MEDS Public Health and Preventive Medicine (2021) 1: 1-7
Clausius Scientific Press, Canada
DOI: 10.23977/phpm.2021.010101
ISSN 2616-1915

Effects of 12-type Guidance Method Combined with Prokin Balance Training Instrument on the Balance Function and Walking Ability of Stroke Patients with Hemiplegia

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Keywords: stroke; Guben Yijinjing twelve-type guidance method; Prokin balance training device; balance function; walking ability

Abstract: Purpose: To observe the effect of Guben Yijinjing twelve-type guidance method combined with Prokin balance training device on balance function and walking ability of stroke patients with hemiplegia. Methods: 60 stroke patients who met the inclusion criteria were randomly divided into experimental group (30 cases) and control group (30 cases). The control group adopts conventional rehabilitation training methods, and the experimental group uses the Guben Yijinjing twelve-type guidance method on this basis and Prokin balance training device for rehabilitation; the control group and experimental group use Fugl before treatment and 8 weeks after treatment --Meyer balance scale (balance subscale of the Fugl-Meyer Test, FM-B), Berg Balance Scale (BBS), FAC walking function (functional ambulation category scale, FAC) and ATE proprioception index (Average Trace Error, ATE) difference average evaluation. Results: Compared with the control group, the experimental group has significantly improved FMB value, BBS value, FAC value and A. T. E index of the patients than the control group, and the difference in the improvement value is statistically significant ($p < 0.05$). Conclusion: The Guben Yijinjing twelve-type guiding method combined with Prokin balance training device can effectively improve the balance function of stroke patients with hemiplegia, and have a significant role in improving the patients' walking ability, proprioception ability, and activities of daily living.

1. Introduction

Stroke belongs to the category of "stroke" in traditional Chinese medicine. At present, the incidence of stroke in my country is increasing year by year. Because of its high morbidity, disability rate (up to about 75%), and high mortality, it has become one of the primary diseases that endanger human health [1]. With the continuous improvement of medical diagnosis and treatment technology, the clinical treatment of stroke has also been improved, and its fatality rate has gradually shown a downward trend, but the disability rate caused by stroke has remained high. The ability of daily

living and the later return to society brought serious inconvenience [2]. Finding an effective rehabilitation treatment method and treatment method to relieve the pain caused by disability is an urgent problem in the field of post-stroke rehabilitation. The Yi Jin Jing, one of the national intangible cultural heritage, is based on the theory of qi and blood and meridian in traditional Chinese medicine. It achieves the purpose of strengthening the muscles and strengthening the bones and nourishing the viscera by stretching the muscles and bones, adjusting the breath, and maintaining the harmony. The practice of the Guben Yijinjing Twelve-Type Guidance Method has a positive effect on improving the flexibility and ductility of muscles, tendons and body ligaments [3]. Prokin balance training instrument plays a coordinated control role on the patient's pressure center, and also plays a corrective role in controlling the patient's balance ability, which can effectively improve the stability of the body. The Prokin balance training instrument analyzes the results of human balance training and data feedback, and can provide training guidance for patient rehabilitation in a targeted manner [4]. This article intends to observe its therapeutic effects on the balance function and walking ability of stroke patients with hemiplegia by combining the practice of the ancient Yijinjing twelve-type guiding method with modern rehabilitation techniques.

2. Materials and Methods

2.1 Clinical data: 60 patients who met the following inclusion criteria admitted to Kanghua Rehabilitation Hospital in Hefei City, Anhui Province (1) Cerebral infarction or cerebral hemorrhage of the internal carotid artery system confirmed by CT or MRI; (2) The patients were all first-time or Although there is a history of previous attacks, the vital signs after stroke are relatively stable and no neurological dysfunction remains. (3) Hemiplegic patients and those with balance and proprioception disorders; (4) Brunnstrom grading of the upper and lower limbs of the enrollees, Patients with level 3 or higher who can complete the Prokin balance assessment for the first time (5) Those who are ⩽70 years old; (6) Those with stable blood pressure; (7) The diagnostic criteria must comply with the "Encephalopathy Emergency Collaboration Group of the State Administration of Traditional Chinese Medicine" in 1996 Standards for Diagnosis and Efficacy Evaluation of Stroke (Trial). The patients meeting the above inclusion criteria were randomly grouped according to gender, age, and type of disease, and divided into experimental group and control group, each with 30 people. By comparing the general conditions of the two groups of patients, there was no significant difference (P>0.05), and the two groups were comparable for treatment. See Table 1.

Table 1: Comparison of general patient data

Group (n=30)	Gender		Age (years)	Etiology Focus		focus of infection	
	Male	Female		Cerebral Infarction	Cerebral Hemorrhage	left right	right
Experimental group	21	9	59.8±7.3	16	14	13	17
Control group	19	11	61.3±8.3	19	11	12	18
$\chi 2/t$	0.3		-0.75	0.617		0.069	
P	0.584		0.456	0.432		0.793	

During the experiment, patients with the following conditions will be excluded from the group, and those who meet the inclusion criteria will be added again. (1) Patients who underwent thrombolytic therapy and intracerebral hemorrhage surgery; (2) Patients with subarachnoid hemorrhage, cerebral ischemic transient attacks and reversible ischemic neurological deficits; (3) Experimental process The condition of middle-aged patients deteriorated, accompanied by new infarcts or bleeding points, severe cerebral edema or coma, and other unstable conditions; (4) Those with decreased or failure of all important organs; (5) Caused by organic diseases Those with brain injury; (6) Those with a certain degree of cognitive impairment who cannot perform balance exercises, and those with MMSE score <23 points. Rehabilitation treatment termination criteria: (1) The patient has severe complications during the treatment; (2) The patient cannot perform Prokin balance training; (3) The patient and his family refuse the experiment.

2.2 Treatment method: The first experimenter and the control group received conventional drug treatment. The two groups of patients received interventional rehabilitation after their vital signs were stable. The control group received rehabilitation training for joint range of motion, muscle tolerance, balance function, and walking ability.

On the basis of the control group, the experimental group added the exercises of the Guben Yijinjing twelve-type guidance method and the feedback training of the Prokin balance instrument. The total training time of the patients in the control group and the experimental group was the same, both were 1 time/d, 40 minutes /Time, 4 weeks as a course of treatment. After 10 minutes of regular rehabilitation training, the experimental group will join 30 minutes of Yi Jin Jing exercises and Prokin balance training.

2.2.1 Yijinjing rehabilitation training method: the first stage: imagination training: the patient's eyes are slightly closed, relax and imagine the basic hand styles and footwork of the ancient Yijinjing twelve-type guidance method; the second stage: exercise period: Training is conducted in the rehabilitation treatment room of Kanghua Rehabilitation Hospital from 9:00 to 10:00 every day. To ensure the safety of patients, family members are required to accompany them. The frequency of training time is once a day, 15 minutes each time.

2.2.2 Prokin balance instrument feedback training, first conduct the initial proprioception assessment of the patient, after the initial proprioception assessment is completed, the system will automatically recommend a rehabilitation trace suitable for the trainer, and the operator will recover the patient through the trace Training includes: dorsiflexion-toe flexion exercises, varus exercises, etc. Training time frequency: 1 time a day, 15 minutes each time.

After 8 weeks of training, the data is collected: the evaluation is completed within the specified 120 s, the computer automatically generates the chart results, and records the error of the average trajectory during the training and the time-consuming value of the evaluation.

2.3 Evaluation method: Berg Balance Ability Scale, Fugl-Meyer Balance Function Scale, and Holden Walking Function Classification (FAC) are used to assess walking function, (the better the walking ability of grade 0-5, the higher the grade), which are different from treatment Evaluation is performed before and after treatment. All the above evaluations are evaluated by blind method. To ensure the authenticity and reliability of the data, the participating evaluators are all rehabilitation therapists who are not participants of the project to judge the curative effect.

2.4 Statistical analysis: Use SPSS 17.0 statistical software for statistical analysis, and data are expressed as mean ± standard deviation. $P<0.05$ indicates significant difference; $P<0.01$ indicates highly significant difference.

3. Results

After a period of treatment, the functions of FMB, BBS, FAC, and ATE in the two groups have been significantly improved, which is statistically significant. See Table 2 and Table 3.

Table 2: Comparison of rehabilitation scores between the two groups of patients before and after treatment

Group n=30		FMB	BBS	FAC	ATE
Experimental group	Before treatment	7.55±2.67	19.45±3.6	3.16±1.87	2.26±1.81
	After treatment	11.05±2.08	47.35±3.48	4.58±1.78	1.41±1.38
	t	-6.749	-36.86	-3.528	2.366
	P	0	0	0.001	0.022
Control group	Before treatment	7.35±2.35	19.45±3.73	2.9±1.29	2.25±1.78
	After treatment	9.4±1.5	30.35±4.59	4.22±2.33	1.55±1.25
	t	-4.484	-11.944	-3.191	2.165
	P	0	0	0.003	0.035

It can be seen from Table 2 that before rehabilitation, the experimental group was compared with the control group. There was no significant difference in FMB value, BBS value, FAC ability, and ATE index (P>0.05), indicating that the grouping is balanced and has certain Comparability. After 8 weeks of rehabilitation training, the index data of the two groups were significantly higher than before treatment (P＜0.01), and the data of the experimental group was significantly higher than that of the control group (P＜0.05), indicating that rehabilitation training is better for both groups Therapeutic effect, but the effect of Yijinjing combined with Prokin balance instrument training is more significant.

Table 3: Comparison of functional improvement between experimental group and control group

Group n=30	FMB	BBS	FAC	ATE
Experimental group	4.8±2.02	29.2±4.15	4.82±1.54	1.36±1.45
Control group	3.8±2.23	11.8±3.71	3.88±1.66	1.5±1.7
t	2.085	20.47	3.206	-0.597
P	0.041	0	0.002	0.553

It can be seen from Table 3 that through the comparison of the two groups, the FMB value, BBS value, and FAC ability of the experimental group were significantly improved compared with the control group after different rehabilitation treatments (P <0.05; P < 0.01), there is no significant difference in the index of ATE (P>0.05). The data of the experimental group was significantly better than that of the control group, indicating that although rehabilitation training has a better therapeutic effect on the functional improvement of the two groups, the effect of Yijinjing combined with Prokin balance instrument training is particularly significant.

4. Discussion

Stroke, due to its acute onset and dangerous condition, has become the first cause of death in my country, and the mortality and disability rate is higher than that of developed countries in Europe and America [5]. In recent years, with the improvement of science and technology and the popularization of diagnosis and treatment technology, the death rate of stroke has been significantly reduced through the treatment of arterial thrombosis [6-8], but different degrees of sequelae caused by stroke It still exists, the reason is that it is due to cerebral hemorrhage or cerebral infarction disease because of its rapid progress, which can quickly damage peripheral nerves and cells. It leads to the destruction of the central nervous system, induces defects in the brain nerve structure, and affects the body's balance function and proprioception. The loss or decline of balance ability can easily lead to falls. According to incomplete statistics, about 34% of patients with neurological disorders have at least one fall in a year. Once they fall, it is easy to relapse or worsen the brain disease [9,10]. Modern rehabilitation medicine theory and clinical practice have proved that timely and effective rehabilitation training in the early stage of stroke plays an important role in improving the patients' ability of daily living and reducing the disability of patients' balance function.

Prokin balance feedback training instrument takes into account a variety of balance assessment and functional training. Patients can use the instrument to perform balance testing and trunk balance control training [11,12]. The patient stands or sits on the balancer, and the machine evaluates the control feeling of its balance ability. At the same time, the Prokin balance feedback training device can also analyze the center of gravity of the patient's posture swing amplitude. The balance feedback training device not only has the function of assessing the patient's balance, but also has the ability to train the patient's balance function. However, because the pathological characteristics of stroke are from the inside to the outside, the treatment with only instruments cannot reach the ideal state. The main function of the twelve-type guiding method of the ancient Yi Jin Jing is to strengthen the muscles and bones. "Yi" has the meaning of change and change. "Tin" refers to muscles and fascia in medicine. The main feature of Yi Jin Jing is the organic combination of movement and static. Inner stillness has the power to adjust the heart and breath, and outer movement has the ability to strengthen muscles and bones. A large number of clinical studies have also confirmed that Yijinjing can effectively improve the balance function of stroke patients and the recovery of limb function [13,14]. Because the practice of Yijinjing requires certain benefits for rehabilitation after stroke [15,16], in recent years, the therapeutic value of Yijinjing in rehabilitation medicine has been gradually valued [17,18]. The organic combination of Yijinjing and Prokin training device can promote the reconstruction of patients' balance function, which is conducive to improving the recovery of proprioception and motor function of stroke patients.

This experiment showed that there was no significant difference in various indexes between the two groups before rehabilitation ($P>0.05$), but after 8 weeks of rehabilitation training, the index data of the two groups were significantly higher than those before treatment ($P< 0.01$), the balance function and walking ability of the experimental group were significantly improved, and the improvement of various indicators was significantly better than that of the control group. There was a significant difference between the two groups ($P<0.05$). It shows that the patient's static balance index can be restored to a better level after Yijinjing combined with Prokin balance instrument training treatment, so that the central nervous system function of the cerebral ischemic lesion is improved, and then the sequelae of poor balance ability can be reduced. It shows that Yi Jin Jing exercises training can significantly improve the static balance ability of stroke patients.

The scores of all scales in the experimental group are higher than those in the control group, and the ATE value is lower than that in the control group, indicating that the patients have good self-control ability in exercise, balance, sensation, joint mobility or proprioception. The time is lower

than the control group, indicating that the patient can maintain better exercise ability and stability. The various indexes of the experimental group show that the Guben Yijinjing twelve-type guiding method combined with the Prokin balance training device has a complementary effect on the functional recovery of stroke patients and can promote the rehabilitation of stroke patients.

5. Conclusion

Both the acute recovery period and the chronic recovery period of stroke should arouse the attention of rehabilitation physicians, family members and patients themselves. In addition to prescribing corresponding drug treatment prescriptions, there should also be targeted non-drug prescriptions. Among them, the Chinese traditional guiding method has the corresponding rehabilitation treatment effect. This research takes into account the functional rehabilitation treatment methods in the traditional guidance method and the treatment methods of related instruments. The characteristic of this research lies in applying the twelve forms of the classical Yijinjing to the balance function of stroke patients, which includes not only the lower limbs, but also the stability exercises of the upper limbs and trunk. This study shows that the static balance index of the patient can be restored to a better level after the treatment of the twelve-form combination of the Guben Yijinjing with the Prokin balance training device, which improves the central nervous function of the cerebral ischemic focus and reduces the sequelae of poor balance ability. It shows that Yi Jin Jing exercises training can significantly improve the static balance ability of stroke patients.

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