

NURSING INFLUENCES ON MOTOR FUNCTION RECOVERY IN PATIENTS ON POST STROKE HEMIPLEGIA



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INFLUÊNCIAS DA ENFERMAGEM NA RECUPERAÇÃO DA FUNÇÃO MOTORA EM PACIENTES COM HEMIPLEGIA PÓS-AVE

INFLUENCIAS DE LA ENFERMERÍA EN LA RECUPERACIÓN DE LA FUNCIÓN MOTORA EN PACIENTES CON HEMIPLEJIA POST ICTUS

Yanfang Zhai¹
(Medicine Professional)
Lili Song¹
(Medicine Professional)
Ping Tong¹
(Medicine Professional)
Ke Peng¹
(Medicine Professional)

1. Chinese Academy of Medical Sciences, Institute of Geriatric Medicine, National Center of Gerontology, Department of Emergency of Beijing Hospital, Beijing, China.

Correspondence:

Yanfang Zhai
Beijing, China. 100730.
zhaiyanfang666@163.com

ABSTRACT

Introduction: The motor function of the lower limbs is of great importance for the recovery of hemiplegics post stroke. **Objective:** Study the influence of nursing during motor rehabilitation on the recovery of lower limb motor function in patients with hemiplegia after stroke. **Methods:** In this study, the 28 patients were treated with nursing intervention for motor rehabilitation in the experimental group, while the control group was treated only with a conventional rehabilitation program, and the results were compared before and after the experiment. **Results:** After eight weeks of the experiment, the FMA-LE scale score in the experimental group increased from 19.65 to 30.51; the TUGT assessment score increased from 38.45s to 28.61s; the FAC rating test was upgraded from 1.86 to 2.98. The maximum weight percentage on the hemiplegic side increased from 27.54±10.14% to 79.51±7.52%; the fastest 5m return speed increased from 0.22±0.03m/s to 0.54±0.07m/s. The improvement effect was less evident in the control group. **Conclusion:** Rehabilitation nursing promotes a positive effect on improving lower limb motor function in hemiplegic patients. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Rehabilitation Nursing; Hemiplegia; Lower Extremity.

RESUMO

Introdução: A função motora dos membros inferiores é de grande importância para a recuperação de hemiplégicos pós-acidente vascular encefálico. **Objetivo:** Estudar a influência da enfermagem durante a reabilitação motora na recuperação da função motora dos membros inferiores em pacientes com hemiplegia após o acidente vascular encefálico. **Métodos:** Neste estudo, os 28 pacientes foram tratados com intervenção de enfermagem para reabilitação motora no grupo experimental, enquanto o grupo controle foi tratado apenas com um programa de reabilitação convencional, sendo que os resultados foram comparados antes e depois do experimento. **Resultados:** Após 8 semanas do experimento, a pontuação da escala FMA-LE no grupo experimental aumentou de 19,65 para 30,51; a pontuação da avaliação TUGT aumentou de 38,45s para 28,61s; o teste de classificação FAC foi atualizado de 1,86 para 2,98. A porcentagem máxima de peso do lado hemiplégico passou de 27,54±10,14% para 79,51±7,52%; a velocidade de retorno mais rápida de 5m passou de 0,22±0,03m/s para 0,54±0,07m/s. O efeito de melhoria foi menos evidente no grupo controle. **Conclusão:** O trabalho de enfermagem de reabilitação tem um efeito positivo na melhoria da função motora dos membros inferiores em pacientes com hemiplegia. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Enfermagem em Reabilitação; Hemiplegia; Membros Inferiores.

RESUMEN

Introducción: La función motora de los miembros inferiores es de gran importancia para la recuperación de los hemipléjicos post ictus. **Objetivo:** Estudiar la influencia de la enfermería durante la rehabilitación motora en la recuperación de la función motora de los miembros inferiores en pacientes con hemiplejia post ictus. **Métodos:** En este estudio, los 28 pacientes fueron tratados con intervención de enfermería para la rehabilitación motora en el grupo experimental, mientras que el grupo de control fue tratado sólo con un programa de rehabilitación convencional, y se compararon los resultados antes y después del experimento. **Resultados:** Tras 8 semanas de experimento, la puntuación de la escala FMA-LE en el grupo experimental aumentó de 19,65 a 30,51; la puntuación de la evaluación TUGT aumentó de 38,45s a 28,61s; la prueba de valoración FAC se mejoró de 1,86 a 2,98. El porcentaje de peso máximo en el lado hemipléjico aumentó de 27,54±10,14% a 79,51±7,52%; la velocidad de retorno más rápida de 5m aumentó de 0,22±0,03m/s a 0,54±0,07m/s. El efecto de mejora fue menos evidente en el grupo de control. **Conclusión:** El trabajo de enfermería de rehabilitación tiene un efecto positivo en la mejora de la función motora de las extremidades inferiores en pacientes con hemiplejia. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Enfermería en Rehabilitación; Hemiplejía; Extremidades Inferiores.



INTRODUCTION

Stroke has become a serious global health problem, and its incidence rate, mortality, disability and recurrence rates are high in humans.¹ With the improvement of medical services at this stage, most of the patients can survive after stroke through emergency treatment, but nearly 50% of the survivors will still have physical dysfunction of different severity in the later stage, which will seriously affect the quality of their daily life.² Physical dysfunction also brings huge economic burden and psychological pressure to patients and their families. Therefore, rehabilitation after stroke is becoming more and more important.³ Among them, the main problem faced by stroke hemiplegia patients is the lower limb motor dysfunction. The recovery of lower limb motor function can greatly improve the psychological state and quality of life of hemiplegic patients.⁴ In recent years, motor rehabilitation training methods have been applied to the field of nerve rehabilitation, and the effectiveness of its training methods on motor function of stroke patients with hemiplegia and its clinical application have gradually received attention.⁵ Therefore, based on the attention paid to the problem of stroke hemiplegia at the present stage, this experiment studies the effect of exercise rehabilitation training on the balance and lower limb function of stroke hemiplegia patients.⁶ The purpose is to provide clinical basis for the application of motor control training in the rehabilitation of hemiplegia after stroke, so as to evaluate the relevant mechanism.

METHOD

Experimental object

The subjects of this study were inpatients in the rehabilitation department of a hospital. Before the start of the study, the subjects were recruited for some existing patients in the department. The patients who volunteered to register were screened through questionnaires and interviews. The study and all the participants were reviewed and approved by Ethics Committee of Chinese Academy of Medical Sciences (NO.CAMS020FD). Finally, 28 patients who were in the recovery period after stroke hemiplegia were selected as the subjects of this study. The subjects were all 40-65 years old, the course of disease was 35-55 days, the vital signs were normal and stable, there was no serious respiratory system, cardio-cerebrovascular disease, no serious osteoporosis and movement disorder, and it was suitable for exercise rehabilitation training. All subjects have certain lower limb dysfunction, and the walking distance of the auxiliary support alone can exceed 6 meters. Before the start of the experiment, both the author and his family members signed the informed consent form, volunteered to participate in the exercise and training related to the experiment, and followed the experimental guidance requirements. The 28 patients selected in this paper were randomly divided into experimental group and control group. The basic information of the two groups is shown in Table 1. It meets the basic requirements of the control experiment.

Experimental method

The experiment was conducted for 8 weeks, with 5 times of training from Monday to Friday. The total duration of each rehabilitation training was 30 minutes in the morning and 30 minutes in the afternoon, a total of 1 hour. During the period, the difference between the experimental group and the control group is that the experimental group needs to carry out the intervention of exercise rehabilitation nursing, that is,

Table 1. Basic characteristics of hemiplegic patients with stroke in two groups.

Group	Number of cases	Age (years)	Course of disease (days)
Experimental group	14	50.793±10.6214	44.112±7.5019
Control group	14	53.211±11.5749	41.568±8.1581

exercise rehabilitation nursing with the routine rehabilitation program, and exercise rehabilitation training includes simple balance exercises, sitting control exercises, joint flexion and extension exercises, and step training. The control group only received routine rehabilitation programs, mainly physical therapy, including massage, massage, acupuncture, physical therapy and other methods.

Experimental evaluation

The evaluation of the subjects mainly used three scales: FMA-LE lower limb part, TUGT timing test and FAC grading test, as well as two lower limb motor ability indicators: the maximum weight bearing percentage of the hemiplegic side and the fastest turn back speed of 5m. The lower limb part of FMA-LE is mainly used to evaluate the lower limb motor ability of patients, including limb reflex, cooperative motion and coordination function. The higher the score, the better the lower limb motor function. TUGT timing test is mainly used to evaluate the basic activity ability of the patient. The time is measured in seconds. It is mainly used to measure the time required to experience several processes such as standing up, walking, turning, and returning during the 3-meter movement. The FAC grading test is mainly used to evaluate the walking ability of patients. It is divided into five levels in terms of progression. The higher the level is, the higher the walking ability is. The maximum weight bearing percentage of the hemiplegic side and the fastest turning speed of 5m can also evaluate the lower limb motor ability of the patient, and can also reflect the rehabilitation status of the patient.

Precautions for experiment

During the whole process of rehabilitation training, the patient's state should be monitored in time to ensure that the patient's breathing, heart rate and mood are in normal state, and the intervention measures should be adjusted according to the actual situation of the patient. Gradually increase the intensity and difficulty of training during the training process to ensure that the patients can adapt to the training intensity. Ensure that the whole experimental training process conforms to the relevant ethical requirements of rehabilitation treatment.

RESULTS

After an 8-week intervention experiment, the test results of the FMA-LE scale for the changes of lower limb motor function of the subjects were statistically analyzed, and the results are shown in Figure 1.

The curve in Figure 1 can clearly show the difference of lower limb motor ability between the experimental group and the control group during the 8-week training. There was no significant difference between the two groups in the FMA-LE scale before the experiment. With the progress of the experiment, the scores of the patients in the experimental group began to be significantly higher than those in the control group,

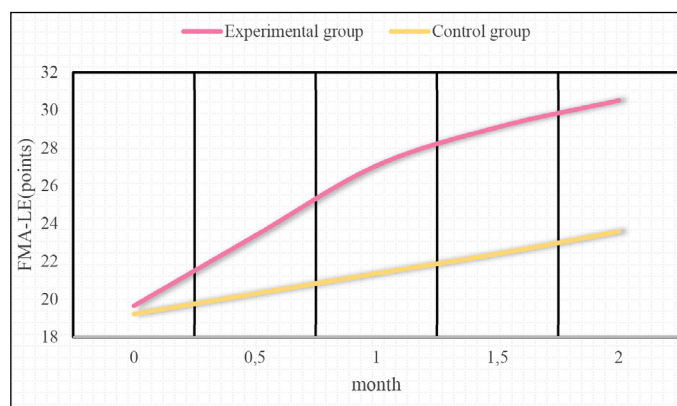


Figure 1. Changes of lower limb motor function during treatment: FMA-LE as the judgment standard.

and the gap continued to expand. On the whole, the growth rate of FMA-LE scores of patients in the experimental group was significantly higher than that in the control group, showing a trend of rapid growth in the first four weeks. The score of the experimental group was 19.65 before the experiment, increased to 23.361 in the second week, 27.063 in the fourth week, 29.1 in the sixth week and 30.515 in the eighth week. In contrast, the growth rate of the control group was slow and the overall growth rate was small. The score of the control group was 19.22 before the experiment, increased to 20.291 in the second week, 21.362 in the fourth week, 22.402 in the sixth week and 23.581 in the eighth week. Figure 1 shows that the improvement effect of motor rehabilitation training on the lower limb motor ability of stroke hemiplegic patients is better than that of general rehabilitation training, which can improve the overall coordination function of the limbs.

The results of TUGT timing evaluation were statistically analyzed for the changes of lower limb motor function of the subjects, as shown in Figure 2.

The curve in Figure 2 shows that after 8 weeks of experimental training, the lower limb motor ability of the patients in the experimental group and the control group has been further improved. But on the whole, during the whole experiment, the exercise ability of the patients in the experimental group improved more rapidly, and the gap between the two groups continued to expand. The TUGT score of the experimental group was 38.45s before the experiment, dropped to 36.806s in the second week, 32.899s in the fourth week, 30.93s in the sixth week and 28.616s in the eighth week. It can be seen that the TUGT score of the patients in the experimental group improved faster in the next four weeks. Compared with the control group, the growth rate was relatively stable and the range was also smaller. The score of the control group was 38.56s before the experiment, dropped to 37.387s in the second week, 36.258s in the fourth week, 35.178s in the sixth week and 34.096s in the eighth week. Figure 2 further proves that exercise rehabilitation training has a good effect on improving the lower limb motor ability of stroke patients with hemiplegia, which can effectively improve the speed and flexibility of limb movement.

The FAC grading test results of the lower limb motor function changes of the patients were statistically analyzed, and the results are shown in Figure 3.

The curve change in Figure 3 can clearly reflect the significant effect of improving the walking ability of the patients in the experimental group after the exercise rehabilitation intervention during the experimental training. The improvement effect of the control group is relatively small, and the gap between the control group and the experimental group is also widening, especially in the 8th week after the end of the experiment. Before the beginning of the experiment, there was no significant

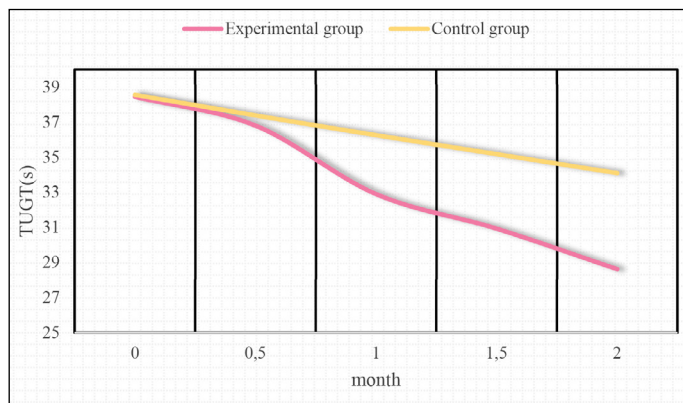


Figure 2. Changes of lower limb motor function during treatment -- TUGT as the judgment standard.

difference in the mean value of FAC grading test between the two groups. The difference between the experimental group and the control group was 1.86 and 1.87 respectively. The difference gradually widened in the second week. The difference between the experimental group and the control group was 2.2007 and 1.89845 respectively, 2.508 and 1.935 respectively in the fourth week, 2.7301 and 1.97176 respectively in the sixth week, and 2.9805 and 2.0013 respectively in the eighth week. At this time, the difference in FAC grading test scores between the two groups was the largest. The data curve in Figure 3 shows that after the intervention of exercise rehabilitation training, the improvement of walking ability of the patients in the experimental group is significantly better than that in the control group. It has been proved that the effect of exercise rehabilitation training on the improvement of lower limb motor ability is better than that of general rehabilitation training for hemiplegic patients with stroke.

Finally, the changes of the two indexes of the maximum weight bearing percentage of the hemiplegic side and the fastest turning speed of 5m in the experimental group and the control group were compared and analyzed. The results are shown in Table 2.

Through the comparative analysis of the data in Table 2, it can be seen that after 8 weeks of experiment, the two indicators of the experimental group and the control group have made significant progress. The percentage of maximum weight bearing on the hemiplegic side in the experimental group changed from $27.547 \pm 10.1407\%$ to $79.512 \pm 7.5242\%$; The fastest turn-back speed of 5m changed from $0.229 \pm 0.0304\text{m/s}$ to $0.545 \pm 0.0793\text{m/s}$. The maximum weight bearing percentage of the hemiplegic side in the control group changed from $31.175 \pm 9.8447\%$ to $72.336 \pm 11.2080\%$; The fastest turn-back speed of 5m changed from $0.233 \pm 0.0598\text{m/s}$ to $0.436 \pm 0.1110\text{m/s}$. In general, the experimental group and the control group have improved to some extent in the index of the maximum weight bearing percentage of the hemiplegic side and the fastest turn back speed of 5m, but compared with the experimental group, the improvement is greater. There was no significant difference between the two groups in the relevant indicators before treatment, but after treatment, the two indicators in the experimental group were gradually higher than those in the control group, for example, $79.512 \pm 7.5242\%$ and $70.336 \pm 11.2080\%$ of the maximum weight bearing index on the hemiplegic side; The maximum turn-back

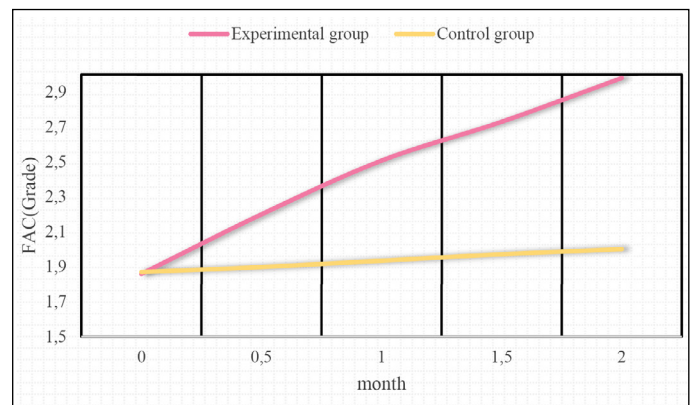


Figure 3. Changes of lower limb motor function during treatment -- based on FAC.

Table 2. Effect of motor rehabilitation nursing on the recovery of lower limb motor function in patients with hemiplegia after stroke.

Option	Group	Before treatment	After treatment
Maximum weight bearing percentage of hemiplegic side (%)	Experimental group	27.547±10.1407	79.512±7.5242
	Control group	29.175±9.8447	70.336±11.2080
Fastest turn-back speed of 5m (m/s)	Experimental group	0.229±0.0304	0.545±0.0793
	Control group	0.233±0.0598	0.436±0.1110

speed of 5m is $0.545 \pm 0.0793\text{m/s}$ and $0.436 \pm 0.1110\text{m/s}$ respectively. Therefore, it can be explained that the effect of motor rehabilitation nursing on the recovery of lower limb motor function of the patients with stroke hemiplegia is more significant than that of general rehabilitation treatment. The patients in the experimental group who received exercise rehabilitation nursing can reach a higher level of exercise in a faster time.

DISCUSSION

The most common form of rehabilitation for hemiplegia patients after stroke is routine physical therapy. The exercise rehabilitation nursing combined with routine rehabilitation program adopted in this paper is a more effective form of rehabilitation after treatment combining routine physical therapy and exercise training. By comparing and analyzing the data collected in the eight-week study, we can clearly see that all indicators of the experimental group with exercise rehabilitation nursing intervention have significantly improved compared with the conventional rehabilitation group. Therefore, based on the data and results of this paper, we can conclude that the rehabilitation of hemiplegia patients after stroke can be accelerated on the basis of routine rehabilitation. At the same time, it also has a positive effect on the lower limb motor dysfunction of patients, which accelerates the rehabilitation process of patients to a certain extent and shortens the rehabilitation cycle. It can promote the recovery of lower limb function of stroke hemiplegic patients, improve the quality of life, help reduce the burden of patients' families and communities, and is worth promoting.

CONCLUSION

Lower limb movement disorder is very common in patients with hemiplegia after stroke, which is an important factor affecting their ability to carry out activities of daily life. Therefore, it is very important to effectively and rapidly recover the lower limb motor function during the whole rehabilitation period. This paper studied the effect of motor rehabilitation nursing training on the recovery of lower limb motor dysfunction of stroke hemiplegic patients, and adopted a combination of motor rehabilitation and routine rehabilitation training to try to find an effective rehabilitation method for stroke hemiplegic patients. The experimental results showed that after 8 weeks of rehabilitation treatment, the lower limb motor function scores of patients in the exercise rehabilitation group and the routine rehabilitation group were significantly improved compared with the scores before the intervention. This shows that both exercise rehabilitation and routine rehabilitation have positive effects on improving the lower limb motor dysfunction of stroke hemiplegic patients, and the effect of exercise rehabilitation is stronger than that of routine rehabilitation group. Therefore, on the basis of routine rehabilitation treatment, supplemented with exercise rehabilitation may have a better effect on improving the lower limb movement disorder and improving the quality of life of hemiplegic patients after stroke.

All authors declare no potential conflict of interest related to this article

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