Assessment of Fall Risk and Frequency Among Patients in the Nursing and Supportive Treatment Hospital

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Key Words: *falls; fall risk; patients; nursing and supportive treatment hospital.*

Summary. *The aim of this study was to evaluate the patients' fall risk and frequency in the Nursing and Supportive Treatment Hospital during the whole period of treatment.*

Material and Methods. The study was performed in the Nursing and Supportive Treatment Hospital. The patients' inclusion criteria were written consent to participate in the study and the Mini-Mental State Examination score of >10. The patients stayed for 4 months in the Nursing and Supportive Treatment Hospital. In total, 272 patients started the survey, 53 patients died during the study period, and 219 patients were followed up and assessed during the whole hospital stay. If a patient had a fall, a special form designed by the authors was filled out.

Results. The majority (69.3%) of the patients were admitted to the Nursing and Supportive Treatment Hospital after their treatment in an acute care hospital. All the patients admitted to the Nursing and Supportive Treatment hospital had a fall risk: 12.3% of the patients had a moderate fall risk and 87.7% had a high fall risk. The patients' fall risk after admission and before discharge after a 4-month period in the Nursing and Supportive Treatment Hospital was similar. Almost half (49.6%) of the patients had a fall at least once during the 4-month period of stay in hospital. The frequency of falls correlated with older age, longer hospital stay, the Barthel index, and a higher risk of fall (Morse Fall Scale); the correlations were weak although statistically significant. According to the patient opinion and the data of observation, the most frequent circumstances after a fall were wet floors (54.8%), improper footwear (52.6%), and no light during dark time periods (43.7%).

Conclusions. Falls in the Nursing and Supportive Treatment Hospital remain a serious problem for the patients. Almost half of the patients had a fall at least once during a 4-month period of hospital stay. Special attention should be paid to the safe hospital environment: avoiding wet floors, assuring proper light during day and night time, and encouraging proper footwear.

Introduction

Falls and fall-related injuries are a common and serious problem for older people and have consistently been associated with the quality of nursing care in the entire health care setting. In long-term care facilities, 29% to 55% of residents are reported to fall during their stay (1). Injury rates are reported to be up to 20%, twice that of community-dwelling elderly. An increase in injury rates is likely because long-term care residents are more vulnerable than those who can function in the community (2). The prevalence of risk factors is higher in nursing homes, and most residents have more than one risk factor (3). In the long-term care setting, well-established risk factors are muscular weakness, balance and gait deficits, poor vision, delirium, cognitive and functional impairment, orthostatic hypotension, urinary incontinence, medications (number of drugs, antidepressants, psychotropic, nonsteroidal anti-inflammatory drugs, and vasodilators) and co-morbidities (depression, stroke, Parkinson's disease, and arthritis) (3, 4).

While the majority of falls in long-term care settings should be preventable, it is not feasible to prevent all falls, even when the best possible fall prevention system is provided. Preventing falls constitutes a significant challenge in nursing home settings and requires an interdisciplinary team effort. An approach to minimize the risk of falling involves both a patient-centered approach (e.g., fall risk screening, assessment, and development of an action plan) and a health care institution organizational level approach. Single interventions such as exercise alone or insufficient organizational support are reasons for failure or even harmful consequences (5).

Therefore, reducing the risk of falls and fall-related injuries in long-term care facilities requires a comprehensive approach that focuses on identifying the myriad conditions that predispose to falls and addressing each resident's identified risk factors

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(6); this needs to start on each resident's first day of admission. In addition, when a fall occurs, systemic improvement depends on conducting a thorough root cause analysis of the fall, which includes tracking trends (e.g., when, where, and how the fall occurred), the number of falls per unit, and whether any staff members were present.

Every facility should have a fall prevention program that addresses the assessment of residents for the risk of falling as well as identification and implementation of interventions to minimize the risk of falling and the risk of sustaining an injury as a result of a fall.

The aim of this study was to evaluate the patients' fall risk and frequency in the Nursing and Supportive Treatment Hospital during the entire treatment period.

Material and Methods

Study Design and Sample. The study was performed in the Nursing and Supportive Treatment Hospital of Kaunas region. The data were collected between September 2011 and March 2012. The patients' inclusion criteria were written consent to participate in the study and the Mini-Mental State Examination score of >10. In total, 272 patients started the survey, 53 patients died during the study period, and 219 patients were followed up in stage 3.

Study Organization. The patients in the Nursing and Supportive Treatment Hospital were hospitalized for 4 months. Stage 1 lasted for 1–2 days after patient admission, stage 3 lasted for 2–3 days before discharge, and stage 2 was the longest, i.e., the patients were followed up and assessed during the entire hospitalization period (Fig.). Hospital administration and staff were informed about the purpose of the research and granted the permission to conduct the study. The data were collected by the principal researcher and registered nurses after special instruction given.

Instruments. Several standardized instruments were used for this study.

Barthel Index. The patient's functional status was assessed. Scores range from 0 (totally dependent) to 100 (independent).

Morse Fall Scale. The fall risk of the patients was assessed. Scores range from 0 to 125 and may indicate no fall risk (0–24 scores), moderate risk (25–50 scores), and high risk (⩾51 scores).

Mini-Mental State Examination. This is an 11-item screening test of the cognitive function. Scores range from 0 (severe impaired) to 30 (intact) (7).

Patient Fall Assessment. A fall was defined as an unintentional event that results in the person coming to rest on the ground or another lower level not as the result of major intrinsic event (such stroke or epilepsy) or overwhelming hazards (such as being pushed) (8). If a patient had a fall, a special form designed by the authors was filled out.

Ethical consideration. The study protocol was approved by the Centre of Bioethics at the Lithuanian University of Health Sciences (BC-KC(M) - 04(2011).

Statistical analysis was carried out with SPPS version 17.0 (9). The data were analyzed using the χ^2 test. Comparisons were made between age groups. The Pearson correlation was employed to estimate the relationship between different variables. The difference was considered statistically significant when $P \leqslant 0.05$.

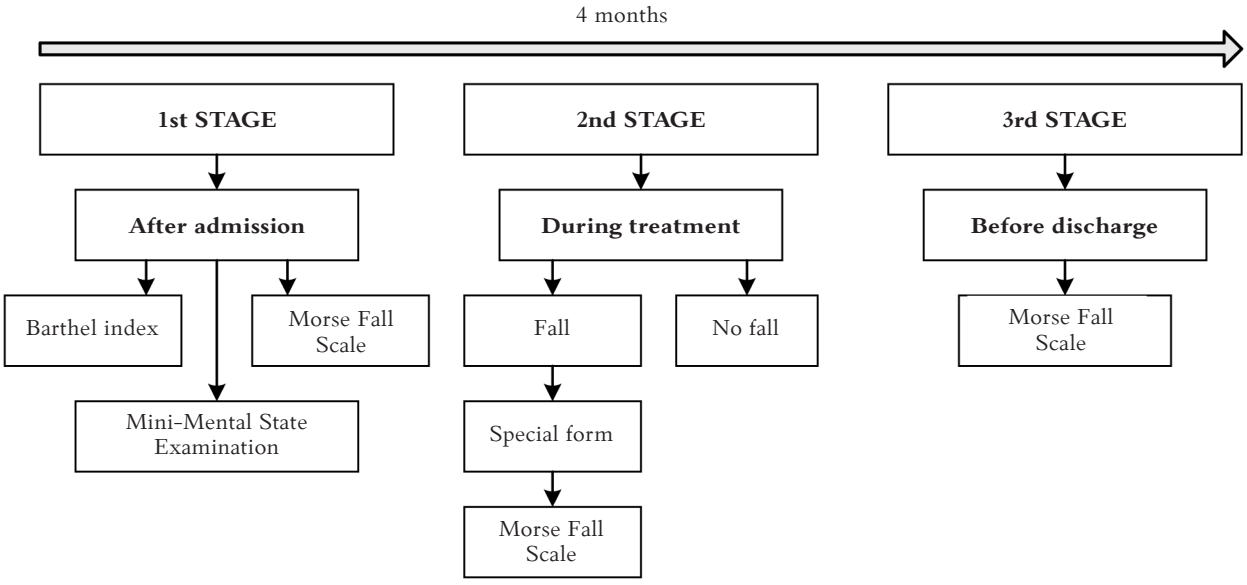

Fig. The study organization in a 4-month hospitalization period

Results

The mean age of the patients was 76.7±11.0, where the youngest was aged 28 years and the oldest 99 years. The largest group of the patients (59.9%) was aged 76 years and older. There were 59.3% of women and 40.7% of men.

The majority of the patients (69.3%) arrived to the Nursing and Supportive Treatment Hospital from an acute care hospital, 19.7% from home, and 11.0% from other care institutions.

During the first week after admission, the patients' fall risk was assessed using the Morse Fall Scale. All the patients had a risk fall: 87.7% had a high risk fall and 12.3% a moderate risk fall. The patients' fall risk after admission and before discharge after a 4-month period in the Nursing and Supportive Treatment Hospital was similar. Before discharge, only several patients (0.5%) had no fall risk, 11.9% had a moderate risk, and 87.7% had a high fall risk (by the Morse Fall Scale). Almost half (49.6%) of the patients had a fall at least once during a 4-month period in the Nursing and Supportive Treatment Hospital.

Table 1 shows correlations between falls and patient age, duration of stay, amount of medications, Morse Falls Scale, Barthel index, and MMSE values. The frequency of falls correlated with older age, longer hospital stay, the Barthel index, and a higher fall risk (by the Morse Fall Scale); the correlations were weak although statistically significant ($P<0.05$).

Half (51.0%) of the women had a fall at least once during 4 months of hospital stay at the Nursing and Supportive Treatment Hospital (Table 2). The patients usually had the first and the second fall in a ward or in WC.

According to patients' opinion, more frequently they had a fall leaving bed (41.5%) and slipped by walking 38.5%. According to patients' opinion, the most frequent circumstances after a fall were wet floors (54.8%), improper footwear (52.6%), and no light during the dark time period (43.7%).

Besides, 43.0% of the patients experienced no consequences after a fall although more than half (55.6%) of them reported a fear of fall, 49.5% experienced minor physical injuries, and 1.5% had a serious consequence, i.e., a hip fracture.

Table 1. Correlation Between Falls and Patient Age, Duration of Stay, Amount of Medications, Morse Falls Scale, Barthel Index, and MMSE values

Domain	Falls	Age	Days of Stay	Medications	MFS	Barthel Index	MMSE
Falls	1	–	–	–	–	–	–
Age	0.134*	1	–	–	–	–	–
Days of stay	0.410**	–0.032	1	–	–	–	–
Medications	0.069	0.076	0.082	1	–	–	–
MFS	0.421**	0.114	0.210**	0.035	1	–	–
Barthel index	0.409**	–0.194*	0.287**	0.089	0.432**	1	–
MMSE	0.215**	–0.073	0.090	0.084	0.050	0.373**	1

*$P<0.05$, **$P<0.01$.
MMSE, Mini-Mental State Examination; MFS, Morse Fall Scale.

Table 2. Comparison by Number of Falls During Hospital Stay Assessed in Relation to Patients' Gender and Place of Fall

Domain	No Fall n (%) (n=137)	Falls, n (%), (n=135)			
		One (n=58)	Two (n=54)	Three (n=16)	Four (n=7)
Gender					
Male (n=115)	60 (52.2)	25 (21.7)	20 (17.5)	5 (4.3)	5 (4.3)
Female (n=157)	77 (49.0)	33 (21.0)	34 (21.7)	11 (7.0)	2 (1.3)
	$\chi^2=3.988$, $df=4$, $P=0.408$				
Place of fall					
Ward	–	21 (36.2)	22 (40.8)	5 (31.3)	1 (14.2)
WC	–	31 (53.5)	28 (51.9)	5 (31.3)	3 (42.9)
Corridor	–	1 (1.7)	1 (1.8)	6 (37.4)	3 (42.9)
Outdoors	–	5 (8.6)	3 (5.5)	0	0
Total	137 (50.4)	58 (21.3)	54 (19.8)	16 (5.9)	7 (2.6)

Discussion

Almost half of the residents had a fall during stay in the Nursing and Supportive Treatment Hospital. Mostly, they experienced repeated falls. As the study results showed, the main reasons of falls were avoidable, such as wet floors, improper footwear, and no light during dark time periods.

In a German study (10), the following factors were associated with the fall risk: limited mobility, cognitive impairment, recent history of falls for nursing home residents, and, additionally, urinary incontinence and older age of hospital patients. In our study, a higher fall risk was associated with a longer duration of stay in hospital. Another study (11) reported that about 75% of all falls occurred in the nursing home residents' rooms or in the bathrooms and only 22% were reported to occur within the common areas. This study also revealed the most common area of falls, i.e., a ward or WC.

Becker et al. (12) have recently described an algorithm to assess a fall risk in the long-term care setting, categorizing long-term care residents into 3 subgroups: residents requiring assistance to transfer, residents able to transfer with a history of falls and requiring the use of restraints, and residents able to transfer and with no history of falls but with urinary incontinence and visual impairment. The researchers found that the residents with the history of falls were at the highest risk of falls, which is consistent with other research in this domain but might be useful to tailor interventions and would warrant prospective evaluation.

Traditional hospital-based incident reports deem all inpatient falls to be avoidable, and therefore, falls are classified as adverse events. Indeed, falls are the most frequently reported adverse events in the adult setting. But underreporting of fall events is possible and this is a Lithuanian case; so, injury reporting is likely a more consistent quality measure over time and organizations should consider judging the effects of interventions based on injury rates, not only fall rates. In Lithuania, fall inclusion in the adverse reports list has been recently considered, and some hospitals are just establishing fall-reporting forms. On the other hand, fall reporting and the prevention system are used to ensure quality of care. In the nursing home setting, the long-term care minimum dataset is used for reporting all the aspects of care. The long-term care minimum dataset captures fall and injury histories via assessments that are performed on admission and at regular intervals during a resident's stay (13). In addition, residents are evaluated for balance and for the ability to perform activities of daily living, with the goal to apply fall prevention measures should the patient be deficient in these areas. Research carried out in 2005 by Hill-Westmoreland and Gruber-Baldini (14) indicated only a 75% concordance between chart abstraction and minimum dataset reporting for a group of long-term care facilities. Development in the long-term care setting, the Nursing Home Quality Initiative, promotes the collection of a list of enhanced quality indicators, including those that track declines in functional and cognitive status (13).

Fall prevention in the Nursing and Supportive Treatment Hospital continues to be a major focus for patient safety and improvement in the quality of care.

Conclusions

Falls in the Nursing and Supportive Treatment Hospital remain a serious problem for the patients. Almost half of the patients had a fall at least once during a 4-month period of hospital stay. Falls were related to older age, longer hospital stay, and a higher risk of falls.

Administration is obligated to establish a fall prevention system in order to improve patient quality of care. Special attention should be paid to safe hospital environment, such as avoidance of wet floors, assurance of proper light during day and night time, and proper footwear.

Statement of Conflict of Interest

The authors state no conflict of interest.

Pacientų griuvimo rizikos ir dažnumo vertinimas slaugos ir palaikomojo gydymo ligoninėje

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Raktažodžiai: griuvimas, griuvimo rizika, pacientai, slaugos ir palaikomojo gydymo ligoninė.

Santrauka. *Tyrimo tikslas* – įvertinti pacientų griuvimo riziką ir griuvimo dažnumą slaugos ir palaikomojo gydymo ligoninėje.

Medžiaga ir metodai. Tyrimas atliktas vienoje slaugos ir palaikomojo gydymo ligoninėje. Pacientų įtraukimo į tyrimą kriterijai: raštiškas sutikimas dalyvauti tyrime, Trumposios protinės būklės anketos rezultatai –

daugiau kaip 10 balų. Pacientai gydėsi slaugos ir palaikomojo gydymo ligoninėje 4 mėnesius. Tyrimas buvo pradėtas dalyvaujant 272 pacientams; 53 pacientai mirė tyrimo laikotarpiu. Tyrimo pabaigoje dalyvavo 219 pacientų. Pacientai buvo stebimi visą 4 mėn. gydymosi laikotarpį. Jei pacientai pargriuvo gydymosi ligoninėje laikotarpiu, buvo pildoma speciali autorių sukurta forma.

Rezultatai. Dauguma pacientų (69,3 proc.) į slaugos ir palaikomojo gydymo ligoninę atvyko iš ligoninių. Visiems pacientams, atvykusiems į slaugos ir palaikomojo gydymo ligoninę, buvo padidėjusi griuvimo rizika – 12,3 proc. vidutinės ir 87,7 proc. didelės rizikos. Pacientų griuvimo rizika po 4 mėn. gydymo slaugos ir palaikomojo gydymo ligoninėje buvo panaši kaip ir atvykstant. Beveik pusė (49,6 proc.) pacientų pargriuvo bent vieną kartą per 4 mėn. Griuvimas buvo susijęs su vyresniu amžiumi, ilgesne gydymosi trukme, Bartelio (Barthel) indeksu ir didesne griuvimo rizika (vertinant pagal Morse'o griuvimo skalę). Pacientų nuomone, dažniausios (54,8 proc.) griuvimo priežastys buvo šlapios grindys (52,6 proc.), netinkama avalynė ir prastas apšvietimas tamsiuoju paros metu (43,7 proc.).

Išvados. Pacientų griuvimo problema slaugos ir palaikomojo gydymo ligoninėje išlieka labai aktuali. Beveik pusė pacientų buvo bent kartą pagriuvę 4 mėn. gydymosi slaugos ir palaikomojo gydymo ligoninėje laikotarpiu. Slaugos ir palaikomojo gydymo ligoninėje turi būti skiriamas ypatingas dėmesys saugiai aplinkai: tinkamai išvalytos grindys, geras apšvietimas, rekomenduojama avalynė.

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