

Original Article

The Clinical Research of the Effectiveness of Muscle Energy Technique (MET) on Peripheral Facial Paralysis

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Objectives: The purpose of this study is to evaluate the clinical effects of Muscle Energy Technique(MET) for peripheral facial paralysis.

Methods: 60 Patients were divided into two groups. Group A(n=30) received the treatment with existing Korean medicine. Group B(n=30) received the MET with existing Korean medicine. It was performed once a day, five time per a week for three weeks. we analyzed Yanagihara's score and House-Brackmann scale

Results: A week after MET treatment, Yanagihara's score average of Group A is 7.17±6.34. Yanagihara's score average of Group B is 8.84±5.22. ($p=0.72$). Two weeks after MET, Yanagihara's score average of Group A is 12.39±4.94. Yanagihara's score average of Group B is 15.12±3.20. ($p=0.04$). Three weeks after MET, Yanagihara's score average of Group A is 17.11±5.31. Yanagihara's score average of Group B is 22.78±3.67. ($p=0.01$). A is 3.87±1.36. House-Brackmann Scale average of Group B is 3.64±1.76. ($p=0.63$). Two weeks after MET treatment, House-Brackmann Scale average of Group A is 3.20±0.97. House-Brackmann Scale average of Group B is 3.02±1.03. ($p=0.05$). Three weeks after MET, House-Brackmann Scale average of Group A is 2.84±1.12. House-Brackmann Scale average of Group B is 2.23±0.78. ($p=0.04$).

Conclusion: MET treatment is effective for improve the symptoms of peripheral facial paralysis. Therefore, it will be used to peripheral facial paralysis.

Key Words : Peripheral Facial Paralysis, MET, Muscle Energy Technique, Bell's palsy, Chuna

Introduction

Facial nerve is composed of motor nerve to control movement of facial muscles, sensory nerve to deliver taste, autonomic nerve to control saliva and tears¹). Facial paralysis is a major symptom of the peripheral type of facial palsy. Decrease or increase of the tear, auditory hypersensitivity, tinnitus, taste disorder, ear pain and salivation disorders may be associated²). Typical peripheral facial paralysis is Bell's palsy and Ramsay Hunt syndrome. Many of

these symptoms are due to Bell's palsy. Most cases of Bell's palsy, the cause is not clear. Ramsay Hunt syndrome due to herpes zoster and trauma are also cause of facial paralysis³). In generally, Bell's palsy started with the pain in mastoid process. Almost simultaneous, paralysis of facial muscles progress. Symptoms like difficulty of closing eyes, drooling and pararthria occur because of it⁴).

In Korean medicine, acupuncture, herbal medicine, physical therapy and taping therapy have been performed at facial paralysis⁵). Various treatments

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have been attempted additionally, such as electropuncture⁶⁾, Hominis Placenta pharmacopuncture⁷⁾, Bee-Venom acupuncture⁸⁾, moxibustion⁹⁾ and scalp acupuncture therapy¹⁰⁾. Recently, studies about embedding therapy have been reported^{11,12)}.

Chuna manual therapy is one of the Oriental medical treatments. It is changed unbalanced state of musculoskeletal conditions for balanced⁷⁾. Among them, Muscle Energy Technique(MET) is used for diseases associated with muscle. By the pulling force of the muscle, adhesived soft tissues are relieved. This action is effective pain relief, muscle function recovery, blood circulation improvement. And it is available for joint displacement, muscle injury, stiffness and numbness. In clinical, MET used in musculoskeletal disorders such as acute low back pain, nuchal pain^{13,14)}.

Through an analysis of the previous studies, It is estimated that MET is effective peripheral type of facial palsy. But study on the effect of MET for peripheral type of facial palsy is not enough. Thus, we are performed MET for peripheral type of facial palsy patients, results were statistically significant. So we report it.

Subject and Method

1. Subject

The research involved 60 patients who visited the acupuncture & moxibustion department at Semyung University Hospital of Oriental Medicine for facial palsy treatment from March 1, 2015 to December 31, 2015. They were diagnosed with peripheral type of facial palsy. They had no abnormalities with the brain CT or MRI examination. Purpose of the study, procedures and adverse reactions were explained enough to participants and all participants agreed to voluntarily participated. Patients were divided into two groups. Group A received the treatment with existing Korean medicine. Group B received a MET

with existing Korean medicine. In order to reduce the bias, patients were randomly assigned by the Block randomization method.

2. Selection Criteria

- (1) Patients visited the clinic within 7 days after onset
- (2) No other disease showed up on the X-ray, except for osteoporosis.
- (3) No history of Surgical Treatment or surgery about neck or shoulder disease.

3. Exclusion Criteria

- (1) Calcification or arthritis disease showed up on the X-ray.
- (2) Mental disorders, immune disorders or related drug takers.
- (3) Suspected cervical nerve disease by physical examination
- (3) The pregnant.
- (4) Patients with skin infections.
- (5) Other patient that doctor determines not suitable for this study

4. Treatment Method

1) Muscle Energy Technique (MET)

Muscle Energy Technique (MET) was performed once a day, five times per a week. Treatment was done by a Korean medical doctor who has more than three years of clinical experience. The doctor had completed the regular course of the Muscle Energy Technique.

① Upper trapezius muscle

The palm of the lead hand contacts the occipital area and the assistance hand contacts by insertion of upper trapezius muscle of the patient. The practitioner induces bending, lateroflexion, and rotation the neck of the patient to the limit that the patient can with stand, allowing the neck to then return to the middle

point. The patient breathes deeply and performs isometric exercise. The practitioner exerts a force in the opposite direction. The operation was repeated three times.

② Sternocleidomastoid muscle

The palm of the lead hand contacts the temporal area and the assistance hand contacts via insertion of the sternocleidomastoid muscle of the patient. The practitioner induces mild extension and rotation of the neck of the patient. The patient breathes deeply and performs isometric exercise. The practitioner exerts a force in the opposite direction. The operation was repeated three times.

③ Levator Scapulae muscle

The patient lies supine with put the hands under the hips. The palm of the lead hand contacts the occipital area and the assistance hand contacts by insertion of Levator Scapulae muscle of the patient. The practitioner induces bending, lateroflexion, and rotation the neck of the patient to the limit that the patient can with stand, allowing the neck to then return to the middle point. The patient breathes deeply and performs isometric exercise. The practitioner exerts a force in the opposite direction. The operation was repeated three times.

④ Scalene muscles

The patient's head supported to the doctor's lap. . The palm of the lead hand contacts the lower jaw bone area and the assistance hand contacts by insertion of scalene muscles of the patient. The practitioner induces bending, extension, and rotation the neck of the patient to the limit that the patient can with stand, allowing the neck to then return to the middle point. The patient breathes deeply and performs isometric exercise. The practitioner exerts a force in the opposite direction. The operation was repeated three times.

2) Acupuncture treatment

The acupuncture were disposable, stainless-steel filiform needles (0.30 mm x 40 mm) from Dongbang Acupuncture. Following the meridian points, the acupuncture was operated at the Yepung(TE17), Gakson(TE20), Nosik(TE19), Sajukgong(TE23), Hapgek(LI4), Yeonghyang(LI20), Hyeopgeo (ST6), Jichang (ST4), Sabaek(ST2), Chanjuk(BL2), Yangbaek(GB14), Seungjang(CV24) of the affected. The acupuncture's retaining times were 15 min. This points are based on the Korean acupuncture textbook⁴⁾.

3) Herbal medicine

Patients were taking the herbal medicine three times a day. The first week after admission were taking the ligigeopoongsan. Then, patients were taking the Bogigeopoongsan. Prescription medications were little different according to the characteristics of the patient.

4) Self Exercise and facial massage

Self exercise was carried out according to the guidance of a doctor once a day, every day. Self exercise consists of training the muscles of the face. Facial massage was carried out by physical therapist once a day, three times per a week. The massage consists of rubbing or pressing the muscles of the face.

5. Investigation analytical method

In order to the general characteristics of patients and the effect of MET, we investigated following.: 1) Distribution of gender and age 2) Distribution of facial palsy area 3) Other symptoms other than facial palsy at Onset 4) Yanagihara's score¹⁵⁾ before and after treatment 5) House-Brackmann scale¹⁶⁾ before and after treatment.

The data were expressed as mean \pm standard deviation and analyzed by using paired t test and Mann-Whitney U test of SPSS 18.0 for windows

program. Normality test was used Kolmogorov-Smirnov test. Values of $P < 0.05$ were considered as statistically significant.

1. Distributions of gender and age

The 60 patients in this study were composed of 26 man and 34 women, and the distribution of gender and age is shown in Table 3. By age, 10s is 1 people(1.7%), 20s is 5(8.3%), 30s is 5(8.3%), 40s is 11(18.3%), 50s is 17(28.3%), 60s is 19(31.7%) and 70s is 2(3.3%) . 60s has the most percentage (Table 1).

2. Distributions of facial palsy areas and other symptoms

The facial palsy was located on the left (Lt) side

in 37 patients and on the right (Rt) side in 23 patients. Other symptoms other than facial palsy at onset are postauricular pain(28.3%), lacrimation (21.7%), scheroma(16.7%), dysgeusia(0%), vertigo (3.4%), tinnitus(1.67), nausea(0%), hearing loss(0%), no symptom(28.3%). The patients selected were the most uncomfortable symptoms of multiple symptoms (Table 2).

3. Yanagihara's score

Before MET, Yanagihara's score average of Group A is 6.23 ± 5.76 . Yanagihara's score average of Group B is 5.19 ± 6.72 ($P = 0.63$). A week after MET, Yanagihara's score average of Group A is 7.17 ± 6.34 . Yanagihara's score average of Group B is 8.84 ± 5.22 . ($P = 0.72$). Two weeks after MET, Yanagihara's score average of Group A is 12.39 ± 4.94 . Yanagihara's score average of Group B is

Table 1. Distribution of Sex and Age

	Group A(n=30)		Group B(n=30)		Total (%)
	Male	Female	Male	Female	
10-19	1	0	0	0	1(1.7%)
20-29	2	1	1	1	5(8.3%)
30-39	1	2	1	1	5(8.3%)
40-49	3	4	2	2	11(18.3%)
50-59	2	5	4	6	17(28.3%)
60-69	5	3	4	7	19(31.7%)
70-79	0	1	0	1	2(3.3%)
Total	14	16	12	18	60(100%)
	30		30		

Table 2. Other symptoms other than facial palsy at Onset

Symptom	Group A(n=30)	Group B(n=30)	Total (n=60)
Postauricular pain	9	8	17(28.3%)
Lacrimation	7	6	13(21.7%)
Scheroma	4	6	10(16.7%)
Dysgeusia	0	0	0(0%)
Vertigo	2	0	2(3.4%)
Tinnitus	0	1	1(1.67)
Nausea	0	0	0(0%)
Hearing loss	0	0	0(0%)
No symptom	8	9	17(28.3%)

15.12 ± 3.20. (P = 0.04). Three weeks after MET, Yanagihara’s score average of Group A is 17.11 ± 5.31. Yanagihara’s score average of Group B is 22.78 ± 3.67. (P = 0.01). The patients exhibited a significant difference from 3 weeks after treatment. (Table 3).

4. House–Brackmann Scale

Before MET, House-Brackmann Scale average of Group A is 4.11±1.21. House-Brackmann Scale average of Group B is 4.32±1.98 (P = 0.87). A week after MET, House-Brackmann Scale average of Group A is 3.87±1.36. House-Brackmann Scale average of Group B is 3.64±1.76. (P = 0.63). Two weeks after MET, House-Brackmann Scale average of Group A is 3.20±0.97. House-Brackmann Scale average of Group B is 3.02±1.03. (P = 0.05). Three weeks after MET, House-Brackmann Scale average of Group A is 2.84±1.12. House-Brackmann Scale average of Group B is 2.23±0.78. (P = 0.04). The patients exhibited a significant difference from 4 weeks after treatment(Table 4).

medicine therapeutic effect have been reported in recent studies about Guanwasa¹⁸⁾. Guanwasa is called facial paralysis in western medicine. The facial nerve is the seventh cranial nerve. It controls the same side of the face muscles. It related to taste, tears and saliva secretion, but it consists mostly of motor nerve fibers⁹⁾. So patients undergoes a facial movement disorder. When you build the expression, the distortion of the face reveals more clearly. In some cases, accompanied by pain in the ear, lacrimal secretion disorders, sensitive hearing and loss of taste.

MET helps the relaxation and strengthening of the muscles. It widely used in chronic diseases, musculoskeletal disorders in korean medicine ¹³⁾. In recent years MET has been used in the field of orthopedic disease. In Chung’s study¹⁹⁾, MET can be used in foot drop patients. In addition, in Ahn’s¹⁵⁾ study, MET be used in nuczal pain patients. In Kim’s¹⁴⁾ study, MET be used in low back pain patients. And Ahn’s²⁰⁾ and Dong’s²¹⁾ study, MET be used in frozen shoulder patients. There are studies on a treatment utilizing Chuna for facial palsy. In Park’s study²²⁾, “Danmuji Anchu Traction technique” be used in acute peripheral facial paralysis patients. And in Jeong’s study²³⁾ Cervical chuna be used in Bell’s palsy patients. Depending on the

Discussion

The cause of the Guanwasa is the bad vigor with similar wind or cold air characteristics. Korean

Table 3. Comparison of Y–Score Between Group A and Group B

Times	Group A	Group B	P-value
Before treatment	6.23 ± 5.76	5.19 ± 6.72	0.63
After 1 week	7.17 ± 6.34	8.84 ± 5.22	0.72
After 2 weeks	12.39 ± 4.94	15.12 ± 3.20	0.04 *
After 3 weeks	17.11 ± 5.31	22.78 ± 3.67	0.01 **

Table 4. Comparison of H–Score Between Group A and Group B

Times	Group A	Group B	P-value
Before treatment	4.11±1.21	4.32±1.98	0.87
After 1 week	3.87±1.36	3.64±1.76	0.63
After 2 weeks	3.20±0.97	3.02±1.03	0.05
After 3 weeks	2.84±1.12	2.23±0.78	0.04*

results of previous research, we tried to improve symptoms of peripheral type of facial palsy through treatment with MET. In the Korean medical treatment, most patients should receive facial muscle exercise according to the guidance of a doctor. It is the practice for moving facial muscles. Facial massage therapy is also confined to the face area. In this study, the scope of treatment was extended to the muscles of neck, upper back and shoulder. Upper trapezius muscle, Sternocleidomastoid muscle, Levator Scapulae muscle and scalenemuscles are composed of the neck, upper back and shoulder. According to the results of this study, the treatment of these muscles were effective for peripheral type of facial palsy.

Research subjects are constituted by 26 men and 34 women men. By age, 10s is 1 people(1.7%), 20s is 5(8.3%), 30s is 5(8.3%), 40s is 11(18.3%), 50s is 17(28.3%), 60s is 19(31.7%) and 70s is 2(3.3%). 60s has the most percentage. The facial palsy was located on the left (Lt) side in 37 patients and on the right (Rt) side in 23 patients. These results is a difference between general statistics about facial palsy. This is estimated to be due to the number of subjects was not much.

Diabetic patients in group A was nine and group B was eleven. These glycated hemoglobin levels (HbA1c) did not exceed 7.0 in admission. They received a blood sugar test four times daily and all results were within normal range. Hypertension patients in group A was ten and group B was eight. They received blood ressure measurement two times daily and all results were within normal range. There was no hyperlipidemia or rheumatoid arthritis patients.

The purpose of MET on facial palsy is to restore of facial movement, prevention of strain and promote of nerve regeneration. Scale that can accurately grasp the degree of paralysis in order to objectively evaluate the effect of treatment is necessary. Yanagihara's score and House-Brackmann

scale are most often used for evaluate of facial palsy.

In this study, we showed a meaningful change in both of the two scales. A week after MET, Yanagihara's score average of Group A is 7.17 ± 6.34 . Yanagihara's score average of Group B is 8.84 ± 5.22 . ($P = 0.72$). Two weeks after MET, Yanagihara's score average of Group A is 12.39 ± 4.94 . Yanagihara's score average of Group B is 15.12 ± 3.20 . ($P = 0.04$). Three weeks after MET, Yanagihara's score average of Group A is 17.11 ± 5.31 . Yanagihara's score average of Group B is 22.78 ± 3.67 . ($P = 0.01$). The patients exhibited a significant difference from 3 weeks after treatment. And a week after MET, House-Brackmann Scale average of Group A is 3.87 ± 1.36 . House-Brackmann Scale average of Group B is 3.64 ± 1.76 . ($P = 0.63$). Two weeks after MET, House-Brackmann Scale average of Group A is 3.20 ± 0.97 . House-Brackmann Scale average of Group B is 3.02 ± 1.03 . ($P = 0.05$). Three weeks after MET, House-Brackmann Scale average of Group A is 2.84 ± 1.12 . House-Brackmann Scale average of Group B is 2.23 ± 0.78 . ($P = 0.04$). The patients exhibited a significant difference from 4 weeks after treatment. This is estimated to be due to general prognosis of facial paralysis. Facial paralysis is hardly improved for a week.

Limitations of the study is the number of samples is small. However, the presumed judging from the results of the study, This study will have the sufficient meanings as prior materials for further research on MET.

Conclusion

Through our research, we obtained the following conclusions. In this study, we have found that the MET is to change the Yanagihara's score and House-Brackmann scale significantly. MET can be used as a treatment related to complete facial palsy. And it is worth to study in further research

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