Comprehensive Rehabilitation Training Decreases Cognitive Impairment, Anxiety, and Depression in Poststroke Patients: A Randomized, Controlled Study

Chunmei Cheng, MM,* Xin Liu, MM,† Wenjun Fan, BA,* Xue Bai, BA,* and Zhaojun Liu, MM*

Background: To explore the effect of comprehensive rehabilitation training (CRT) on cognitive impairment, anxiety, and depression in poststroke patients. *Methods:* 168 poststroke patients were consecutively recruited in this randomized controlled study. Patients were randomly assigned to CRT group (CRT plus conventional treatment) and control group (conventional treatment) as 1:1 ratio. The specific interventions of CRT included patient and family member education, cognitive training, rehabilitation training, and regular check. *Results:* Both montreal cognitive assessment score change (Month12 [M12]-baseline; $P = .001$) and minimum mental state examination score change (M12-baseline) were higher in CRT group than that in control group ($P = .004$), and the percentage of cognitive impairment by montreal cognitive assessment score ≤26 was lower ($P = .003$) in CRT group compared to control group at month 12. Anxiety assessments were performed by hospital anxiety and depression scale (HADS) and Zung self-rating anxiety scale (SAS). The HADS anxiety score change (M12-baseline; $P = .002$) and the SAS score change (M12-baseline; $P = .006$) were decreased in CRT group compared to control group. Lower occurrence rate of anxiety assessed by SAS was observed in CRT group compared to control group ($P = .033$). Depression assessments were performed by HADS and Zung self-rating depression scale (SDS). HADS depression score change (M12-baseline; $P < .001$) and the SDS score change (M12-baseline; $P = .002$) were reduced in CRT group compared to control group. Decreased occurrence rate of depression assessed by SDS was found in CRT group compared to control group ($P = .022$). *Conclusions:* CRT contributes to the recovery of cognitive impairment, and decreases anxiety and depression in poststroke patients.

Key Words: CRT—cognitive impairment—anxiety—depression—poststroke patients

Introduction

Stroke, one of the most common and serious global health-care problem, is defined as an acute episode of focal dysfunction in brain, retina, or spinal cord owning to infarction or haemorrhage, whose symptoms persist longer than 24 hours.[1] 2017 heart disease and stroke statistics has proven that approximately 6.5 million stroke deaths occur worldwide in 2013, which make stroke no. 2 among all causes of deaths only behind ischemic heart disease.[2] In United States, every 40 seconds on average, someone occurs a stroke, and every 4 minutes on average, someone dies of a stroke.[2] Despite of impressive developments of early diagnosis and medical management which result in the decrease of incidence and mortality rates of stroke, about 25%-74% stroke patients still suffer life-long disability and severe psychological illness, including cognitive impairment, anxiety, and depression.[3,4] Due to motor and sensory impairments, which leads to life-long

From the *Department of Neurology, The 2nd Affiliated Hospital of Harbin Medical University, Harbin, China; and †Department of Rehabilitation, The 2nd Affiliated Hospital of Harbin Medical University, Harbin, China.

Received January 8, 2018; revision received May 18, 2018; accepted May 22, 2018.

Address correspondence to Zhaojun Liu, MM, Department of Neurology, The 2nd Affiliated Hospital of Harbin Medical University, 246 Xuefu Road, Harbin, China. E-mail: liuzhjun@outlook.com

1052-3057/$ - see front matter

https://doi.org/10.1016/j.jstrokecerebrovasdis.2018.05.038

disability and limitation of activities of daily living (ADL), many stroke patients are difficult to accept these sequelae and easy to lose confidence, or even have inferiority complex, thereby resulting in the increase of anxiety and depression. Hence, investigating stroke rehabilitation interventions are necessary to improve patients' mental health and increase their quality of life after stroke.

Stroke rehabilitation, described as a stroke-care intervention, is designed to decrease the disability and handicap due to a stroke.[5] Based on several previous studies, much of attention in stroke rehabilitation training is on the recovery of impaired movement and the associated functions.[6,7] However little is known about the role of comprehensive rehabilitation training (CRT) in the prognosis of poststroke patients, especially in psychological illness including cognitive impairment, depression, and anxiety. Thus, we designed a novel CRT, which was a complex rehabilitation programme including patient and family member education, cognitive training, rehabilitation training, as well as regular check, and the purpose of this study was to explore the efficacy of CRT on cognitive impairment, anxiety, and depression in poststroke patients.

Methods

Participants

A total of 168 patients who were initially diagnosed as ischemic stroke admitted in The 2nd Affiliated Hospital of Harbin Medical University from July 2014 to June 2016 were consecutively recruited in this randomized controlled study. All patients aged 18 years or older with a clinical diagnosis of ischemic stroke confirmed by brain computed tomography or magnetic resonance imaging, and had no history of stroke and no serious visual or hearing impairment, mental disorders that effect cognitive examination. Potential patients who met any of the following criteria were excluded from participating in the study: (1) Suffering from obvious cognitive impairment, mental decline, or dementia prior to the onset of ischemic stroke; (2) Unlikely to complete the cognitive, anxiety, and depression assessment within 7 days after stoke; (3) Life expectancy was less than 12 months; and (4) Combined with serious heart disease, liver or renal failure, malignant tumors, or other serious disease. The Ethics Committee of the 2nd Affiliated Hospital of Harbin Medical University had approved this study, and all patients provided signed informed consents.

Randomization

In this randomized controlled study, patients were randomly assigned to CRT group or control group as 1:1 ratio. Randomization sequence was created using blocked randomization method by Zung self-rating anxiety scale (SAS) software. The randomization was conducted by a statistical analyzer who was not involved in other parts of the study, and the documents were sent and kept in Shanghai Qeejen Bio-tech Company (a medical and statistic service company). When a patient was eligible for the study, a call was made to Qeejen Company and a unique subject identification number was provided from the randomized module.

Treatment

In CRT group, patients received CRT, usual care, and conventional treatment, and CRT was performed when patients with stable physical station and without rapid progress within 48 hours. In the control group, patients only received the conventional treatment and usual care. All patients of 2 groups received treatment for 6 months and follow-up for 12 months.

The specific interventions of CRT were as follows:

1. Patient and family member education: A manual of the Rehabilitation and Mental Health of Stroke, which included the understanding of stroke, influence by stroke, common issues, physical care, mental care, and so on, developed by our hospital was dispensed to the patients and their families for comprehensive education in the first 2 weeks after enrollment, and then detailed instruction was given once every 2 months for 6 months. Moreover, there was a special phone number in rehabilitation department of our hospital setting for patients or their caregivers to resolve the issues they met during the period, if needed, a nurse specialized in poststroke care, rehabilitation specialist, or a social worker was sent to visit the patient or the family member to further deal with the problems.
2. Cognitive training: Related research therapist (a trained, licensed occupational therapist with expertise in stroke rehabilitation) would visit the patient to provide instructions on cognitive training including simple instruction training, oral and facial muscle mimic training and rehearsal training for the patients with obstacles such as listening, speaking, reading, writing, and retelling in 2 weeks after enrollment, and then once a month for 6 months.
3. Rehabilitation training: (1) Related research therapist would visit the patient to provide instructions to the relatives of the patient on massage and systemic coordinative training 2 weeks after enrollment, and then once every 2 months for 6 months. (2) Patients were instructed to visit the rehabilitation department of our hospital to