Rehabilitation of Post-stroke Hemiplegic Patient with Integrative Medicine

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Abstract:

Numerous of stroke survivors are suffering from the body function impairments such as problems with balance or coordination, weakness, and paralysis. We describe a case in which use of integrative medicine rehabilitation for a 52-year-old female patient with ischemic stroke suffered a right hemiplegia, resulting in persistent weakness and problems with muscle control. The patient underwent sequential three healing processes including physical therapy, Thai traditional massage, and acupuncture in total of 10 times, at 2 times per week by professional practitioners. After management with this rehabilitation program, the patient had better effects on stroke recovery evaluating by The Barthel index for activities of daily living, Mini-Mental Status Examination (MMSE) Thai 2002 and muscle power grading. The outcomes of the study evidence that comprehensive integrative medicinal rehabilitation approach has multiple effects on individuals who have poststroke disability or weakness to confer greater rehabilitative benefit.

Keywords: Rehabilitation, Poststroke, Acupuncture, Thai traditional massage

Introduction

Cerebrovascular disease or stroke has become the top three leading cause of mortality in non-communicable diseases which is also the cause of disability in Thai population[1]. Ischemic stroke is the common type of stroke which can be found in elderly people as the report of the Thai Stroke Registry indicating that the mean age of patients at the onset of ischemic stroke in Thailand is around 65 years old[2]. Stroke survivors with mobility limitation, motor dysfunction, cognitive impairment, and poststroke depression are unable to live independently because of disability and leading to physical, emotional, social, and financial problems leading to the dramatic impact on their quality of life (QOL)[3]. Thus,

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the poststroke rehabilitation therapy is recommended to improve the daily activities and quality of life of these patients.

Ischemic stroke is a major type of stroke in Thai population which causes by a blockage in an artery that supplies blood to the brain, leading to damage or even death of brain cells[4]. The damage of brain cells typically impacts limbs and facial muscles of stroke survivors. It's often accompanied by muscle pain, seizures, spasticity and atrophy[5]. The clinical study has shown that the use of herbal medicine and acupuncture along with conventional rehabilitation can reduce injury level and exert a neuroprotective role in ischemic stroke patients[6]. In addition, acupuncture and Thai traditional massage have been reported to stimulate the sensory via multiple efferent pathways of neural systems[7,8]. However, early movement and exercise from physical therapy is recommended to prevent a long-term disability and promoting of neural function[9].

This case report demonstrated use of physical therapy (conventional rehabilitation) together with Thai traditional massage and acupuncture in a female patient suffered from stroke. After management with integrative approach, the patient's neurological condition, mobility and balance have improved drastically without significant side effects.

Case Presentation

A poststroke 52-year-old female (body weight, 86 kg; height, 158 cm) was diagnosed with ischemic stroke which caused her to have a right hemiplegia. Seven months before stroke, she was a physically active person, but suddenly had experienced right-sided weakness and she was admitted to the nearby hospital within 4 hours. After discharge from the hospital, she visited the local hospital for exercise therapy by physiotherapists; however, there was no significant improvement. Therefore, she decided to come to Mae Fah Luang University Hospital for rehabilitation at brain and neurology department by integrative medicine with a chief complaint of right-sided paralysis. She had a history of hypertension as well as hyperlipidemia and the physician prescribed her Enalapril 5 mg and Simvastatin 10 mg per a day as the antihypertensive and antihyperlipidemic drugs, respectively. At the first visit, she could not move her right-sided upper and lower limbs, but she could smile and raise her eyebrows symmetrically. She denied a severe headache or visual disturbances. She had a hard time for information intake and processing such as slow thinking when compared to the pre-stroke time. She could communicate by talking and writing with her left hand. The patient had elevated blood pressure at the first to third time of visiting, after that she had normal vital signs when visited for the rehabilitation program.

Investigation

Blood chemistry tests were examined at the first and tenth time of the rehabilitation program, including HbA1c, eAG, fasting plasma glucose, total cholesterol, triglycerides, LDL-cholesterol, and HDL-cholesterol. The Barthel index for activities of daily living, Mini-Mental Status Examination (MMSE) Thai 2002 and muscle power grading were evaluated at the first, fifth and tenth time of the rehabilitation program.

Treatment

The rehabilitation program was designed by the hospital for disability patients after stroke by integrating three medical professional fields including physical therapy, applied Thai traditional medicine and traditional Chinese medicine. The patients with disability after stroke (less than a year) who don't need any intensive care monitoring by physicians

with medically stable can apply for this integrative medicine rehabilitation program. In this study, all the techniques for the treatments were accepted as clinical care. The combination of three healing processes were delivered to the patient in the same sequence for ten times, two times per week. Initiation of the activity began with a physical therapy including exercise in the hospital gym with some equipments to improve mobility coordination, strengthen muscles and regain range of motion. This session was last for an hour under the supervision and monitoring by physiotherapists. In the next session, the patient received Thai traditional massage (Table 1). Following this, a hot herbal compress was applied to the same massage areas for approximately 40 min. The main ingredient of the herbal compress is *Zingiber cassumunar* rhizome. After that, the patient was taken through the regime of traditional Chinese medicine using acupuncture. The 0.25x40 mm fine needles were inserted into specific 11 acupuncture points (Table 2) based on YangMing meridian lines and Dumai channel of the weak or painful area for 30 min.

Table 1 Step, area and duration of Thai traditional massage treatment

Step	Area and duration
1	Apply pressure on the right leg (beginning from lower leg to upper leg then return to lower leg) and right ankle (press at anterior of ankle joint) for 6 min
2	Apply pressure on the back (along erector spinae muscle from L5 to C7) for 9 min
3	Apply pressure on the lateral side of the right leg (beginning from gluteal area to lateral side of upper and lower leg) for 5 min
4	Apply pressure on the medial side of the right leg (beginning from medial side of upper leg to lower leg) for 5 min
5	Apply pressure on the medial side of the right arm (beginning from middle of medial side of upper arm to anterior of wrist) for 5 min
6	Apply pressure on the lateral side of the right arm (beginning from middle of lateral side of upper arm to middle of lower arm) for 5 min
7	Apply pressure on the right shoulder (upper part of back at posterior shoulder) for 5 min
8	Apply pressure on the right shoulder (lateral side of lower neck and posterior of shoulder) for 5 min

Table 2 Eleven acupuncture points and areas

Point	Areas
BaiHui	Insert the needle at the top of the head at midpoint of the posterior hairline.
TongTian	Insert the needle at the midline of the anterior hairline, lateral to the midline.
Point	**Areas**
FengFu	Insert the needle at the midline of the nape of the neck, above the midpoint of the posterior hairline.
JianYu	Insert the needle at the upper border of the deltoid muscle, in the anterior border of the acromion of the right arm.
QuChi	Insert the needle at the midpoint between the lateral end of the transverse cubical crease and the lateral epicondyle of the humerus of the right arm.
WaiGuan	Insert the needle at the dorsal aspect of the forearm, above the transverse crease of the dorsum of the wrist of the right arm.
HeGu	Insert the needle at the dorsum of the hand, midway between thumb and point fingers of the right hand
HuanTiao	Insert the needle at the junction of lateral 1/3 and medial 2/3 of the line linking the prominence of greater trochanter and the sacro-coccygeal hiatus of the right buttock.
YangLingQuan	Insert the needle at the depression anterior and inferior to the small head of the fibula of the right leg.
ZuSanLi	Insert the needle at the lateral to the anterior crest of the tibia of the right leg.
JieXi	Insert the needle at the midpoint of the transverse crease of the ankle joint, between the tendons of m. extensor digitorum longus and hallucis longus of the right leg.

Results

After the patient completed five weeks of the program, most of her blood chemistry profiles were at normal range at the tenth time of the program, except HbA1c (6.5%), eAG (140.8 mg/dL), fasting plasma glucose (109 mg/dL) (Table 3). Therefore, she was recommended to the physician to monitor and manage her diabetes. Additionally, she was managed to continue with antihypertensive and antihyperlipidemic drugs including Enalapril 5 mg and Simvastatin 10 mg per a day to reduce long-term cardiovascular as well as cerebrovascular mortality and morbidity after stroke[10]. The evaluations of Barthel index and muscle power grading revealed her improvement, especially the weakened right-sided leg and arm as shown in Table 4. The Mini-Mental Status Examination (MMSE-Thai 2002) indicated the normality of her cognitive function at the end of the program.

Table 3 Blood chemistry profile of the patient

Blood tests	Results	
	1st time	**10th time**
Glucose	113 mg/dl	109 mg/dl
Cholesterol	112 mg/dL	99 mg/dL
Triglyceride	108 mg/dL	106 mg/dL
HDL-Cholesterol	52 mg/dL	58 mg/dL
LDL- Cholesterol (Direct)	51 mg/dl	56 mg/dl
HbA1c	6.7 %	6.5 %
eAG	145.9 mg/dL	140.8 mg/dL

Table 4 The evaluation of Barthel index, MMSE-Thai 2002 and motor power

Evaluation forms	Assessments					
	First		**Fifth**		**Tenth**	
Barthel index	40		80		95	
MMSE-Thai 2002	20		23		27	
Motor power of arms	Right Left	0 4	Right Left	0 4	Right Left	3 5
Motor power of legs	Right Left	0 5	Right Left	1 5	Right Left	3 5

Discussion

Most stroke survivors reach a functional plateau within the first 6 months to 1 year after stroke and are left with muscle weakness or motor impairments together with cognitive issues that can persist years in their life[11]. It has been suggested that the combination of medical therapies potential for further recovery remains in stroke survivors who have reached such a plateau and that may accelerate this recovery in greater context[6]. Physical therapy (conventional rehabilitation) together with Thai traditional massage and acupuncture provide the potential therapies to facilitate the recovery for the patient. In this study, the results from the Barthel index for activities of daily living, Mini-Mental Status Examination Thai 2002 and muscle power grading show that integrative medicine is possible for the patient with right hemiplegia to effectively improve the fine motor control and cognitive function through physical therapy together with Thai traditional massage and acupuncture. Another study shows that the application of physical therapy, Thai traditional massage, and herbal medicine assisted the improvement of daily function, pain, mood and sleep pattern in stroke patients[12]. Additionally, acupuncture which has been approved by WHO has shown the potential effect on ischemic stroke

through modulation of different mechanisms originating in the central nervous system[8]. In term of safety for the use of acupuncture and Thai traditional massage, a rare incidence of adverse events or even mild symptoms were reported[13]. The external use of the hot herbal compress is considered safety; however, allergic reaction might occur with some patients. Moreover, as long as acupuncture is performed by trained practitioners using the clean needle technique, it is usually a safe procedure[14]. Taken together, the beneficial results on all outcome measurements during the follow-up period indicated that this integrative rehabilitation approach may contribute to many aspects of stroke recovery.

Conclusion

The results in this case report are promising in poststroke rehabilitation as well as for individuals with preexisting disabilities or neurological conditions that may benefit for them. Moreover, future clinical trials are required to confirm this assertion.

Conflict of interest

The author has declared no conflict of interest.

References

1. World Health Organization. Regional Office for South-East A. WHO country cooperation strategy, Thailand: 2017–2021. New Delhi: World Health Organization. Regional Office for South-East Asia; 2017 2017-05. Report No.:9789746804295 (Thai).
2. Nilanont Y, Nidhinandana S, Suwanwela NC, Hanchaiphiboolkul S, Pimpak T, Tatsanavivat P, et al. Quality of acute ischemic stroke care in Thailand: a prospective multicenter countrywide cohort study. J Stroke Cerebrovasc Dis 2014; 23 (2): 213-9.
3. Alan DL, Colin DM, Majid E, Dean TJ, Christopher JM. Global Burden of Disease and Risk Factors. New York: Oxford University Press; 2006.
4. Suwanwela NC. Stroke epidemiology in Thailand. Journal of stroke 2014; 16 (1):1-7.
5. Cioni G, Sgandurra G, Muzzini S, Paolicelli PB, Ferrari A. Forms of Hemiplegia. In: The Spastic Forms of Cerebral Palsy: A Guide to the Assessment of Adaptive Functions. Milano: Springer Milan; 2010. p. 331-56.
6. Fang J, Chen L, Ma R, Keeler CL, Shen L, Bao Y, et al. Comprehensive rehabilitation with integrative medicine for subacute stroke: A multicenter randomized controlled trial. Sci Rep 2016; 6: 25850.
7. Miyahara Y, Jitkritsadakul O, Sringean J, Aungkab N, Khongprasert S, Bhidayasiri R. Can therapeutic Thai massage improve upper limb muscle strength in Parkinson's disease? An objective randomized-controlled trial. J Tradit Complement Med 2018; 8 (2): 261-6.
8. Chavez LM, Huang SS, MacDonald I, Lin JG, Lee YC, Chen YH. Mechanisms of Acupuncture Therapy in Ischemic Stroke Rehabilitation: A Literature Review of Basic Studies. Int J Mol Sci 2017; 18 (11): 2270-83
9. Hosseini Z-S, Peyrovi H, Gohari M. The Effect of Early Passive Range of Motion Exercise on Motor Function of People with Stroke: a Randomized Controlled Trial. Journal of caring sciences 2019; 8 (1): 39-44.
10. Khan NA, Yun L, Humphries K, Kapral M. Antihypertensive Drug Use and Adherence After Stroke. Stroke 2010; 41 (7): 1445-9.
11. Hatem SM, Saussez G, Della Faille

M, Prist V, Zhang X, Dispa D, et al. Rehabilitation of Motor Function after Stroke: A Multiple Systematic Review Focused on Techniques to Stimulate Upper Extremity Recovery. Front Hum Neurosci 2016; 10: 442.
12. Abdul Rani AA, Ab Ghani RM, Shamsuddin S, Abdullah Z, Abdul Halim NH, Mustapha N, et al. Massage therapy for improving functional activity after stroke. Cochrane Database of Systematic Reviews 2015 (10).
13. Wiwanitkit V. Thai traditional massage: Issues causing possible adverse effects. Ancient science of life 2015; 35 (2): 122-3.
14. Chan MWC, Wu XY, Wu JCY, Wong SYS, Chung VCH. Safety of Acupuncture: Overview of Systematic Reviews. Scientific Reports 2017; 7 (1): 3369.