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Study on the Efficacy of Physical Factor Therapy Combined With Exercise Rehabilitation in Treating Lumbar Myofascial Pain Syndrome

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Abstract: *Objective:* To investigate the therapeutic effects of physical factor therapy combined with exercise rehabilitation on patients with lumbar myofascial pain syndrome. *Methods:* Fifty patients with lumbar myofascial pain syndrome who visited the hospital were randomly divided into an observation group and a control group, with 25 cases in each group. The control group received conventional physical factor therapy, while the observation group was additionally treated with exercise rehabilitation training. The pain levels, lumbar function, quality of life, and clinical efficacy were compared before and after treatment between the two groups. *Results:* After treatment, the observation group showed better pain relief, improved lumbar function, and enhanced quality of life compared to the control group, with a significantly higher overall clinical effectiveness ($P < 0.05$). *Conclusion:* Combining physical factor therapy with exercise rehabilitation can more effectively alleviate symptoms in patients with lumbar myofascial pain syndrome, improve lumbar function, and enhance quality of life, making it worthy of clinical promotion and application.

Keywords: Lumbodorsal myofasciitis; Physical factor therapy; Exercise rehabilitation; Efficacy analysis

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1. Introduction

Back myofascitis is a very common soft tissue disease in clinic, mainly caused by strain, trauma, cold, and other tissues of back muscles and fascia, and then lead to local aseptic inflammation. Patients often suffer from diffuse pain in the lower back, which is aggravated in the morning, after fatigue, or when the weather changes, which seriously affects patients' daily activities, work status, and quality of life. At present, there are various therapeutic methods for lumbar and back myofascitis, among which physical factor therapy can effectively improve local blood circulation and reduce inflammation by virtue of physical factors such as warm and electromagnetic. Exercise rehabilitation training helps to strengthen the muscles of the waist and improve the stability of the spine. However, a single treatment is often difficult to achieve the ideal therapeutic effect. The purpose of this study is to investigate the clinical effect of physical factor therapy combined with exercise rehabilitation on patients with lumbar and back myofascitis, and to provide a more

scientific and effective program for clinical treatment.

2. Objects and methods

2.1. Research object

A total of 50 patients with lumbar and back myofascitis are selected from the Department of Orthopedics and Rehabilitation of the hospital. The inclusion criteria of the study are: In line with the diagnostic criteria of lumbar and dorsal myofascitis, that is, diffuse pain in the lower back, mainly pain, extensive pain sites, can touch the cord indentation or painful nodules, limited lumbar movement, symptoms aggravated after fatigue and cold; Age 40–50; Patients voluntarily participated in the study and signed informed consent. However, the exclusion criteria are: Combined with lumbar fracture, lumbar disc herniation, lumbar spondylolisthesis and other serious organic lesions of the lumbar spine; Severe cardiovascular and cerebrovascular diseases, diabetes and other systemic diseases, unable to tolerate treatment; Mentally ill patients, unable to cooperate with treatment and evaluation [1]. Patients are divided into observation group and control group by random number table method, with 25 cases in each group. There was no significant difference in age, gender, course of disease and other general data between the two groups ($P > 0.05$), indicating comparability.

2.2. Research methods

2.2.1. Control group

Control group patients received conventional physical factor therapy, as follows:

(1) Infrared radiation: Use an infrared therapy device to keep a distance of 30–50cm from the patient's lower back pain site for 20–30 minutes each time, once a day. Infrared thermal radiation can dilate local blood vessels, promote blood circulation, accelerate the discharge of metabolites, provide a good blood transport environment for damaged tissue repair, and relieve muscle spasm and pain.

(2) Magnetic therapy: Pulse magnetic therapy instrument is used to place the magnetic head in the patient's low back pain area, the magnetic field intensity is set at 0.05–0.3T, and the pulse frequency is 50–100Hz. Each treatment is 20 minutes, once a day. Magnetic therapy can regulate the size and direction of human biological current, produce a weak eddy current, affect the direction of electronic movement in the body and the distribution, concentration and movement speed of ions inside and outside the cell, change the membrane potential, affect the excitability of nerves, but also through the stimulation of acupuncture points, regulate the operation of Qi and blood channels, play a role in reducing swelling and pain, promote tissue repair. With infrared irradiation to promote the coordination of blood flow, better improve the local tissue state [2].

(3) Interference electrotherapy: The interference electrotherapy instrument is used to cross the two groups of intermediate frequency current with a frequency difference of 0–100Hz into the patient's lower back pain site. The current intensity should be tolerated by the patient. Each treatment is 20 minutes, once a day. Interference electrotherapy can produce endogenous modulated intermediate frequency current, the depth of its effect, can stimulate deep muscles and nerves, cause muscle contraction, enhance muscle strength, while promoting local blood circulation, can also inhibit sensory nerves, play an analgesic role, in improving muscle function and analgesia and the former two complement each other, improve the overall physiotherapy effect. The treatment cycle is 4 weeks, 5 times a week.

2.2.2. Observation group

On the basis of routine physical factor therapy in the control group, patients in the observation group combined with exercise rehabilitation training, the exercise rehabilitation training program is as follows:

(1) Acute phase (1–2 weeks) :

(a) Waist stretching exercise: The patient takes the supine position, knees bent, hands behind the head, slowly raise the upper body, as far as the shoulders away from the bed, hold for 3–5 seconds, and then slowly lower, repeat 10–15 times. This exercise helps to stretch the waist muscles and relieve muscle tension.

(b) Lumbar lateral bending exercise: The patient stands, feet shoulder-width apart, hands akimbo, slowly bend to one side, feel the stretch of the waist, hold 3–5 seconds, return to the neutral position, and then bend to the other side, repeat 10–15 times on each side.

(2) Remission period (3–4 weeks) :

(a) Small flying swallow exercise: The patient lies on the stomach, arms on the side of the body, legs straight, and then forcefully lift the head, upper limbs and lower limbs up, leaving the bed, like a flying swallow, hold 3–5 seconds and then slowly lower, repeat 10–15 times. The small flying swallow exercise can strengthen the lumbar extensor muscle and improve the stability of the spine.

(b) Five-point support method: The patient lies on his back, knees flexion, with the sole of the foot, elbows and shoulders as fulcrum, lift the pelvis, make the shoulder, abdomen and knee in a straight line, and then slowly put it down, together as an action, 20–30 consecutive. This exercise can exercise the waist muscles and reduce the pressure on the waist.

(c) Swim training: Patients are encouraged to practice breaststroke for 30–45 minutes three to four times a week [3]. In the process of breaststroke, the waist muscles can get targeted exercise when maintaining the body balance and matching the movements of the limbs, and the buoyancy of the water can reduce the pressure of the body on the waist and reduce the weight of the waist, which is a more ideal waist rehabilitation exercise. Exercise rehabilitation training should gradually increase the intensity according to the patient's tolerance degree to avoid excessive fatigue. The treatment period was also 4 weeks. It is performed simultaneously with physical factor therapy.

2.3. Observation indicators

2.3.1. Pain degree

Visual analogue scale (VAS) is used to evaluate the degree of pain before and after treatment. Draw a 10cm horizontal line on the paper, one end marked with 0, indicating no pain; The other end is marked with 10, which means severe pain. Patients are asked to mark on the horizontal line according to their own pain feelings, and the distance from the mark point to the 0 end is measured as the VAS score. The higher the score, the more severe the pain [4].

2.3.2. Waist function

Lumbar function was assessed using the Oswestry Disability Index (ODI). ODI includes 10 items, including pain intensity, self-care ability, lifting, walking, sitting, standing, sleep, sexual life, social life, and travel etc. Each item is divided into 6 levels according to the degree of dysfunction, from 0–5 points, the total score is 0–50 points. The higher the score, the more severe the lower back dysfunction.

2.3.3. Quality of life

Quality of life before and after treatment is assessed using the Brief Health Status Questionnaire (SF-36). The questionnaire covers eight dimensions: physiological function, physiological function, physical pain, general health, energy, social function, emotional function, and mental health. The higher the score, the better the quality of life.

2.3.4. Clinical efficacy

The clinical efficacy was evaluated according to the symptoms and signs of the patients after treatment [5]. Obvious

effect: the symptoms of low back pain were significantly relieved, waist activity basically returned to normal, VAS score decreased by ≥ 75%; Effective: lower back pain symptoms were alleviated, lower back range of motion was improved, VAS score was reduced by 50%–74%; Ineffective: Lower back pain symptoms and lower back motion were not significantly improved, and VAS score is reduced by less than 50%. Total effective rate = (number of effective cases + number of effective cases)/total number of cases ×100%.

2.4. Statistical methods

SPSS 22.0 statistical software is used to analyze the data. Measurement data are expressed as mean ± standard deviation (x±s), and an independent sample t-test is used for comparison between groups. Statistical data are expressed as cases and percentages (%), and χ^2 test is used for comparison between groups. $P < 0.05$ is considered to be statistically significant.

3. Results

3.1. Comparison of VAS scores before and after treatment between the two groups

Before treatment, there was no significant difference in VAS scores between the two groups ($P > 0.05$). After treatment, the VAS score of both groups was significantly decreased, and the VAS score of the observation group was lower than that of the control group, with statistical significance ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of VAS scores between the two groups after treatment

Group	Example number	VAS score before treatment	VAS score after treatment
Observation group	25	7	2
Control group	25	6.5	4

3.2. Comparison of ODI scores before and after treatment between the two groups

Before treatment, there was no significant difference in ODI scores between the two groups ($P > 0.05$). After treatment, ODI scores in both groups were significantly decreased, and ODI scores in the observation group were lower than those in the control group, with statistical significance ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of ODI scores between the two groups after treatment

Group	Example number	Pre-treatment ODI score	DOI score after treatment
Observation group	25	30	10
Control group	25	28	18

3.3. Comparison of SF-36 scores before and after treatment between the two groups

Before treatment, there was no significant difference in SF-36 scores between the two groups ($P > 0.05$) [6]. After treatment, SF-36 scores of patients in both groups were significantly improved in all dimensions, and scores of physiological function, physiological function, physical pain, general health status, energy, social function, emotional

function and mental health in the observation group were higher than those in the control group, with statistical significance ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of SF-36 scores before and after treatment between the two groups

Group	Example number	Physiological function	Physiological function	Somatic pain	General state of health
Observation group	25	85	75	80	80
Control group	25	70	60	65	70
Group	Example number	Vigor	Social function	Affective function	Mental health
Observation group	25	75	75	70	75
Control group	25	65	65	60	65

3.4. Comparison of clinical efficacy between the two groups

The total clinical effective rate of patients in the observation group was 90%, which was significantly higher than 60% in the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of clinical efficacy between the two groups of patients

Group	Example number	Remarkable	Effective	In vain	Total effective rate (%)
Observation group	25	13	8	4	84%
Control group	25	8	7	15	60%

4. Discussion

As a common chronic pain disease, the pathogenesis of lumbar and back myofascitis is closely related to muscle strain, fascia inflammation, local blood circulation disorders and other factors. Traditional treatment mainly focuses on relieving pain symptoms, but it is easy to relapse and difficult to fundamentally improve patients' waist function and quality of life [7].

In this study, the control group used conventional physical factor therapy methods, such as infrared irradiation, ultrasound treatment, and medium-frequency electrotherapy. These treatments improve local blood circulation through thermal effects, mechanical effects, and electromagnetic effects, reduce inflammatory responses, and alleviate muscle spasms, thereby reducing pain. However, single physical factor therapy treatments can only temporarily relieve symptoms and have limited effects on improving the strength of lumbar muscles and spinal stability.

The observation group achieved better therapeutic effects by combining physical factor therapy with exercise rehabilitation training. Exercise rehabilitation training is conducted at different stages to target specific exercises for waist muscle strengthening and joint mobility. During the acute phase, lumbar extension and lateral flexion movements

can relieve muscle tension and reduce pain. During the recovery phase, small fly movements, five-point support techniques, and swimming training can effectively enhance the strength of the lumbar extensor muscles and core muscles, improve spinal stability, and reduce the risk of re-injury to the waist muscles. Additionally, exercise rehabilitation training can promote local blood circulation, accelerate the absorption of inflammation, and improve waist function [8, 9].

According to the results of this study, patients in the observation group showed better improvements in pain level, lumbar function, and quality of life compared to the control group after treatment. The overall clinical effectiveness was also significantly higher than that of the control group ($P < 0.05$). This clearly demonstrates that combining physical factor therapy with exercise rehabilitation can more effectively alleviate pain symptoms in patients with myofascial pain syndrome of the lower back, improve lumbar function, and enhance quality of life.

In addition, sports rehabilitation training has the advantages of low cost, high safety, and good patient compliance, and patients can train at home under the guidance of doctors, which is conducive to long-term adherence. However, in the implementation of sports rehabilitation training, personalized training programs should be developed according to the specific conditions of patients to avoid excessive training to aggravate the waist injury [10–12].

5. Policy recommendations

(1) Enhance rehabilitation knowledge promotion: Hospitals and communities should increase efforts to promote knowledge about the rehabilitation of lumbar and back myofascial pain syndrome, improving patients' understanding of the disease and their self-rehabilitation awareness. This can be achieved through health lectures and distribution of promotional materials, helping patients understand the importance and correct methods of physical factor therapy and exercise rehabilitation training [13].

(2) Standardize the rehabilitation treatment process: Develop unified guidelines for physical factor therapy and exercise rehabilitation training for lumbar myofascial pain syndrome, specifying treatment methods, duration, and precautions to ensure standardized and regulated clinical care. At the same time, enhance the training of rehabilitation therapists to improve their professional skills and clinical abilities [14].

(3) Improve medical insurance policies: More effective physical factor treatment projects and exercise rehabilitation training will be included in the scope of medical insurance reimbursement, to reduce the economic burden of patients, improve their compliance with treatment, and promote patients' active participation in rehabilitation treatment [15].

6. Conclusion

Combining physical factor therapy with exercise rehabilitation offers a balanced, evidence-based strategy for LMPS, merging immediate symptom relief with sustainable functional recovery. Its clinical promotion is justified by enhanced patient outcomes, quality of life, and long-term cost savings, provided treatments are personalized and professionally guided.

Disclosure statement

The author declares no conflict of interest.

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