

Comparison of the Rehabilitation Effects of Taichi Exercise and Functional Exercise on Scapulohumeral Periarthritis

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Abstract: Purpose: To investigate and compare the rehabilitation effects of Taichi exercise and functional exercise on scapulohumeral periarthritis. Method: Eighty patients with scapulohumeral periarthritis from a community in Jingzhou, Hubei, China, were randomly selected from January to June 2016. They were randomly divided into the experimental group and the control group. On the basis of routine treatment and nursing, the experimental group (40 patients) adopted the Taichi exercise treatment while the control group (40 patients) adopted the functional exercise treatment. In the end, the shoulder joint pain degree changes, and the improvement of shoulder joint movements and the myoelectricity and myodynamia on the surfaces of the shoulder muscle group of the two groups were tested and measured. Result: The scoring difference of shoulder joint pain between the experimental group and the control group is significant, which is of statistical significance ($P < 0.05$). Before the treatment, the difference of shoulder joint movement between the two groups isn't significant, with no statistical significance, but after the treatment, the difference is significant, which is of statistical significance ($P < 0.05$). The myodynamia difference between the two groups after the treatment is significant, which is of statistical significance ($P < 0.05$). The therapy efficiency of the experimental group is higher than that of the control group and the difference is significant, which is of statistical significance ($P < 0.05$). Conclusion: On the basis of routine physical treatment, adopting Taichi exercise can increase the therapy efficiency on the patients with scapulohumeral periarthritis, can improve the blood supply and inflammation on the shoulder and improve patient's life quality.

Keywords: Taichi exercise; Functional exercise; Scapulohumeral periarthritis

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1. Introduction

The main symptoms of the patients with scapulohumeral periarthritis are shoulder pain, limited movement and sensation of chill. Scapulohumeral periarthritis is a kind of self-limited disease, so the inflammation can be gradually gone after 1 year, the pain sensation would also cease and then the shoulder joint can gradually move. In tradition, scapulohumeral periarthritis can be classified into 3 periods: setting period, frozen period and thawing period. In the setting period, the shoulder joint capsular contraction, and the long tendon and the tendon sheath of the musculus biceps brachii are

adhered; in the frozen period, the lesions occur in joint soft tissues, and the bursa mucosa is congested and thickened, the shoulder joint pain is fierce and the movement is limited. Generally, the X-ray examination of the scapulohumeral periarthritis patient shows no obvious abnormality, therefore, the diagnosis of scapulohumeral periarthritis is commonly based on the symptoms and physical signs. At present, the treatment of scapulohumeral periarthritis is mainly conservative treatment through drugs, including the measures like analgesics and physical therapies. The purpose of this study is mainly to investigate the therapeutic effect of Taichi exercise on scapulohumeral periarthritis. The report is as follows.

2. Data and Method

2.1 General Data

Randomly select 80 patients with scapulohumeral periarthritis from a community in Jingzhou, Hubei, China, from January to June 2016. Admission criteria: the patients were diagnosed with scapulohumeral periarthritis in tertiary class-A hospitals in Jingzhou. Exclusion criteria: the patients with severe cardio-pulmonary dysfunction; the patients with severe mental diseases; the patients with severe neurologic diseases and limited activities; the patients with malignant tumor and systemic metastasis; the patients without sufficient time and unable to do exercise on time. Among the total 80 cases, the male patients are 36, with the mean age of (52.9 ± 4.6) , and the female patients are 44, with the mean age of (55.9 ± 6.3) . 43 cases are complicated with diabetes and 57 cases are complicated with hypertensive heart disease. Among them, 33 cases are in the setting period, 30 cases in the frozen period and 17 cases thawing period. The patient's condition like the period classification, complications and age have little effect on this study the therapeutic effect of Taichi exercise on scapulohumeral periarthritis.

2.2 Method

The control group adopts functional exercise treatment on the basis of routine treatment. In the routine treatment, the analgesics and local physical therapies can be given to the patients to alleviate the pain. The professional rehabilitation nurses should inform the patient of the key points of functional exercise to ensure the patients do exercise every day. The key points are: The patient keeps standing position, then its leg on the affected side goes forward one step, the body leans forward and the arms keep hanging down. Complete the movements of forward, backward and inward rotation and outward stretching under the relaxing status of the shoulder joint. Then gradually move faster and keep the body in attention position. The arms move by following a transverse circle and gradually to a vertical circle. Finally, the hands clasp and move by following a circle. Then the arms of the patient stretch upward and gradually drop down to the chest, and then the arms stretch outward. Repeat the above movements for about 30 times. If the pain on the patient is fierce and the patient is unwilling to do exercise, the family member can help the patient do the exercise and recover.

The experimental group adopts Taichi exercise treatment on the basis of routine treatment. Uniformly train the patients in the experimental group on Taichi, mainly on the movements, such as cloud hands, white crane spreading its wings, changing palms three times and grasping

the bird's tail. During the training, communicate with the patients about the meaning and concept of Taichi to make the patients pay attention to Taichi exercise and improve their enthusiasm in exercise. And it is necessary to train the patients on the normalized movements. After achieving the standard, the patients can do exercise by themselves. The exercise degree is subject to staying cool and no feeling of fatigue. The total exercise time every day should be more than 30 min. Do exercise every day for 12 weeks, and then observe the therapeutic conditions of the two groups.

2.3 Observation Indicator

The comprehensive assessment of shoulder joint adopts the Constant-Murley comprehensive scoring system^[1], with a full score of 100, including four aspects of content on pain, routine movement, the range of the movement and myodynamia of shoulder joint, and higher score on the shoulder joint represents the better movements of it. Therapeutic conditions: the therapeutic conditions of the patients are classified into obvious effective, effective and ineffective^[2], where obvious effective means: no pain sensation in the movement of the shoulder joint of patients, and the shoulder can rise up over 130° , bend forward over 75° and stretch outward over 75° ; effective means: relieved pain in the movement of the shoulder joint, and movement of the shoulder joint improves, which can rise up over 110° , bend forward over 60° and stretch outward over 60° ; ineffective means: no improvement in the shoulder joint pain and the movement range after the treatment, even worse.

2.4 Statistical Analysis

The scores of the shoulder joint pain and movements in this study were analyzed by SPSS 21.0, in which the measurement data was analyzed by the test, the enumeration data was analyzed by Chi-squared test and the difference is significant, which is of statistical significance ($P < 0.05$).

3. Results

3.1 Shoulder Joint Pain Change Scope

The difference of the pain scores before the treatment between the two groups isn't significant, but after 12 weeks of treatment, the difference of the shoulder joint pain scores between the experimental group and the control group is significant, which is of statistical significance ($P < 0.05$). See Table 1 for details. Before the treatment, the difference of shoulder joint movement between the two groups isn't significant, with no statistical significance, but after the treatment, the difference is significant, which is of statistical significance ($P < 0.05$). See Table 2 for de-

tails. The difference of the myodynamia before the treatment of the two groups isn't significant, with no statistical significance, but the difference between the experimental group and the control group after treatment is significant, which is of statistical significance ($P < 0.05$). See Table 3 for details.

Table 1. The Comparison of the Shoulder Joint Pain Scores of the Two Groups

Group	Number of case(s)	Before treatment	After treatment
Experimental group	40 cases	4.67±1.25	12.08±2.35
Control group	40 cases	4.71±1.09	9.25±2.19
T value		0.025	6.247
P		1.263	0.021

Table 2. The Comparison of the Shoulder Joint Movements of the Two Groups

Group	Number of case(s)	Before treatment	After treatment
Experimental group	40 cases	34.58 ± 3.68	50.98 ± 2.31
Control group	40 cases	35.72 ± 3.91	42.89 ± 2.27
T value		0.364	7.109
P		1.098	0.005

Table 3. The Comparison of the Myodynamia of the Two Groups

Group	Number of case(s)	Before treatment	After treatment
Experimental group	40 cases	17.10 ± 2.08	24.17 ± 2.49
Control group	40 cases	16.93 ± 2.21	19.42 ± 2.20
T value		0.451	6.087
P		1.128	0.023

3.2 The Comparison of the Therapeutic Conditions of the Two Groups

It is found that the therapy efficiency of the experimental group is higher than the control group and the difference is significant, which is of statistical significance ($P < 0.05$). See Table 4 for details.

Table 4. The Comparison of the Therapeutic Conditions of the Two Groups

Group	Obvious effective	Effective	Ineffective	Effective rate
Experimental group	18(0.45)	19(0.475)	3(0.075)	37(0.925)
Control group	10(0.25)	16(0.40)	14(0.35)	26(0.65)
X ²				12.543
P				<0.01

4. Discussion

Scapulohumeral periarthritis is also called inflammation around the shoulder joint, whose main manifestations are shoulder pain and limited movement. It often occurs in female above 50 years old, but according to the epidemiological investigation, it occurs more often in the manual workers. The shoulder joint is a kind of joint with a wide body-movement range. Its stability is mainly based on the soft tissues around and the strength of ligaments, meanwhile, the blood supply for the ligaments around the shoulder is not sufficient, so the degenerative change would easily occur as the age of the patient increases, which is the basic factor for the occurrence of scapulohumeral periarthritis in the soft tissues. And too long fixation on shoulder after the arm injury would lead to atrophy of the tissues around shoulder and adhesion, which can also lead to scapulohumeral periarthritis. The patients feel paroxysmal pain on shoulder at the early stage, then intense pain with the feature of light in the daytime and heavy at night. This may because of aggravation of the original insufficient blood supply to shoulder due to the excited pneumogastric nerve at night. There is also a possibility that the activities of the patients in the daytime can distract their attention while they are likely to focus on the shoulder at night, so that the pain sensation at night is more intense. Meanwhile, the shoulder movements of the patients are limited, which is more obvious when their arms are rising up and stretching outward. Generally, the X-ray examinations of the scapulohumeral periarthritis patients are normal. Hence, the diagnosis of scapulohumeral periarthritis is commonly based on the symptoms and physical signs. Generally, the single Western medicine treatment on scapulohumeral periarthritis has no obvious effect, so the patients should cooperate with functional exercise for treatment.

The advantages of Taichi exercise on scapulohumeral periarthritis treatment can be summarized into the following points: (1) Beneficial to mental health: Taichi is particular about the combination of exercise and awareness. It is requested that the exercisers concentrate on and give up all other thoughts like "omphaloskepsis". When people are concentrating on the movements and removing all other thoughts out of the mind, their brains can have a full rest. The pain sensation is the chief complaint from the patients with scapulohumeral periarthritis. During Taichi exercise, the attention of the patients is distracted, so the pain sensation is reduced. In the study of Yucheng Guo, et al., it is also proved that Taichi exercise can significantly ease the patients' emotions and distract their attention^[3-4]. (2) Re-

laxing the shoulder joint of the patient. Each movement, such as inward rotation, outward stretching and rising up in Taichi exercise can drive the movements of the shoulder joints. And the exercise can accelerate blood circulation, increase the returned blood volume, reduce the congested venous blood around shoulder joints and accelerate blood return, thus preventing secretion depression on shoulder joint surface, enhancing the energy and nutrition supplies to shoulder, alleviating edema and inflammation in the joint regions, decreasing the muscle cramp in the joint regions and relieving the pain. (3) Taichi exercise can enhance the lung function of the patients, reduce the blood pressure and improve the cardiac function. For some patients, the occurrence of scapulohumeral periarthritis is caused by cervical spondylosis, heart diseases and lung diseases, which lead to muscle cramp in shoulder and then cause the referred pain. The prolonged unhealed original disease can lead to the persistent cramp in patient's shoulder and ischemia, and then lead to inflammation and then turn into scapulohumeral periarthritis. However, Taichi exercise can improve cardiac and lung functions and then alleviate the symptoms.

In this study, Taichi exercise, compared with routine functional exercise, has a significant difference on the pain sensation, movement range, myodynamia and treatment efficiency. In conclusion, the Taichi exercise treatment, on the basis of routine physical treatment, on the patients with scapulohumeral periarthritis can significantly improve the treatment efficiency and the shoulder condition.

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