International Journal of
Neurology and Neurotherapy

Huang et al. Int J Neurol Neurother 2016, 3:063
DOI: 10.23937/2378-3001/3/6/1063
Volume 3 | Issue 6

ISSN: 2378-3001

Original Research: Open Access

Effectiveness of A Fall Prevention Protocol for Patients with Ischemic Stroke During Hospitalization

Yanxia Huang[1#], Ting Luo[2#], Lihui Huang[3#], Lei Zhang[1‡], and Hongmei Tao[4*]

[1]*Department of Neurology, The Fifth Affiliated Hospital of Sun Yat-sen University, China*

[2]*Department of Neurosurgery, The Fifth Affiliated Hospital of Sun Yat-sen University, China*

[3]*Department of Cadre Healthcare, The Fifth Affiliated Hospital of Sun Yat-sen University, China*

[4]*Department of Nurse, The Fifth Affiliated Hospital of Sun Yat-sen University, China*

[#]*Contributed equally to the manuscript*

***Corresponding author:** *Hongmei Tao, Master, Department of Nurse, The Fifth Affiliated Hospital of Sun Yat-sen University, No 52 Meihuadong Road, Zhuhai, Guangdong, China, Tel: +86-7562528725, Fax: +86-7562528726, E-mail: 13726209240@139.com*

‡Co-corresponding author: *Lei Zhang, Department of Neurology, The Fifth Affiliated Hospital of Sun Yat-sen University, No 52 Meihuadong Road, Zhuhai, Guangdong, China, Tel: +86-7562528725, Fax: +86-7562528726, E-mail: doctorzl@126.com*

Abstract

Background and purpose: Patients with ischemic stroke are at high risk of fall. However, few study focused on fall prevention for patients with ischemic stroke in hospital. The aims of the study were to find out the causes of falling in the inpatient ischemic stroke patients and formulate a fall prevention protocol for them.

Methods: The falling patients admitted in the Department of Neurology of Sun Yat-sen University from July 2014 to June 2015 were retrospectively analyzed to find out the causes of fall. And then a fall prevention protocol for patients with ischemic stroke was formulated. The protocol was applied to the admitted patients with ischemic stroke from July 2015 to June 2016.

Results: The incidence of fall in patients with ischemic stroke during hospitalization from July 2014 to June 2015 was significantly lower than that from July 2015 to June 2016.

Conclusions: Recognizing fall risk upon the ischemic stroke patient's admission plays an important part in the efforts for preventing falls during hospitalization. The comprehensive fall prevention protocol including general measures for all patients and additional measures for ischemic stroke patients was effective in reducing the incidence of falls.

Keywords

Ischemic stroke, Fall

Introduction

Stroke is one of the major causes of adult disability, leading to dependence in activities of daily living [1]. Stroke patients have multiple "intrinsic" risk factors [2] for falling including slow and abnormal gait, poor balance, visuospatial deficits, cognitive impairment and impulsivity. All of these make them inherently vulnerable to fall, over and above other risks associated with older people in hospital. Furthermore, medications, such as sedatives and antidepressants, are commonly used following stroke, and may increase the risk of falling [3]. Patients with stroke are much more likely to sustain a hip fracture due to a fall than people without stroke and more often lose independent mobility or even die after a hip fracture [4,5]. This finding makes falls and their prevention an important issue for every person involved in stroke care and in any of the post stroke stages.

However, the evidence for successful fall prevention programmes in falls in hospital is limited, with modest results from a small number of randomized controlled trials [6-10]. The aims of our study were to find out the causes of falling in the inpatient ischemic stroke patients and formulate a fall prevention protocol for them.

Methods

Patients

The study included all the patients who were diagnosed as having ischemic stroke for the first time and admitted in the Department of Neurology of The Fifth Affiliated Hospital of Sun Yat-Sen University from July 2014 to June 2016.

Diagnosis of ischemic stroke

The diagnosis of ischemic stroke was based on the history of symptoms and their acute presentation, clinical examination and cerebral diffusion-weighted magnetic resonance imaging (DWI).

Data collection and assessment

The data on demographic characteristics, National Institutes of Health Stroke Scale (NIHSS), and details of the falls were collected from medical documentation. The data of the patients with ischemic

ClinMed International Library

Citation: Huang Y, Zhang L, Luo T, Huang L, Tao H (2016) Effectiveness of A Fall Prevention Protocol for Patients with Ischemic Stroke During Hospitalization. Int J Neurol Neurother 3:063. doi.org/10.23937/2378-3001/3/6/1063

Received: September 01, 2016: **Accepted:** December 13, 2016: **Published:** December 15, 2016

Table 1: Cases of fall among ischemic stroke patients from July 2014 to June 2015.

	Age	Gender	NIHSS	Infarction distribution	Infarct location	Time of fall	Injury	Place
Case 1	75	Male	5	Anterior circulation	Corona radiata	Day 5, 2:30 a.m.	Skin abrasion	Toilet
Case 2	71	Male	4	Anterior circulation	Basal ganglion	Day 12, 11:50 a.m.	None	Toilet
Case 3	71	Male	6	Anterior circulation	Subcortical	Day 8, 5:00 a.m.	Skin abrasion	Toilet
Case 4	66	Female	4	Posterior circulation	Pontine	Day 17, 7:00 p.m.	Fracture of femur neck	Corridor

Table 2: Case of fall among ischemic stroke patients from July 2015 to June 2016.

	Age	Gender	NIHSS	Infarction distribution	Infarct location	Time of fall	Injury	Place
Case 1	82	Female	6	Anterior circulation	Corona radiata	Day 2, 2:30 a.m.	Swelling of the face	Ward

Table 3: Comparison of ischemic stroke patients in phase 1 and phase 2.

	Phase 1	Phase 2	P
Age (years)	65.6 ± 11.7	66.8 ± 10.4	0.907
Male (%)	57.3 (235/410)	60.4 (415/687)	0.673
NIHSS	6.2 ± 4.3	5.9 ± 4.1	0.764
Infarction distribution (%)			
Anterior circulation	84.4 (346/410)	82.4 (566/687)	0.913
Posterior circulation	14.9 (61/410)	17.0 (117/687)	0.704
Anterior and posterior circulation	0.7 (3/410)	0.6 (4/687)	0.875
Incidence of fall (%)	0.98 (4/410)	0.14 (1/687)	0.048

stroke admitted from July 2014 to June 2015 (phase 1) were retrospectively collected. The causes of falls among these patients were analyzed. A fall prevention protocol for stroke patients was introduced from July 2015 to June 2016 (phase 2). The effect of the protocol on reducing falls was assessed.

General fall prevention protocol

The general fall prevention protocol for all admitted patients included: demonstration of emergency call device near the bed and in the bathroom; demonstration of bed adjustment mechanism; improved lightning; removal of mobile objects near the bed; agreement on the voiding plan; alerting to slippery floor and the importance of non-slippery footwear; and instruction on properly using supports and holders.

The fall prevention protocol for stroke patients

From July 2015, the following measures were implemented for the patients with ischemic stroke: 1) setting up a discrete high-risk mark that constantly reminded the staff of the patient's risk; 2) reminding the patient's family members or caregivers of carrying our fall prevention protocol; 3) informing the patient how psychotropic medication influence state of consciousness; 4) accompanying the patient to and from therapy/examination premises; 5) verifying adequate size of patient's clothing; 6) three 30 seconds (30 seconds from waking up to getting up, 30 seconds from getting up to standing up, 30 seconds from standing up to walking); 7) collecting information on the patient's balance and/or coordination disorder; 8) getting information on the patient's cognitive abilities and memory; 9) assessing the muscle strength everyday and setting up individualized activity plan: grade 0-2, passive activity on the bed; grade 3, active and passive activity on the bed; grade 4, early provision of medical aids to facilitate ambulation under the guide of nurse, with the caregiver accompanying on the paralysis side of the patient; grade 5, normal activity; 10) management of urination and defecation according to muscle strength: grade 0-2, using bedpan on the bed; grade 3-4, using chair for urination and defecation on bedside; grade 5, using toilet; 11) management of bath according to muscle strength: grade 0-3, ablution on the bed by caregiver; grade 4-5, taking bath in washroom accompanied by caregiver; 12) choosing proper caregiver according to the severity of stroke and bodyweight of the patient; 13) removal of mobile objects near the bed; 14) hourly inspections by nursing staff; 15) placing the patient in a room close to the nursing staff room; 16) alerting the patient's visitors to the fall prevention measures; 17) informing the nurses on the next shift about the fall risk of all the stroke patients; 18) supervision of the fall prevention measures by nursing group leaders and head nurse.

Statistical analysis

Statistical analysis was performed by SPSS version 19.0. P-values of 0.05 were considered statistically significant. All quantitative data in this study are presented as mean ± standard deviation (SD) or median ± range. Quantitative data were processed using the t test. Qualitative data were analyzed with the chi-square test.

Results

In phase 1, there were 410 patients with ischemic stroke admitted to our department. Among them, there were 4 cases of fall. The details of the 4 cases were summarized in table 1.

In phase 2, there were 687 patients with ischemic stroke admitted to our department. Among them, there was 1 case of fall. The details of the case were summarized in table 2.

The demographic characteristics and NIHSS scores were not significantly different between the patients in these 2 phases (Table 3). The patterns of infarction distribution were not significantly different between the patients in these 2 phases (Table 3). The incidence of fall in phase 2 was significantly lower than that in phase 1 (Table 3).

Discussion

Ischemic stroke is a main cause of neurologic morbidity and mortality worldwide. Patients with ischemic stroke are at high risk of fall due to various neurologic inpairment and some medications [2,3]. The consequences of a fall for the patient can be severe, including traumatic injuries and reduced functional ability, fear from falling again and therefore reduced activity [11]. These consequences can negatively affect the rehabilitation process and the rehabilitation outcomes, hospitalisation can be prolonged and the costs of care can soar [12]. Thus, fall prevention is very important for patients with ischemic stroke. However, few study focused on fall prevention for patients with ischemic stroke in hospital. The aims of our study were to find out the causes of falling in the inpatient ischemic stroke patients and formulate a fall prevention protocol for them.

From the cases of fall in phase 1, we found some factors that might cause the fall. First of all, the patients were with hemiparesis, especially when their muscle strength got improved after therapy, they were apt to overestimate their independency and not willing to ask for help. Secondly, all the falls took place in the noon shift or night shift when there were only 2 nurses. Finally, most of the falls occurred when patients urinated or defecated. Accordingly, we formulated the fall prevention protocol for stroke patients on the base of general fall prevention protocol. In the fall prevention protocol for stroke patients, individualized activity plan, management of urination, defecation, and bath were set up according to muscle strength. It could be easily carried out by the nurses, caregivers, and the patients. And it was much more clear than just reminding the patients and caregivers to be cautious. Meanwhile, we emphasized dynamic assessment so that the plan could be adjusted in time when the patient's muscle strength improved or deteriorated. Besides, other factors related to fall risk were integrated, such as impaired balance, medications, cognitive abilities, and memory. Furthermore, the frequency of inspections by nursing staff was increased. Since the fall prevention protocol for stroke patients was introduced, the incidence of fall in patients with ischemic stroke was significantly decreased.

The limitation of our study was that the amount of the cases of fall was small, so we were not able to perform association analysis to find out the risk factors of fall among stroke patients during hospitalization.

In conclusion, recognizing fall risk upon the ischemic stroke patient's admission plays an important part in the efforts for preventing falls during hospitalization. The comprehensive fall prevention protocol including general measures for all patients and additional measures for ischemic stroke patients was effective in reducing the incidence of falls.

Conflict of Interest

The authors declare that there are no conflicts of interest.

Sources of Funding

This study is funded by Prognosis Registration Research of Treatment for Acute Ischemic Stroke in China (KLK-CBV-2015-001-C).

Financial Support

This study is funded by Prognosis Registration Research of Treatment for Acute Ischemic Stroke in China (KLK-CBV-2015-001-C), and Science and Technology Program of Zhuhai (20161027E030032).

Ethics Statement

This research was approved by the ethics committee of The Fifth Affiliated Hospital of Sun Yat-sen University.

References

1. Grimby G, Andrén E, Daving Y, Wright B (1998) Dependence and perceived difficulty in daily activities in community-living stroke survivors 2 years after stroke: a study of instrumental structures. Stroke 29: 1843-1849.
2. Oliver D, Daly F, Martin FC, McMurdo ME (2004) Risk factors and risk assessment tools for falls in hospital in-patients: a systematic review. Age Ageing 33: 122-130.
3. Nyberg L, Gustafson Y (1997) Fall prediction index for patients in stroke rehabilitation. Stroke 28: 716-721.
4. Ramnemark A, Nilsson M, Borssén B, Gustafson Y (2000) Stroke, a major and increasing risk factor for femoral neck fracture. Stroke 3: 1572-1577.
5. Ramnemark A, Nyberg L, Borssén B, Olsson T, Gustafson Y (1998) Fractures after stroke. Osteoporos Int 8: 92-95.
6. Cameron ID, Gillespie LD, Robertson MC, Murray GR, Hill KD, et al. (2012) Interventions for preventing falls in older people in care facilities and hospitals. Cochrane Database Syst Rev 12: CD005465.
7. Haines TP, Bennell KL, Osborne RH, Hill KD (2004) Effectiveness of targeted falls prevention programme in subacute hospital setting: randomised controlled trial. BMJ 328: 676.
8. Healey F, Monro A, Cockram A, Adams V, Heseltine D (2004) Using targeted risk factor reduction to prevent falls in older in-patients: a randomised controlled trial. Age Ageing 33: 390-395.
9. Stenvall M, Olofsson B, Lundström M, Englund U, Borssén B, et al. (2007) A multidisciplinary, multifactorial intervention program reduces postoperative falls and injuries after femoral neck fracture. Osteoporos Int 18: 167-175.
10. Cumming RG, Sherrington C, Lord SR, Simpson JM, Vogler C, et al. (2008) Cluster randomised trial of a targeted multifactorial intervention to prevent falls among older people in hospital. BMJ 336: 758-760.
11. Mayo NE, Korner-Bitensky N, Levy AR (1993) Risk factors for fractures due to falls. Arch Phys Med Rehabil 74: 917-921.
12. Aberg AC, Lundin-Olsson L, Rosendahl E (2009) Implementation of evidence-based prevention of falls in rehabilitation units: a staff's interactive approach. J Rehabil Med 41: 1034-1040.