Int J Clin Exp Med 2016;9(2):866-876
www.ijcem.com /ISSN:1940-5901/IJCEM0011821

Original Article

Clinical research on a myofascial pain trigger point combining Baihui acupoint therapy of myofascial pain syndrome and living quality analysis

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Received June 23, 2015; Accepted January 9, 2016; Epub February 15, 2016; Published February 29, 2016

Abstract: Objective: This study probes the clinical effectiveness and safety of a therapy of myofascial pain syndrome making use of both trigger point of myofascial pain and Baihui acupoint using clinical epidemiology, clinical research methodology and mathematical statistics analysis to further standardize its clinical effect for a better social benefit. Methods: We divided 150 patients with myofascial pain syndrome into trigger point+Baihui group (simplified as combination group), Baihui control group (simplified as Baihui group) and trigger point control group (simplified as trigger point group) in a point of 1:1:1. The treatment was given every other day in a course of 10 days. Observation lasted for one course of treatment. We collected data including pain rating index (PRI), pain degree in lesion sites, cervico-shoulder motion condition, improvement in pain degree and joint activity index, severity of tenderness and swelling, psychological condition, cephalalgia and motion range of cervical spine before and after treatment. Results: After treatment, patients in combination group showed a total improvement rate of dysphoria of 92%, which was significantly higher than that in Baihui group (76%) and trigger point group (74%) ($P < 0.05$). Total improvement rate of cephalalgia and dizziness was respectively 78%, 54% and 60% in three groups. The difference between combination group and those of the rest was significant ($P < 0.05$). There were significantly more conspicuous alleviation over cervical motion range, shoulder joint pain, medial and external rotation of shoulder (degree) in combination group than those in other two groups ($P < 0/05$). Pain index integral of complication group after treatment was 47.3±6.8, which was significantly higher than those of the other groups ($P < 0.05$). PRI perception, emotion and total integral of combination group was respectively 5.43±1.38, 3.12±0.98 and 8.55±3.39, which was significantly lower than other groups ($P < 0.05$). Symptoms like cervico-shoulder pain, pain and numbness of upper limbs, affected work and living ability, weakened muscle strength, difficulty in finishing backhand back touching and ear touching test were all alleviated significantly more in combination group than the other groups, while there was little difference within the rest groups. In all dimensions of living quality but material life there existed significant difference among groups, which was rather notable in physiological, psychological and social functional dimensions, indicating that subjective state of patients was more affected than their objective state. Conclusion: This study primarily proved that the therapy making use of both trigger point of MPS and acupuncture of Baihui acupoint can significantly alleviate clinical signs of patients with MPS and enhance flexibility of their shoulder joint. It serves as a method of spasmolysis, analgesia and arthrolysis, elevating patients' quality of life and work effectively.

Keywords: Cervicoshoulder myofascial pain syndrome, myofascial pain syndrome, trigger point, acupuncture, Baihui acupoint

Introduction

Myofascial pain syndrome (MPS), or fibrositis, is a type of chronic painful disease. It is a comprehensive concept [1, 2]. Myofascial pain syndrome stands for the aseptic inflammation of muscle and fascia that occurs when harmful factors like coldness, fatigue or inappropriate sleeping position appear. Underlying causes of this disease include acute and chronic damage and strain of muscle, ligament and articular capsule [3]. Its major clinical signs include pain, stiffness and pressure on lesion sites and sometimes spread to subcutaneous fascias and nodules [4]. Symptoms may aggravate for change of weather or infection of cold while activities ease the pain. The symptoms are often recurrent. When an acute attack takes

Table 1. Comparison of basic information of included patients

Index	Baihui group	Trigger point group	Combination group	X^2	F	*P*
Age	43.24±8.74	41.87±8.90	42.13±10.01		0.72	0.69
Sex	21:29	26:24	27:23	0.33		0.81
Course (in months)	20.21±7.89	21.45±8.15	22.19±8.01		0.18	0.94

Note: Age and course were processed using variance analysis, data expressed as $\bar{x}$±s. chi-square was employed in sex tests, data expressed as male: female.

place, local muscles may turn tense and suffer from spasms with their motion largely limited. Major causes of MPS include the aseptic inflammation of muscle and fascia that produces adhesion and trigger points. Most patients with MPS are adult elder people after injury and rarely occur in adolescents [5]. The myofascial pain caused by MPS attributes to trigger point. It can cause pain in lower back and around joints.

MPS is a common disease that causes pain in lower back, neck-shoulder and around joints [7-9]. MPS was introduced by Geowers in 1904. He considered it as caused by mild non-suppurative rheumatism of soft tissues. Chief complaint of the disease was chronic pain which intervened patients' life and work. Before the name was determined there were several denotations of the disease including myalgia or myalgic Pots that emphasized tenderness at trigger point and transition region [10], fibromyositis emphasizing palpability of nodule and tenderness and non-articular rheumatism emphasizing local myalgia, tenderness and the translocation of myalgia towards joints [11]. On the 55th annual meeting of American association of physical medicine and rehabilitation in 1978, the disease was named as myofascial trigger point syndrome, or myofascial pain syndrome for short.

Cervicoshoulder myofascitis refers to cervicoshoulder muscle strain, regional pain, regional fascial adhesion, cicatrix and contracture producing conspicuous tender points and stiff muscle. It has wide pain dimensions and is hard to cure [12]. Its incidence rate rises with age of patient and shows a clear lower-age tendency. Cervicoshoulder myofascitis was also called cervicoshoulder fibromyositis or muscular rheumatism. It is a clinically important nonspecific disease. Its symptoms, including pain and numbness in cervicoshoulder areas, usually grow on the base of chronic strains and are characterized by their recrudescence which spoils daily life of patients. This disease is slow in pathogenesis and possesses a long course. It often shows negative results in X-ray tests [13]. Its pathological mechanism is that pain and traumatic aseptic inflammation of soft tissues turn muscle into long-term contraction state and causes muscle tone; long term muscle spasms cause regional vasospasms, insufficient blood supply in muscle and fascia and dystrophy that may aggravate the inflammation, thus forms a vicious cycle and worsens the pain [14]. The exact cause of MPS is still unknown, but clinical observations suggest that it is relevant to microtrauma, tire and frigorism. Pathologically it's caused by blocked capillaries and microcirculation.

By now, medicines clinically used drugs for MPS include NSAIDs, tricyclic antidepressant, 5-HT agonist, 5-HT reuptake inhibitor and capsaicin [15-17]. While NSAIDs can ease the pain of MPS, common gastrointestinal risks like gastrorrhagia and gastric ulcer brought about in its long term use limit its clinical application in treatment of NPS [16]. There now exist diverse therapies of MSP, but none of them has shown significant clinical effect by now. Comprehensive conservative treatments like acupuncture and massage are by now the mainstream. Acupuncture therapy of western medicine has moved over regional trigger point, critical trigger point and satellite trigger point towards remote point locating. Acupuncture therapy of Chinese medicine takes pilot study while following traditional Chinese philosophy of meridians.

MSP is an important cause of muscular pain, but there are varied diagnostic criteria and clinical therapies for MPS. Since early stage diagnosis and treatment of MPS has critical effect on restraining MPS gaining translocation ability, making researchers gravitate towards it. This study, which is based on current achievements, employs clinical epidemiology, clinical research methodology and mathematical statistics analysis to probe the clinical effect and safety of a therapy of MPS combining the use of trigger point and acupuncture. Clinical random-

Table 2. Comparison of shoulder pain and motion condition among groups before treatment (cases)

Index	Group	Number of cases	None	Mild	Moderate	Severe	*H*	*P*
Pain severity	Baihui group	50	0	21	15	14	0.73	0.91
	Trigger point group	50	0	23	14	13		
	Combination group	50	0	24	12	14		
Medial rotation of shoulder joint	Baihui group	50	0	18	23	9	1.38	0.29
	Trigger point group	50	0	20	21	9		
	Combination group	50	0	21	22	7		
External rotation of shoulder joint	Baihui group	50	0	16	17	17	0.49	0.88
	Trigger point group	50	0	18	16	16		
	Combination group	50	0	15	19	16		
Soreness in limbs	Baihui group	50	15	12	15	8	0.16	0.92
	Trigger point group	50	14	13	13	10		
	Combination group	50	16	14	12	8		
Supine inability	Baihui group	50	8	13	16	13	1.26	0.37
	Trigger point group	50	10	15	14	11		
	Combination group	50	7	12	17	14		
Unfavorable metastasis	Baihui group	50	0	19	15	16	0.47	0.78
	Trigger point group	50	0	22	17	11		
	Combination group	50	0	23	14	13		

Note: data in table were processed using Ridit analysis. $P > 0.05$ in all cases.

ized control study was adopted to compare its effect with that of isolated trigger point treatment and acupuncture treatment. Our ultimate goal is to explore a safe, effective yet economical solution in treatment of MPS and to maximize social benefits.

Materials and methods

General information of patients selected

We chose 200 patients with MPS in hospital from 2010.11 to 2014.10 and into trigger point+Baihui group (simplified as combination group), Baihui control group (simplified as Baihui group) and trigger point control group (simplified as trigger point group) in a point of 1:1:1. There were 21 male and 29 female patients in Baihui group whose age ranged from 31 to 73 years old and had courses ranging from 0.5 to 7.5 years. There were 26 male and 24 female patients in Baihui group whose age ranged from 28 to 71 years old and had courses ranging from 0.5 to 8 years. There were 27 male and 23 female patients in Baihui group whose age ranged from 32 to 75 years old and had courses ranging from 1 to 8 years. General information of patients was statistically processed and was not significant ($P > 0.05$), which assured comparability (**Tables 1**, **2**).

Diagnostic criteria

Our diagnostic criteria referred to that in Diagnosis and *Efficacy Criteria of Chinese Medicine*: it takes place in cervicoshoulder areas and can be either acute or chronic. Common causes include rheumatism and muscular strain. Clinically it manifests as sore and pain that aggravate in colder condition and alleviate when it gets warmer. It possesses the character of repeated attacks. Localized muscular tension and tenderness can be easily observed, with the appearance of conspicuous palpable nodules or stripes, while patients show little abnormality under X-ray tests and chemical examinations other than accelerated ESR in a few cases.

Selection and exclusion criteria

Selection criteria: Meeting diagnostic criteria of MPS; aged at 31-75; not bearing severe organ diseases or acupuncture contraindication; compliant in treatment and willing to sign the agreement of treatment.

Table 3. Comparison of mental status and cephalalgia and dizziness among groups before and after treatment (cases)

Index	Group	Number of cases	Aggravation	No alleviation	Class I alleviation	Class II alleviation	Class III alleviation	*H*	*P*	Total alleviation rate	X^2	*P*
Dysphoria	Baihui group	50	0	12	14	10	14	0.42	0.041	76%	0.83	0.028
	Trigger point group	50	0	13	11	14	12			74%		
	Combination group	50	0	4	16	15	15			92%		
Cephalagia & dizziness	Baihui group	50	0	23	8	7	12	0.69	0.027	54%	0.79	0.013
	Trigger point group	50	0	20	9	6	15			60%		
	Combination group	50	0	11	12	10	17			78%		

Note: Ridit was employed to analyze difference before and after treatment; total alleviation rate was evaluated using chi-square test.

Exclusion criteria: Not meeting diagnostic criteria; bearing cervical spondylosis, cervical tuberculosis or thoracic outlet syndrome; having received other therapies within 24 hours; bearing severe organ diseases or other severe pain.

Methods

Clinical research design: In this research we adopted random controlled study, dividing patients into Baihui group, trigger point group and combination group by proportion of 1:1:1. In practice, staff members generated random numbers using SAS and printed them into cards. Each card was then covered into an envelope with corresponding serial number. Patients opened the envelope of his serial number in beginning of their treatment and were divided into particular groups as told by the card.

Treatment and operation methods

Baihui group: First, we disinfected acupoints with regular 75% alcohol, then performed under strictly aseptic condition 1-handed rapid needle insertion using no. 28 acupuncture needles. Needles were horizontally inserted with depth of 30-40 mm. For patients feeling severe pain, needles were inserted along routine of meridians with strong twists making stimulation spread to cervical areas; for patients feeling numb needles were inserted along the routine of meridians with gentle twists. After desired sensation was brought, we connected the cable of G-6805 electroacupuncture therapeutic apparatus manufactured by Shanghai Huayi medical instrument factory. We used DC at frequency of 40 times per minute. The wave form was dilatational while strength was adjusted due to varied tolerance of patients. The apparatus was electrified for 30 minutes each time.

Trigger point group: Applied trigger point therapy of MPS [18].

Combination group: Combined the therapy of both groups.

Treatment course: Treatment was given every other day. One course consists of ten times of treatment. Observation lasted for one course. Each group filled observation table carefully as guided. We conducted effect evaluation after one course of treatment.

Pain evaluation standard

Pain was evaluated using visual analogue scale (VAS) method, which was, to measure pain using a 10 cm line segment with marking interval of 1 cm. The left vertex of the line stood for nopain while the right one stood for severe pain. Patients chose due point that matches the severity of their pain, and the distance between left vertex and the point stood for severity of pain. Effect percentage = [(headache index before treatment - headache index after treatment) - headache index before treatment]*100% Efficacy was divided into four levels, which were basically recovered, significant, effective and ineffective. Basically recovered: with effect percentage of 90%-100% in two months of observation after treatment; significant: 55%-90&; effective: 20%-55%; ineffective: 0-20%. Evaluation criteria of tenderness: pain under gentle pressure or refusal to pressure = 3 points; pain under pressure but no refusal = 2 points; pain under pressure with force = 1 point. Evaluation of muscular spasm: platy = 3 points; with poor elasticity = 2 points; with slight spasm = 1 point. Evaluation of joint motion limitation: limitation > 30 = 3 points; > 30° limitation > 10 = 2 points; > 10° limitation = 1 point.

Table 4. Comparison of moving condition of cervical and shoulder joints among groups before and after treatment (cases)

Index	Group	Number of cases	Aggravation	No alleviation	Class I alleviation	Class II alleviation	Class III alleviation	*H*	*P*	Total alleviation rate	X^2	*P*
Cervical moving condition	Baihui group	50	0	22	11	8	9	0.71	0.028	56%	0.92	0.037
	Trigger point group	50	0	23	10	10	7			54%		
	Combination group	50	0	11	15	13	11			78%		
Alleviation of shoulder pain	Baihui group	50	0	17	11	12	12	0.49	0.015	66%	0.85	0.028
	Trigger point group	50	0	14	12	13	11			72%		
	Combination group	50	0	4	16	15	15			92%		
Medial rotation of shoulder joint (degree)	Baihui group	50	0	14	12	11	13	0.79	0.019	72%	0.63	0.037
	Trigger point group	50	0	15	13	10	12			70%		
	Combination group	50	0	10	16	14	15			90%		
External rotation of shoulder joint (degree)	Baihui group	50	0	16	13	11	12	0.89	0.042	72%	0.39	0.029
	Trigger point group	50	0	16	12	12	10			72%		
	Combination group	50	0	5	15	15	15			90%		

Criteria of efficacy

Class I alleviation: severity extent was lowered by 1 level; Class II alleviation: severity extent was lowered by 2 levels; Class III alleviation: severity extent was lowered by 3 levels.

Criteria of halting and quitting clinical trial

Physicians in the staff should carefully note down the relationship between clinical trial and the reason it should halt. Evaluation should also be conducted as the trail halted as: Unable to continue the treatment; with severe side-effects; attacked by other severe complications during clinical trail; with symptomatic deterioration. When patients asked to quit the trial, reasons should be noted in detail and evaluate them as: (1) offered to quit the trail; (2) failed to visit for further consultation in time (causes should be investigated via telephone or letters); (3) et cetera.

Recording of clinical research

(1) All cases were observed with care following requirements above and filled case reports carefully. (2) Treatment of patients was recorded carefully with detailed explanations. (3) Original case report forms should not be amended, one could only add annotations with his signature and date. (4) Laboratory data in treatment should all be recorded. Outpatients should stick original report onto their case reports. (5) Laboratory data within normal range should be recorded, and relatively high or abnormal data must be checked and give necessary explanations.

Statistic analysis

SPSS 15.0 was used to process statistical analysis after database was built. Measurement data was performed as mean ± SD while enumeration data was represented by constituent ratio (%). F test was employed in measurement data comparison between groups while multiple comparison used q test. Paired t test was used in comparison of the same object before and after treatment. Comparison of categorical data among groups was completed using x^2 test. Comparison of several categorical data within group was finished using Ridit analysis. Statistical graph was drawn by GraphPadPrism-5.0.

Results

Psychological condition and physiological condition including signs like headache and dizziness has significantly elevated after combination therapy

To probe the effect of our combination therapy on the psychological and physiological state of patients with MPS, we conducted statistic analysis on data collected before and after treatment. Results demonstrated that after treatment, patients in combination group showed a total improvement rate of dysphoria of 92%, which was significantly higher than that in Baihui group (76%) and trigger point group (74%)

Table 5. Comparison of disappearing rate of symptoms after treatment

Symptoms and signs	Group	Disappearance rate of symptoms (%)	X^2	*P*
Cervicoshoulder pain	Baihui group	80.00	2.76	0.021
	Trigger point group	78.00		
	Combination group	90.00		
Pain and numbness of upper limbs	Baihui group	23.58	3.45	0.037
	Trigger point group	14.35		
	Combination group	40.73		
Affected work and study ability	Baihui group	31.74	0.48	0.018
	Trigger point group	34.27		
	Combination group	47.21		
Weakened strength of upper limbs	Baihui group	16.29	0.95	0.047
	Trigger point group	14.63		
	Combination group	29.46		
Pain in shoulder joint	Baihui group	83.42	1.58	0.038
	Trigger point group	85.81		
	Combination group	93.28		
Medial rotation	Baihui group	75.43	1.73	0.56
	Trigger point group	80.53		
	Combination group	86.38		
External rotation	Baihui group	63.38	0.39	0.67
	Trigger point group	67.27		
	Combination group	72.19		
Difficulty in backhand back touching	Baihui group	80.34	0.79	0.032
	Trigger point group	55.28		
	Combination group	57.29		
Difficulty in backhand ear touching	Baihui group	83.28	1.87	0.026
	Trigger point group	62.19		
	Combination group	58.32		

Note: chi-square test was employed.

(P < 0.05) (**Table 3**). The fact that there exists no significant difference between two control groups proved that combination therapy had significant effect on bettering patients' psychological condition. Later on we analyzed headache and dizziness in patients with MPS. Total improvement rate of cephalalgia and dizziness was respectively 78%, 54% and 60% in three groups. The difference between combination group and those of the rest was significant (P < 0.05). Difference between control groups was not significant, which indicated that combination therapy had significant effect on bettering patients' cephalalgia and dizziness. In summary, analysis above revealed that combination effectively lifted patients' psychological condition and physiological condition including signs like headache and dizziness.

Combination therapy significantly increased motion range of cervicoshoulder joints

To probe the effect of our combination in bettering motion range of cervicoshoulder joints in patients with MPS, we conducted statistic analysis on data collected before and after treatment. Results demonstrated that patients in all groups had significant improvement in motion range of cervicoshoulder joints and disappearance rate of symptoms (**Tables 4**, **5**). Compared to those in control groups, patients in combination group improved significantly more in shoulder joint pain, medial and external rotation of shoulder ($P < 0.05$, $P < 0.05$, $P < 0.05$). Further analysis revealed that there was no significant difference between two control groups. With all the fact above, we can conclude that combination therapy had significant effect on bettering cervicoshoulder function of patients with MPS.

Pain integral and joint motion function integral improved significantly after combination treatment

To probe the effect of our combination in pain and joint motion function in patients with MPS, we conducted statistic analysis on data collected before and after treatment. **Figure 1** demonstrated that there was no significant difference in first three sets of pain integral ($P > 0/05$, $P > 0/05$, $P > 0/05$), which implied comparability. However, when we compare the measurement before and after treatment, we found that there was significant difference in pain integral (using t test, $P < 0.05$, $P < 0.05$, $P < 0.05$). **Figure 2** implied that since joint motion integral improved in all groups, all therapies had effect on alleviating pain and bettering joint function. We worked further and found that pain index integral in combination group was 47.3±6.8, which

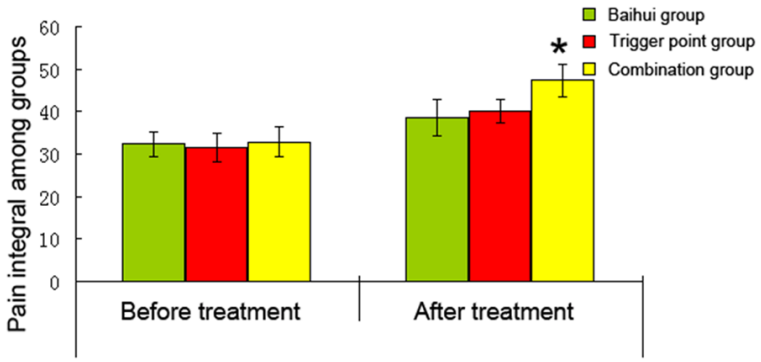

Figure 1. Comparison of improvement of pain integral among groups before and after treatment. *Significant difference compared with Baihui group.

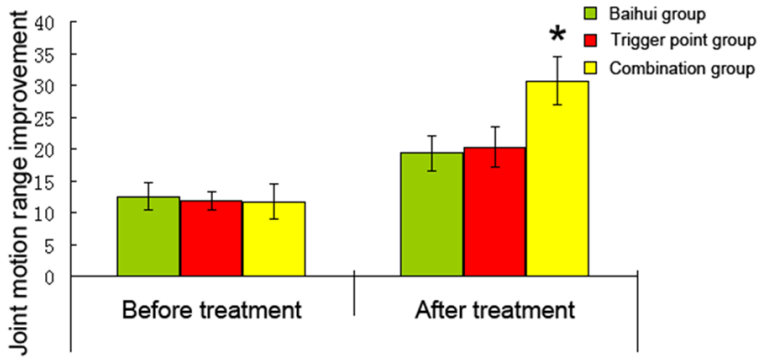

Figure 2. Comparison of joint motion range improvement among groups before and after treatment. *Significant difference compared with Baihui group.

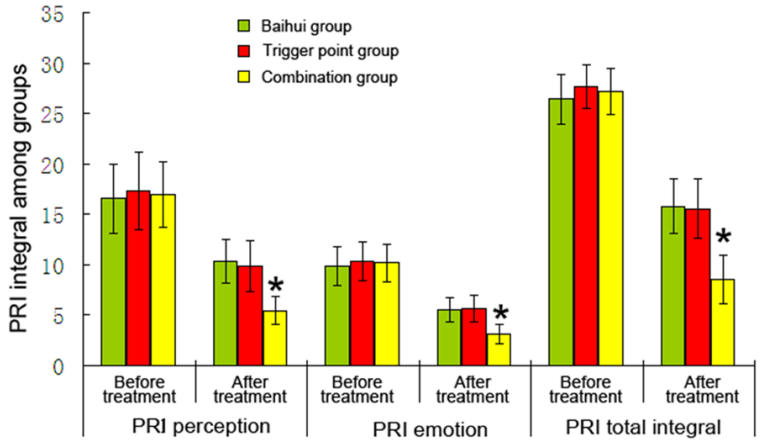

Figure 3. Comparison of PRI integral among groups before and after treatment. *Significant difference compared with Baihui group.

was significantly higher than those in control groups ($P < 0.05$). We also found that patients in combination group had joint motion integral of 30.7±3.8 which excelled measurements of control groups significantly ($P < 0.05$). These facts indicated that combination therapy had significantly better effect than other therapies.

Patients' PRI integral lowered significantly after treatment

To probe the effect of our combination on PRI integral of patients with MPS, we made questionnaire investigation and conducted statistic analysis on data collected before and after treatment. As shown in **Figure 3**, there was no significant difference in PRI integral among groups before treatment ($P > 0/05$, $P > 0/05$, $P > 0/05$), which implied comparability. PRI integral in all groups lowered significantly after treatment (paired t test, $P < 0.05$, $P < 0.05$, $P < 0.05$), indicating that all therapies alleviated pain significantly. We made further comparison among groups and found that PRI perception, emotion and total integral of combination group was respectively 5.43± 1.38, 3.12±0.98 and 8.55± 3.39, which was significantly lower than control groups ($P < 0.05$, $P < 0.05$, $P < 0.05$). These facts indicated that combination therapy had significantly better effect than other therapies.

Clinical symptoms and physiological signs of MPS ceased significantly

To probe the effect of our combination therapy on major clinical symptoms and physiological signs, we made statistic analysis on major clinical symptoms and physiological signs before and after treatment. Results showed that all the symptoms ceased in more than 50% of patients and this result was of statistical significance ($P < 0.05$), indicating

Table 6. Comparative analysis of life quality between combination group and control gr ($\bar{x}\pm s$)

Item	Combination group	Baihui group	Trigger point group	*t*	*P*
Objective living quality					
Total score	198.23±23.82	122±19.79	137±19.79	2.28	< 0.01
Physiological dimension	32.28±1.79	21.62±3.21	21.19±2.28	2.33	< 0.05
Psychological dimension	21.99±1.23	15.56±3.22	13.16±2.87	2.85	< 0.01
Social functional dimension	27.34±4.29	21.55±3.76	19.94±3.26	2.77	< 0.01
Material dimension	20.99±2.78	19.91±2.67	20.83±2.24	1.56	> 0.05
Subjective living quality					
Physiological dimension	26.65±3.82	19.39±2.83	20.26±2.74	2.82	< 0.01
Psychological dimension	18.92±2.37	13.29±2.15	12.84±2.26	2.72	< 0.01
Social functional dimension	16.27±2.13	11.24±1.98	12.01±2.07	2.81	< 0.01
Material dimension	21.28±4.24	20.88±5.45	20.91±5.23	1.51	> 0.05

that our combination therapy was effective. We further compared results in different groups and found that symptoms like cervicoshoulder pain, pain and numbness of upper limbs, affected work and living ability, weakened muscle strength, difficulty in finishing Alpey scratch test and backhand ear touching were all alleviated significantly more in combination group than control groups. However, there was no significant difference in condition of medial and external rotation of shoulder among groups ($P > 0.05$, $P > 0.05$). These facts indicated that combination therapy had significant effect on alleviating clinical symptoms and physiological signs of MPS.

Analysis of living quality of patients with MPS after treatment

To probe the effectiveness of combination in lifting patients' living quality, we conducted statistic analysis on living subjective and objective quality of patients in different groups from including physiological, psychological, material and social perspectives. As shown in **Table 6**, in all dimensions of living quality but material life there existed significant difference among groups, which was rather notable in physiological, psychological and social functional dimensions, indicating that subjective state (satisfaction) of patients was more affected than their objective state.

Discussion

MPS is a common disease that causes pain in cervicoshoulder and adjacent joints [19]. MPS is a clinically common disease whose major feature is the existence of myofascial trigger point (MTrP) where severe pain can be easily triggered. Essentially, MTrP refers to stripes caused by crisis of regional cycle and energy metabolism in lesion sites where protective contraction of myofascitis takes place [18, 20]. Tender points appear when relevant nervous branches are oppressed by stripes and are accompanied by diffuse pain. Most cases happen in cervicoshoulder area and waist. This disease was caused mainly by muscular tension responding to external factors including overstrain, slight injury and coldness. It may cause regional poor circulation in soft tissues that might lead to lasting cervicoshoulder stiffness and pain that encumbers their daily activities [21, 22].

Myofascial trigger point is a special point on skeletal muscle where severe pain may be caused. Usually there would be a stripe-shaped palpable tight band at that point. If we press or push the trigger point, sore and painful feeling can be felt by the patient. Referred pain may also be caused in adjacent area. What's more, if we press the point frequently, we may even cause regional convulsion [23]. The appearance of trigger point may cause pain syndromes in multiple locations of the body [24]. As is discovered in researches, trigger point is the basis of development of radicular pain. We can feel induration in muscle belly during palpation of trigger points which might have been made of increased metabolites and inflammatory substances like 5-HT or P substance due to slower blood circulation [25]. The formation of MTrP might have something to do with the central nerve getting excessively sensible. Neuropeptides substances have become under the

spotlight of researchers in recent years, but since B-EP inhibits the release of neurotransmitter P and with B-EP turning less active there is more neurotransmitter P which magnifies the pain, its clinical application in treatment MPS is limited to some degree [26]. Cervical spondylosis is easily to be seen as paired by muscular trigger points in cervicoshoulder area, especially on sternocleidomastoid muscle, trapezius muscle, splenius capitis, rectus capitis posterior major or minor muscle. On these muscles exist acupoints, and Fengch, Jingjiaji, Jianbing and Baihe were among those with better effects. Acupuncture and moxibustion have played an increasingly significant role in treatment of the disease as their application on some acupoints may adjust regional blood flow so as to ease or eliminate inflammation and comfort the pain [29, 30].

While there are variegated therapies to this MPS, by now one can't claim any of them as significantly effective. In this study we unprecedentedly stated that a combined use of trigger point and Baihui acupoint brings about clinical advantages like reassured effectiveness and appreciable efficiency, which throw it into the small group of ideal therapies of the disease.

We conducted randomized controlled trials in the research to probe the efficacy of such combination therapy as Baihui acupoint group and trigger point group served as control groups. We divided patients into Baihui group, trigger point group and combination group by proportion of 1:1:1, which meant that there were 50 cases in each. These groups passed our comparability test before treatment was given. After one course of treatment, the efficacy of combination therapy was significantly than the other therapies as shown in items including cervicoshoulder pain alleviation, pain and numbness of upper limbs alleviation, affected work and living ability recovery, weakened muscle strength recovery, difficulty in finishing backhand back touching and ear touching test lowering ($P < 0.05$), which showed the laudable efficacy of our combination therapy. After 1 course of treatment, there were significant differences within each group ($P < 0.01$), indicating that PRI perception, emotion and total score, along with pain strength rank, can be lowered by all therapies. Significant differences found in data of combination group and those of control groups showed difference in efficacy ($P < 0.05$). Via pair comparison we found that most indices other than alleviation of pain strength (which showed results that were rather close to each other) suggested comparison group holding a better efficacy. Bahui group excelled trigger point group in improving PRI perception, emotion and total score along with pain strength.

In short, we proved with our clinical research that this therapy of MPS taking combined use of trigger point and Baihui acupoint effective in alleviating clinical symptoms of patients with MPS and that it serves as a method of spasmolysis, analgesia and arthrolysis. It is safe, affordable, and simple. However, limitations in time, sample size and other dimensions stopped us from further achievements, and big sample randomized controlled trials plus animal experiment studies are required to work further on long term effectiveness, safety, mechanism, pathogenesis and reliability of the trigger point combining Baihui acupoint therapy of MPS in order to optimize and standardize treatment of MPS and bring benefit to the patients.

Disclosure of conflict of interest

None.

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