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

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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...
were analyzed. A fall prevention protocol for stroke patients was retrospectively collected. The causes of falls among these patients stroke admitted from July 2014 to June 2015 (phase 1) were nursing group leaders and head nurse.

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.

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 out 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.

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

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>NIHSS</th>
<th>Infarction distribution</th>
<th>Time of fall</th>
<th>Injury</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>75</td>
<td>Male</td>
<td>5</td>
<td>Day 5, 2:30 a.m.</td>
<td>Skin abrasion</td>
<td>Toilet</td>
</tr>
<tr>
<td>Case 2</td>
<td>71</td>
<td>Male</td>
<td>4</td>
<td>Day 12, 11:50 a.m.</td>
<td>None</td>
<td>Toilet</td>
</tr>
<tr>
<td>Case 3</td>
<td>71</td>
<td>Male</td>
<td>6</td>
<td>Day 8, 5:00 a.m.</td>
<td>Skin abrasion</td>
<td>Toilet</td>
</tr>
<tr>
<td>Case 4</td>
<td>66</td>
<td>Female</td>
<td>4</td>
<td>Day 17, 7:00 p.m.</td>
<td>Fracture of femur neck</td>
<td>Corridor</td>
</tr>
</tbody>
</table>

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 impairments 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, hospitalization can be prolonged and the costs of care can soar [12]. Thus, fall prevention is very important for patients with ischemic stroke. However, few studies 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.

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Ethics Statement

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

References


