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Clinical Study on Treatment of Parkinson's Disease using Electroacupuncture Combined with Rehabilitation

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Abstract: **Objective**: To study the clinical effect of electroacupuncture combined with rehabilitation in patients with Parkinson's disease. **Methods:** Twenty patients with Parkinson's disease were divided into observation group and control group according to the time of admission. In each group, 10 cases were treated with electroacupuncture in the control group. The clinical effects of the two groups were compared. **Results:** After treatment, the Wechsler comprehensive assessment scale, Barthel index and UPDRS III score of the observation group were significantly higher than the control group (p <0.05). The total effective rate was 90% in the observation group and 60% in the control group. There was significant difference in the total effective rate between the two groups (p <0.05). **Conclusion:** Treatment of Parkinson's disease with electroacupuncture combined with rehabilitation is effective and can improve the clinical symptoms and quality of life of patients.

Key Words: Parkinson's disease; Electroacupuncture; rehabilitation; Clinical effect

Parkinson's disease (PD) is one of the nervous system diseases with a very high incidence. Currently, there is still no cure for PD. The main goal of clinical treatment is to alleviate the clinical symptoms and improve quality of life of patients. Many clinical studies have reported that more than 40% of patients with PD are mainly treated with electroacupuncture, and nearly 80% of patients with symptoms improved, a small number of patients with improved motor score, and no adverse reactions. Electroacupuncture treatment is commonly used for clinical treatment of PD. This study aims to analyze the clinical effects of electroacupuncture combined with rehabilitation in patients with Parkinson's disease.

1. Materials and Methods

1.1 General Information

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Twenty patients with PD who were treated in our hospital from January 2011 to January 2016 were divided into

observation and control groups. In the observation group (n=10), there were 6 males and 4 females, age ranged from 54-86 years and mean age was (59.28 ± 4.39) years. The duration of disease was from 1-13 years, mean (5.17 ± 0.68) years. According to H-Y stage, there were 5 cases of grade II, 3 cases of grade III, and 2 cases of grade IV. In the control group (n=10), there are 5 males and 5 females, age ranged from 53-87 years and mean age was (59.34 ± 4.45) years. The duration of disease was from 1-12 years, mean (5.04 ± 0.61) years. According to H-Y stage, the stage of disease was 4 cases of grade II, 3 cases of grade III, 3 cases of grade IV. General information of two groups of patients showed no significant difference (p> 0.05).

1.2 Methods

Electroacupuncture treatment was given to the control group. G6805-I electroacupuncture with 0.38 mmX (40-75) mm filiform needle was selected for the treatment. After the patient was seated, the point of penetration of the scalp was chosen. The needle and the scalp were kept at an angle of 15°, while the piercing depth was 1.5 cm. The filiform needle was pierced at a certain point and maintained the speed at 200 r/min speed for 60s. The electroacupuncture treatment device was connected and dense wave stimulation was selected. The period of electroacupunture was 30 min, 5d/1 course with the interval of 1d.

The observation group was given with electroacupuncture treatment combined with rehabilitation. The electroacupunture treatment was same as previously described. The grade II-III patients were given active exercise. The grade IV patients were given active exercise combined with passive exercise. The passive exercise focused on massage and passively stretching of restricted joints and muscles (1 time/d, 30 min/time). Active exercise focused on the neck exercise, breathing exercise, gait exercise, upper and lower limb coordination exercise, trunk exercise and fine hand movements (2 times/d, 30 min/time).

1.3 Observation Indicators

Symptoms of muscular rigidity, tremor, posture, gait and synergistic action were evaluated by the Wechsler Comprehensive Rating Scale. The higher the score, the more serious the symptoms were. Activities of daily living (ADL) was evaluated by the modified Barthel Index. The higher the score, the higher the patient's ADL. The motor signs of the patients were evaluated using the Unified Parkinson's Disease Rating Scale (UPDRS III), where the higher the score, the more severe the symptoms. The clinical efficacy of the patients was judged according to the rate of improvement of exercise. UPDRS III score before treatment was subtracted from that after treatment, divided by the UPDRS III score before treatment and then multiplied by 100% in order to obtain the rate of improvement. If the improvement rate was more than 50%, then the treatment was judged to be significantly effective; if the improvement rate was between 20%–49%, the treatment has progress; if the improvement rate was less than 20%, the treatment was judged as invalid.

1.4 Statistical Analysis

Data were analyzed using SPSS13.0 and excel software Data was expressed as mean±s and X^2 test was carried out. Comparison of patients was carried out using t-test. P <0.05 means the difference was statistically significant.

2. Results

2.1 Comparison of clinical efficacy

Table 1 Comparison of clinical efficacy (n, %)

Group	*n*	Effective	Improved	Ineffective	Total Rate
Control group	10	3（30.00）	3（30.00）	4（40.00）	6（60.00）
Observation group	10	8（80.00）	1（10.00）	1（10.00）	9（90.00）
p	-	<0.05	<0.05	<0.05	<0.05

Table 1 shows that the total effective rate in the observation group was 90%, while the total effective rate in the control group was 60%. The total effective rate in two groups was significantly higher than that in the control group (p <0.05).

2.2 Wechsler comprehensive rating scale

Table 2 Comparison of Wechsler comprehensive rating scale

Projects	Control group（*n*=10）		Observation group（*n*=10）	
	Before treatment	After treatment	Before treatment	After treatment
Muscle rigidity	2.18±0.72	2.03±0.52	2.17±0.78	1.69±0.73
Tremor	2.59±0.76	2.12±0.68	2.57±0.79	1.82±0.74
Posture	2.69±0.72	2.26±0.54	2.68±0.78	1.93±0.61
Gait	2.74±0.68	2.22±0.25	2.72±0.69	1.89±0.73
Synergistic action	2.45±0.58	2.04±0.45	2.44±0.59	1.93±0.72

Table 2 shows no significant difference in the Wechsler comprehensive rating scale between the two groups before treatment (p> 0.05). After treatment, the Wechsler comprehensive rating scale improved in both groups (p <0.05). After treatment, the Wechsler comprehensive rating scale was significantly higher in the observation group than that in the control group (p <0.05).

2.3 Barthel index score and UPDRS III score

Table 3 Comparison of Barthel index score and UPDRS III (mean±s, point)

Projects	Control group（*n*=10）		Observation group（*n*=10）	
	Before treatment	After treatment	Before treatment	After treatment
Barthel Index score	42.12±7.62	45.06±7.52	42.15±7.78	53.62±7.72
UPDRS III score	52.43±9.76	47.43±9.68	52.52±9.79	31.84±9.76

Table 3 shows that both Barthel index and UPDRS III score were not significantly different between the two groups before treatment (p> 0.05). After treatment, both Barthel index and UPDRS III score were improved significantly (p < 0.05). After treatment, the scores of Barthel index and UPDRS III score in the observation group were significantly higher than those in the control group (p <0.05).

3. Discussion

The main clinical feature of PD is extrapyramidal dyskinesia, while the typical clinical symptoms are including muscle rigidity, movement retardation, resting tremor and abnormal postural gait. PD is common and the incidence rate in increasing in China with an increasing trend of population aging. The incidence and age of the population was positively correlated with high incidence of PD. PD can lead to dysfunction and even disability of patients. PD not only affects the quality of life of patients, but also increases the financial burden of patients. Besides, government spends a lot of financial and material resources to treat the disease every year. Therefore, effective methods for treatment of PD is the current focus of the neurological clinical research.

Current clinical treatment methods of PD include surgical treatment, gene therapy, drug therapy, cell transplantation therapy and acupuncture therapy. The acupuncture treatment has the advantage of convenient, simple and effective. At present, there are a lot of experimental and clinical research reports on the treatment of PD by electroacupuncture. Previous reports showed that electroacupuncture treatment can improve the clinical symptoms of PD patients, protect and repair dopamine neurons, reduce excitatory amino acid release, and accelerate the expression of neurotrophic factors. In addition, some researchers have also pointed out that electroacupuncture treatment signifixantly improves the clinical symptoms of PD patients, such as tremor, muscle rigidity, and micrographia. Electroacupuncture treatment has achieved good clinical efficacy because: First, the electroacupuncture can increase tyrosine hydroxylase activity, thereby increasing the amount of dopamine production. The main rate-limiting enzyme is monoamine transmitter, which is directly related to the activity of monoamine transmitter. Second, electroacupuncture can promote dopaminergic presynaptic terminals and increase dopaminergic reuptake. At the same time, electroacupuncture can also regulate the neurotransmitter content in the central pathway of the brain, especially increase the dopamine content. Third, the electroacupuncture can inhibit the activity of monoamine oxidase, slow down dopamine metabolism, and increase the dopaminergic energy content. Fourth, electroacupuncture can increase the superoxide dismutase and lipid peroxide content.

PD is one of the complex diseases involved in multiple organ systems, including typical motor symptoms and also non-motor symptoms (such as sleep disorders, fatigue, cognitive dysfunction and constipation). PD can cause serious impact to the quality of life of patients. Thus, rehabilitation cannot be ignored in patients. Rehabilitation is one of the common methods of clinical treatment of PD. The training model can accelerate the regeneration rate of related neuronal axons, promote dendrites germination and new contact, and construct new neural network. Moreover, rehabilitation can achieve the effect of transfer and reconstruction of central nervous system function, activate the secondary pathway, suppress abnormal low central control activities, and ultimately improve the movement disorders. In addition, good rehabilitation training can also help patients to resolve physical barriers and reduce the risk of sequelae. Meanwhile, rehabilitation in patients with active exercise can promote involuntary movement inhibition, and further improve the patient's extensor and flexor tension to prevent rigidity caused by muscle stiffness. Rehabilitation can also improve the patient's muscle rigidity, prevent muscle weakness and atrophy and joint deformity coordination, and improve the psychological effect of patients to overcome the negative emotions such as depression. Therefore, electroacupuncture combined with rehabilitation training can achieve significant clinical efficacy.

In this study, the total effective rate of patients in the electroacupuncture combined with rehabilitation training group, the Wechsler comprehensive rating scale, Barthel index and UPDRS III score after treatment were significantly better than those in the control group. In conclusion, the clinical efficacy of electroacupuncture combined with rehabilitation training is good in the PD patients. Meanwhile, combination of treatments improves the clinical symptoms and quality of life.

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