumbar myofascitis. It can relieve back pain and improve the activity of the back. Therefore, it can be used as a kind of simple and effective treatment for myofascitis.

#### **Conflict of Interest**

There was no potential conflict of interest in this article.

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#### Statement of Informed Consent

Informed consent was obtained from all individual participants in this study.

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