Research status of traditional Chinese medicine and physiotherapy for lumbodorsal myofascitis in badminton

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Abstract. Lumbodorsal myofasciitis is a common injury in badminton and a common disease in clinical practice. Clinically, acupuncture, cupping, massage, extracorporeal shock wave and other methods are usually used. This paper summarizes and classifies the commonly used treatment methods in the clinic, which are mainly divided into traditional Chinese medicine (TCM) combined treatment methods, Chinese medicine treatment combined physical therapy methods and physical combined therapy. In the clinic, TCM combined treatment methods and TCM combined physical therapy methods are mainly used, and TCM combined physical therapy methods should be the main research direction in the future. There are many therapeutic methods, but the efficacy of combining multiple therapeutic methods is better than that of single method. This study can provide a theoretical basis and reference for subsequent research and clinical treatment.

1. Introduction
Badminton is a sport with a high rate of injuries and there is little difference in the incidence of injuries between professional athletes and amateurs [1]. Among them, lumbodorsal myofasciitis is one of the injuries with high prevalence, so its treatment is extremely important. In the treatment of lumbodorsal myofasciitis, the main use of TCM and physical therapy are two non-surgical treatments, which have different efficacies and precise therapeutic effects. This paper compares and analyzes the TCM and physical therapy methods to provide a theoretical basis and reference for related research.

2. Introduction and incidence of lumbodorsal myofasciitis injury in badminton sports
Acute injuries and chronic strain injuries are common in badminton with high lumbar mobility and much extension and flexion and twisting [2]. Repetitive overflexion, hyperextension, and lateral flexion movements result in the lower back being susceptible to injury. This paper searches the relevant literature on badminton injury in CNKI in the past ten years, and finds that the prevalence of low back injury in badminton is very high, whether among amateurs or professional athletes.

Although professional athletes are far superior to amateurs in terms of physical fitness and technique, their incidence of injury is also significantly higher than that of amateurs [6]. Injuries occurring in professional athletes are mainly overwork injuries caused by high training load intensity [6]. In Li Chunlei's [4] statistics on the injuries of the Chinese national badminton team, low back injuries were the most frequent, accounting for 39%. Related studies show that the incidence of lumbar injuries is the highest, in which some studies show that the prevalence of lumbodorsal myofasciitis is the highest, in the survey of Chen Yang et al [3] the prevalence of lumbar injuries in Chinese domestic badminton players is 53.6%, in which the prevalence of lumbodorsal myofasciitis and intervertebral disc herniation is highest at 38.0% and 35.1%, respectively. Some studies have shown that lumbar strain is the highest percentage of low back injuries, but the prevalence of lumbodorsal myofasciitis is second only to lumbar strain and ranks second in the prevalence of all types of trauma in their survey [7].

Unstandardized technical movements, neglect of preparation and finishing activities are the main triggers of injury in amateurs [6]. For example, the action of slamming the ball often need to rely on the waist and abdominal muscles to drive the upper limb rotation to complete, the sharp backward leaning over flexion lateral flexion action, will make the lumbar muscle force imbalance, which will lead to lumbar injuries, amateurs often don't have enough lumbar and abdominal strength, coupled with the non-standardized technical action, which is more prone to injuries. In the survey of amateur badminton players in Nanning City by Huang Yun et al [5], the lumbar back injury was the first one accounting for 45.2%, followed by the knee and foot accounting for 29.0% and 30.6% respectively. The prevalence of badminton sports trauma in “Practical Sports Medicine” [2] also had the highest prevalence of lumbodorsal myofasciitis at 17.24%.
3. Overview of non-surgical treatments for lumbodorsal myofasciitis injuries

In clinical treatment, whether it is traditional Chinese medicine or physical therapy, a variety of therapies will be chosen to cooperate with the treatment in order to obtain better therapeutic effects. For example, cupping therapy is often combined with TCM therapies such as acupuncture, massage and internal and external application of TCM to treat various diseases [8]. The combination of physical therapy and Chinese medicine therapy also has a variety of ways of cooperation, such as extracorporeal shock wave technology with acupuncture, Chinese medicine ion implantation combined with ultrashort wave, SNAG technology combined with acupuncture, and so on. In this paper, the therapeutic effects of different therapies for the treatment of lumbodorsal myofasciitis are sorted out and analyzed.

3.1 Combined treatment methods of traditional Chinese medicine

Traditional Chinese medicine treatment methods are mainly based on acupuncture, cupping, massage, etc. Traditional Chinese medicine has been handed down to the present day, there are many therapies, and there are also different methods in different therapies, for example, there are different needles in acupuncture such as plum blossom needle, three-edged needle, acupuncture point embedded wire method, electroacupuncture and so on, and there are also different schools and techniques in massage, and there are many different ways of combined treatment. Individual therapies have their effects, but a combination of them can make the treatment more effective.

3.1.1 Acupuncture combined with cupping

Acupuncture therapy has a long history and is a simple and efficient therapy in clinic, and there are many classifications, such as He Gu needle technique, fire needle, electroacupuncture, endothermic needle and so on, which can be used for the treatment of dorsal myofasciitis in clinic [9]. Cupping therapy has a long history, first seen in the "52 Diseases Formula", has the effect of activating blood circulation, relieving pain and swelling, and removing dampness. The combination of the two is a commonly used method for the treatment of lumbodorsal myofasciitis in clinical practice. Xu Xujie et al [10] applied acupuncture combined with compound white mustard oil moving cupping to treat myofasciitis myofasciitis, 45 patients in the observation group and 45 patients in the control group, and the control group was treated with acupuncture combined with warm needles, and the total effective rate of acupuncture combined with moving cupping was 91.1% significantly higher than that of the control group, which was 86.7%. Wang Yanmei [11] used moving cupping and acupuncture at Jiaji points to treat low back myofasciitis. There were 46 patients in the treatment group and the control group. The total effective rate of the control group was 89% lower than that of the treatment group 98%. Zhang Jun [12] also used moving cupping and acupuncture to treat 46 patients. The total effective rate of the treatment group was 91.30%, which was significantly higher than that of the control group 60.87%. The above three authors' efficacy evaluation criteria are formulated with reference to the 'TCM Syndrome Diagnosis and Efficacy Standard' of the State Administration of Traditional Chinese Medicine, and all show that acupuncture combined with cupping is more effective than single method in the treatment of low back myofasciitis.

3.1.2 Acupuncture combined with massage therapy

For lumbodorsal myofasciitis, massage therapy can soothe tendons and activate blood, relieving spasms and pain [13]. The etiology of low back myofasciitis is related to muscle strain, metabolic disorders, and wind-cold-dampness invasion [14]. Massage therapy has the effect of relaxing tendons and activating collaterals, warming meridians and collaterals, dispersing knots and relieving pain, and regulating meridians and rectifying manipulation is also a common method for the clinical treatment of lumbodorsal myofasciitis. Hu et al. [16] used acupuncture at Jinggu point combined with massage positive excitation point to treat 40 patients with low back myofasciitis in the experimental group, with a markedly effective rate of 62.5%. 40 patients in the control group were treated with electroacupuncture, with a markedly effective rate of 40.0%. The markedly effective rate of the experimental group was significantly higher than that of the control group. Zhao Guangyu [17] research results of meridian massage with stagnant needle treatment group of 30 patients with a total effective rate of 93.33%, pure meridian massage control group of 30 patients with a total effective rate of 86.67%, the overall efficacy of the treatment group was significantly higher than the control group, and the treatment group was significantly better than the control group in terms of improvement of lumbar dysfunction (ODI) (P = 0.005 < 0.05). He Lijun [18] used massage combined with milli-fire acupuncture to treat 36 patients with myofasciitis, and 34 patients in the control group were treated with massage alone, the VAS and ODI scores 1 week after treatment compared with the pre-treatment, massage combined milli-fire acupuncture scores were significantly better than the massage group (P < 0.05), and the VAS scores after VAS treatment compared with the pre-treatment tui na combined milli-fire acupuncture group the VAS scores of the massage group was lower (P < 0.05), the Both massage treatment and massage combined with milli-fire needle treatment could significantly improve the pain (VAS) and lumbar function (ODI) of myofasciitis, but massage combined with milli-fire needle was better than massage treatment alone in terms of analgesia and improvement of lumbar function in the immediate treatment and after-effects. The above authors all refer to the diagnostic criteria of lumbodorsal myofasciitis of 'diagnostic and therapeutic criteria of TCM syndromes', and all show...
that the therapeutic effect of acupuncture combined with massage manipulation is significantly better than that of single therapy.

3.1.3 Oral administration of Chinese medicine combined with massage therapy

Oral administration of TCM has a good effect on lumbodorsal myofasciitis. For example, Wang Qingcheng [18] and others used Sishen Pill to treat 36 cases of patients with lumbodorsal myofasciitis, with a total effective rate of 97.2%. However, traditional Chinese medicine is often used in combination with other non-pharmacological therapies, for example, Wang Fulin [19] on the basis of oral administration of Shujin Tongluo Decoction combined with manipulation in the treatment of 200 patients, 122 cases were cured, 46 cases were markedly effective, 32 cases were effective, and 0 cases were ineffective. The combination of the two treatments, both internal and external, regulates the tendons and relaxes the tendons, collateral-unblocking and pain-relieving. Huang Sen [20] used Shuji formula combined with massage manipulation to treat 99 cases of chronic lumbodorsal myofasciitis patients, and the total effective rate of Shuji formula group was 93.94%, which was significantly higher than 78.79% of western medicine group and 75.76% of massage group. In the acute attack of lumbodorsal myofasciitis, it may be difficult to rely only on oral medication, while massage, acupuncture and other therapies can quickly relieve pain, oral Chinese medicine can be used to treat both the root of the problem and overall conditioning, so the two are more effective in combination [20]. The above three researchers all evaluated the curative effect according to the 'TCM syndrome diagnosis and curative effect standard' issued by the State Administration of Traditional Chinese Medicine, and all showed that the curative effect of traditional Chinese medicine combined with massage in the treatment of lumbodorsal myofasciitis was significantly better than that of single therapy.

3.1.4 Oral administration of Chinese medicine combined with acupuncture

Oral Chinese medicine combined with acupuncture also has a significant effect. Qin Wei et al. treated 54 cases of cold-dampness syndrome lumbodorsal myofasciitis patients with oral San Sheng Decoction combined with Jin’s Three Needling, the total effective rate of 96.30% was significantly higher than the total effective rate of 85.19% of the use of intermediate-frequency physiotherapy combined with drug therapy in the control group, and the recurrence rate of the observation group 3 and 6 months after treatment was significantly lower than that of the control group. The combination of the two treatment is not only effective, but also can effectively control the short-term recurrence of the disease. He Wenwen used Guizhi Jiangfu Ejiao Decoction combined with silver needle heat conduction therapy to treat 36 patients with wind-cold-dampness type lumbar back myofascitis in the experimental group. The effective rate was 91.7 %, which was better than 72.2 % in the control group using silver needle heat conduction therapy. Kou Jiyou et al. used plum-blossom needle percussion combined with Huashi Jiening Decoction to treat 54 patients with lumbodorsal myofasciitis of cold-dampness stagnation type. The total effective rate was 96.30 %, which was significantly higher than that of the control group (oral ibuprofen extended-release capsules total effective rate of 88.89%). The plum-blossom needle tapping therapy is simple and effective. The Huashi Jiening Decoction seeks the root of treatment and treats the patients based on syndrome differentiation. The effect of direct plum-blossom needle tapping combined with Huashi Jiening Decoction is better . The efficacy evaluation criteria of the three study authors refer to the 'TCM Syndrome Diagnosis and Treatment Criteria' and 'Clinical Diagnosis and Treatment Guidelines-Orthopedics Volume ', and all show that the effect of oral administration of traditional Chinese medicine combined with acupuncture in the treatment of low back myofasciitis is significantly better than that of single method.

3.2 Traditional Chinese medicine treatment combined with physical therapy

Physiotherapy includes manipulation therapy, exercise therapy and physical factor therapy, which has good efficacy for lumbodorsal fasciitis. Physiotherapy is often used in combination with other therapies to achieve better therapeutic effect. For example, ultrashort wave therapy combined with other methods to treat lumbodorsal myofasciitis, organic superimposed a variety of biological effects, the therapeutic effect is better. Physiotherapy combined with Chinese medicine has a very good therapeutic effect on the treatment of lumbodorsal myofasciitis.

3.2.1 Acupuncture combined with physical therapy

Acupuncture can be used in conjunction with many physical therapy methods. SNAG technology, known as Sustained Natural Apophyseal Glides, is one of the commonly used rehabilitation techniques for the treatment of low back pain in foreign countries, for example, Zhugejian used Jin’s Three Needling in combination with SNAG technology to treat 30 patients, with a total effective rate of 93.3% significantly higher than that of the control group, which used conventional rehabilitation therapy combined with intermediate-frequency physical therapy, at 63.7%. The combination of Jin’s Three Needling can quickly and effectively relieve back pain and fascial inflammation, and the SNAG technique can improve the blood supply of lumbar soft tissues and eliminate lumbar dysfunction, which makes the combination of the two therapeutic efficacies significant. Liu Guiling applied acupuncture combined with electromagnetic wave therapeutic instrument to treat 56 cases of patients with lumbodorsal myofasciitis, and the healing rate of the observation
group was 23.21%, and the effective rate was 94.64%, which was significantly higher than that of the control group of 14.29% and 64.29%. This method can significantly improve the clinical symptoms of patients' low back muscle pain, stiffness, etc., and play a rapid pain relief, relieve muscle spasm, promote the absorption of inflammation, and have few adverse reactions. Huang Fang and other use of TENS combined electroacupuncture for the treatment of 40 cases of lumbodorsal myofascitis patients, the results of TENS combined with electroacupuncture treatment group's total effective rate of 97.5% is significantly higher than the simple electroacupuncture treatment 82.5%, and the recurrence rate of the two combined treatment of 9.7% is significantly lower than the control group 35.0%. However, the only shortcoming of using TENS alone is that its therapeutic effect is not long-term, so it is very important to combine TENS with other therapies. Chen et al. gave acupuncture treatment to 23 patients in the control group, and 27 patients in the treatment group combined with functional magnetic stimulation on the basis of acupuncture treatment. The total effective rate of the treatment group was 96.30 %, which was significantly higher than that of the control group (86.96 %). The above four researchers evaluated the diagnosis and treatment according to the 'Criteria for Diagnosis and Efficacy of TCM Syndromes', 'Guidelines for Clinical Diagnosis and Treatment of Orthopedics' and 'Guiding Principles for Clinical Research of New Drugs of Traditional Chinese Medicine', and all showed that the efficacy of acupuncture combined with physical therapy for low back myofascitis was significantly better than that of a single method.

3.2.2 External application of traditional Chinese medicine combined with physical therapy

Lin Huainan et al. treated 36 patients with Zhengqing Fengtongning injection through the electronic pulse therapeutic apparatus in the most painful point of ion introduction combined treatment of 36 cases. After two weeks of treatment, the total effective rate was 94.44 %, which was better than that of the control group (16.67 %). Zhengqing Fengtongning iontophoresis has a long action time, rapid onset, and avoids the first-pass effect of the liver and the inactivation of the drug by the gastrointestinal tract, improves the bioavailability, and reduces the efficacy. Huang Rongyu and others used traditional Chinese medicine fumigation and intermediate frequency electrotherapy to treat 30 cases of lumbar myofascitis patients, with significant efficacy and the combination of the two cure rate of 60% is higher than the control group of 43.3%, in addition, the Pittsburgh Sleep Quality Index Scale score after treatment was lower in the treatment group than in the control group (P<0.05). In addition, traditional Chinese medicine fumigation and intermediate frequency electrotherapy can avoid the adverse reactions caused by the long-term use of Western medicine and the high medical cost, which has great advantages and development potential. Li Shilin The use of Chinese medicine iontophoresis combined with ultrashort wave in the treatment of 34 patients with low back myofascitis was 94.12 %, and the control group was 72.73 %. The effective rate of the treatment group was significantly higher than that of the control group. The three authors all evaluated the efficacy based on the 'TCM Syndrome Diagnosis and Efficacy Standards' issued by the State Administration of Traditional Chinese Medicine. The results showed that the efficacy of external use of traditional Chinese medicine combined with physical therapy for low back myofascitis was significantly better than that of a single method.

3.2.3 Extracorporeal shock wave therapy combined with traditional Chinese medical treatment

Extracorporeal shock wave is a special sound wave, which can directly reach the deep tissues and promote tissue repair with cavitation. It has the characteristics of non-invasive, convenient operation and high repeatability, and its therapeutic mechanism is to achieve a certain pain-relieving effect by dilating local blood vessels and stimulating local blood circulation; and secondly, it can also effectively improve the metabolism of the treatment site, reduce inflammation and relieve pain. Liu Bangneng et al. used oral and external application of Shen tong Zhu yu Decoction combined with shock wave to treat 33 cases of lumbodorsal myofascitis. In addition to oral administration of Shen tong Zhu yu Decoction, the dregs were also applied to the affected area. The total effective rate of the combined treatment was 93.94 %, which was significantly higher than that of the control group (78.13 %). And the VAS score (P < 5) and JOA score (P < 5) of the observation group were better than that of the control group after 2, 3 and 4 weeks of treatment, and the plasma viscosity, fibrinogen and erythrocyte sedimentation rate of the observation group were lower than that of the control group after 4 weeks of treatment (P < 0.05). Liu Wu and others used extracorporeal shock wave combined with endothermic acupuncture to treat 50 cases of lumbodorsal myofascitis, the observation group compared with the control group VAS and SAS scores decreased significantly (P < 0.05), ODI scores decreased significantly, JOA scores increased significantly (P <0.05), the improvement rate of lumbar function in the observation group was 96 %, which was significantly higher than that in the control group (80 %). Ye Yin comb also did the same research, the total effective rate of the combined group was 98.11 %, which was higher than that of the control group (86.79 %). Both of them believed that the combination of the two had significant efficacy, and both of them found that endothermic acupuncture combined with extracorporeal evanescent shockwave treatment for lumbodorsal myofascitis was able to reduce the levels of serum SP and TNF-α. Chen Xiaochuan and others used extracorporeal shock wave combined with electroacupuncture to treat 60 cases of lumbodorsal myofascitis, and the total effective rate of the observation group was 91.67% significantly higher than that of the control group of 73.33%, and the combination of the two has precise efficacy, the
operation of which is relatively simple and effective, and it can significantly reduce the degree of pain of the patients. Ren Tianpeng used extracorporeal shock wave therapy combined with acupuncture and moxibustion to treat 45 patients in the observation group with a total effective rate of 97.78%. The total effective rate of acupuncture and moxibustion in the control group was 82.22% lower than that in the observation group. After treatment, the inflammatory factor level, pain factor level, pain degree and lumbar function of the observation group were better than those of the control group, but there was no significant difference in the total incidence of complications and recurrence rate between the two groups. The five researchers all showed that the efficacy of extracorporeal shock wave therapy combined with traditional Chinese medicine in the treatment of low back myofasciitis was more significant than that of single therapy.

3.3 Combined Physical Therapy

There is little literature on the combined use of physical therapy methods. Xu Huaqun used wax therapy combined with bridge exercise to treat 80 patients in the treatment group, and the control group was treated with ibuprofen. After 6 months of follow-up, the total effective rate of the treatment group was 97.5%, which was significantly higher than that of the control group 70.0%. Ding Yi, et al. used the Suspension massage exercise technique combined with kinesio tape to treat 30 cases of lumbar myofasciitis patients, and the improvement rate of 90.00% and the recurrence rate of 16.67% in the treatment group were better than those of the control group (76.67% and 36.67%). Suspension massage exercise technique combined with kinesio tape, whether it is short-term relief to improve the pain symptoms of lumbar myofasciitis, or the maintenance of long-term therapeutic effect, the effect is excellent, and the operation is simple, the patient is easy to accept. Wuxiaoyan and other use of infrared combined with intermediate frequency electrotherapy treatment of lumbo-dorsal myofasciitis, divided into intermediate frequency group, infrared group, intermediate frequency + infrared group of 20 cases, the combined treatment effect is significantly better than a single treatment. Infrared light can not only be used as a treatment method for lumbo-dorsal myofasciitis, but also as an auxiliary diagnostic tool, which can accurately locate the excruciating pain points for targeted treatment.

Three researchers referred to the criteria for the diagnosis and efficacy of TCM syndromes or McGill. The efficacy evaluation of the pain scale showed that the efficacy of physical combined therapy in the treatment of low back myofasciitis was significantly better than that of single therapy.

4. Summarize

There is a lack of more systematic and in-depth research on Chinese medicine treatment methods and physical therapy methods for lumbo-dorsal myofasciitis, and the combination of Chinese medicine treatment methods and physical therapy methods should be the focus of subsequent research in the future. Different treatment methods should be used according to different patients, appropriate and effective methods should be selected for comprehensive treatment, personalized treatment plans should be formulated, and patients' long-term conditions and recurrence should be followed up after treatment in order to obtain more comprehensive and systematic clinical data.

Domestic research on the combined treatment of lumbo-dorsal myofasciitis is mainly based on the combination of Chinese medicine treatment methods, or the combination of Chinese medicine treatment methods and physical therapy methods, and there are fewer studies on the combination of physical therapy methods. Single treatment methods have their exact efficacy, but the efficacy of combining with other methods is better than single method treatment. The evaluation indexes in the study are mainly based on the total effective rate, pain and function scores after treatment, and only individual scholars have observed the recurrence rate. Moreover, there are various methods for treating lumbo-dorsal myofasciitis in the clinic, each with its own efficacy, and there are no unified treatment parameters and standards to evaluate and compare the efficacy of different combination therapies. Therefore, it is important to conduct a high-quality randomized controlled study to further explore the clinical efficacy of non-surgical treatment methods for lumbo-dorsal myofasciitis.

References


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