Causes and Course of Falls Resulting in Hip Fracture among Elderly Thai Patients

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Objective: *To investigate causes and course of fall-related hip fractures in elderly individuals admitted to a hospital.*
Material and Method: *The authors collected data from older patients admitted with fall-related hip fractures. The cause and the clinical course of falls were evaluated by consultants in geriatric medicine. All patients were followed-up until discharge from the hospital.*
Results: *Falls usually occurred indoors (78.6%) during the daytime (67.5%). Only 27.5% of the falls were attributable to purely extrinsic causes. Neurological, musculoskeletal, and visual problems along with orthostatic hypotension were the leading causes of falls in the present study. Women demonstrated more intrinsic causes (41.9% vs. 28.9%), such as musculoskeletal (33.9% vs. 11.1%), and visual impairment (21.0% vs. 11.1%), whereas falls involving men were more likely to be caused by orthostatic hypotension (21.8% vs. 8.1%). Most patients received surgical treatment (92.5%). The most common complications during the hospital stay were delirium (45%). The modified Rankin Scale of 2-5 at discharge was noted in 46.3% of patients, and mortality was 3.8%. The median length of hospital stay was 15 days (7-75 days). The direct costs of in-hospital care were 2,427.2 (761.9-8,348.6) US dollars for general wards, and 3,739.1 (1,333.6-11,871.7) US dollars for special wards.*
Conclusion: *Intrinsic causes (pure and combined with extrinsic) lead to falls with hip fractures more often than purely extrinsic causes. Women and men had different etiologies for falls. Hip fracture leads to a number of in-hospital complications and significant functional impairment. Preventive strategies following the present study would likely lead to more accurate and beneficial outcomes.*

Keywords: *Falls, Hip fracture, Cause, Course, Cost*

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Falls are common problem in the elderly. The universally reported prevalence is approximately 20% over a period of six months. In recent decades, several epidemiologic studies have investigated the risk factors for falls by comparing the factors between those who have had history of falls and those who have not[1-3]. Frequently reported risk factors include female, poor self-perceived health status, previous history of falls, psychotropic/antiepileptic drug usage, gait problems, using walking aids, cognitive impairment, vertigo, Parkinson's disease, and neuromuscular and visual impairment[1,2,4,5]. Risk factors for falls are generally categorized as extrinsic and intrinsic. Among these, data that attribute falls more frequent due to extrinsic factors are usually derived from epidemiologic studies[2,6,7]. However, the exact causes of falls have rarely been investigated in the elderly who fell recently.

Previous epidemiological research had demonstrated conflicting results regarding the place, time, and activity being performed while falling[2,8]. Many strategies have been proposed to screen those at higher risk of falls and to reduce the risk of recurrent falls. The Thai Falls Risk Assessment Test (Thai-FRAT) is one such strategy, and comprises of a leaflet containing information on risk factors associated with falls, being sent to the patients' home, in combination of a balancing exercise[9-11].

Falls frequently result in fractures and other serious consequences. One of the most serious among these is the hip fracture, commonly leads to reduced quality of life, permanent disability, institutionalization, or even death[12,13]. Advancing age, female, onset of

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menopause before 45 years of age, and visual impairment were reported to be more common among those who fell and sustained fractures, compared to those who fell but did not sustain fractures[14]. The hospital course of patients with hip fractures, apart from the mortality rate, has never been studied in Thailand. Additionally, the cost of medical care associated with fall-related hip fractures was investigated in the distant past and needs to be appraised for the current situation[13,15].

Therefore, the authors aimed to investigate the causes and events led to falls in older individuals admitted to a hospital with hip fractures. The authors selected only patients with hip fractures, because it is rated as a serious consequence of falls. Moreover, such patients are admitted to hospital, which provides the investigators an excellent opportunity to evaluate the cause of falls. In addition, we wanted to examine the clinical course and medical care costs of fall-related hospital admissions to contemplate a management policy for hip fracture patients.

Material and Method

The authors conducted a descriptive study at Siriraj Hospital and enrolled only older patients admitted with hip fractures between November 2010 and February 2012. The inclusion criteria were patients aged ≥60 years of age with history of fall from standing height resulting in hip fracture. The authors selected only individuals who fell from a standing height and sustained a hip fracture, as this is one of the most common mechanisms for hip fracture in the elderly. The authors excluded patients with pathologic fractures, high-energy trauma fractures, patients who sustained concurrent head injury who might not be able to recall the events associated with the fall, and those who were unwilling to participate in the study. The authors intentionally did not exclude participants with cognitive impairment as dementia has it been consistently reported to be a risk factor for falls. In patients with significant cognitive impairment, we interviewed fall witnesses and caregivers regarding the circumstances of the fall. Ethical approval for the present study was obtained from the Siriraj Institutional Review Board of Faculty of Medicine, Siriraj Hospital, Mahidol University. Informed consent was obtained from all the study participants and their caregivers.

There were 86 new onset hip fracture patients admitted to the general and special Orthopedic wards during the study period. After excluding four cases with pathological fractures and two cases with high-energy trauma fractures, 80 patients were included in the present study (93%).

All patients were initially assessed by internal medicine residents within 24 hours of admission, and the causes and events leading to the falls were recorded by geriatric medicine consultants. All patients were followed-up until discharge from the hospital. The data collected included baseline demographics, circumstances surrounding the falls, cognitive function of the patient, safety within the patients' house, hospital course and complications, length of the hospital stay and the direct cost of medical care during the hospital stay. Degree of disability or dependence was assessed by the modified Rankin Scale (mRS). The scale ranges from 0-6 (0 = no symptoms, 1 = no significant disability despite some symptoms/able to carry out all usual duties and activities, 2 = slight disability/able to look after own affairs without assistance, but unable to carry out all previous activities, 3 = moderate disability, requires some help, but able to walk without assistance; 4 = moderately severe disability/unable to attend to own bodily needs without assistance, and unable to walk without assistance, 5 = severe disability/requires constant nursing care and attention, bedridden, incontinent, and 6 = dead).

Statistical analysis

Characteristics of subjects, fall-related variables, cognitive function of the patient, safety within the patients' house, hospital course and complications, length of the hospital stay and the direct cost of medical care during the hospital stay were described using descriptive statistics. Statistical analysis was performed using SPSS for Windows version 18 software (Serial: 5082368 ID: 5071846).

Results

There were 18 males and 62 females in the present study. The mean age of the patients was 79.4 years (SD 7.9). The average Thai Mental State Exam (TMSE) score was 20.2 (SD 6.8). The TMSE could not be examined in four patients. Fifty-five percent of the participants used walking aids. The majority of the participants did not need a caregiver (83.8%) and 5% lived alone. Almost half of them (42.6%) had fallen previously and 6.3% had experienced previous fall-related fractures. Table 1 showed the baseline characteristics of the participants and their houses.

In terms of the actual falls, 78.6% fell indoors and 67.5% fell between 6 a.m. and 6 p.m. (i.e., daytime). The bedroom and bathroom were the

most frequent places where our patients fell indoors, whereas the front of house was the most frequent place for outdoor falls (12.5%). Table 2 summarized the falls-related events. Femoral neck fractures were more common than intertrochanteric fractures (61.3% vs. 37.5%), and the left side was more common involved (61.3% vs. 38.7%).

Falls were more commonly attributed to intrinsic factors compared to extrinsic factors (41.3% vs. 27.5%) especially in female patients (41.9% in

Table 1. Baseline characteristics of hip fracture patients with history of falls

Characteristics	Men (n = 18)	Women (n = 62)	Total
Age (mean ± SD)	81.4±6.1	78.8±8.2	79.4±7.9
BMI (mean ± SD)	20.7±3.4	22.5±3.7	22.1±3.7
Walking aids used, n (%)	10 (55.6)	34 (54.8)	44 (55.0)
Number of drugs used, n (%)			
None	1 (5.6)	4 (6.5)	5 (6.3)
≤4	9 (50.0)	19 (30.6)	28 (35.0)
>4	8 (44.4)	39 (62.9)	47 (58.8)
Co-morbid diseases, n (%)			
Hypertension	15 (83.3)	49 (79.0)	64 (80.0)
Dyslipidemia	8 (44.4)	25 (40.3)	33 (41.3)
Diabetes	5 (27.8)	22 (35.5)	27 (33.8)
Osteoarthritis	2 (11.1)	13 (21.0)	15 (18.8)
Dementia	4 (22.2)	10 (16.1)	14 (17.5)
Stroke	2 (11.1)	12 (19.4)	14 (17.5)
Chronic kidney disease	5 (27.8)	8 (12.9)	13 (16.3)
Coronary artery disease	3 (16.7)	9 (14.5)	12 (15.0)
Gout	3 (16.7)	7 (11.3)	10 (12.5)
Hypothyroidism	2 (11.1)	3 (4.8)	5 (6.3)
Osteoporosis	0 (0)	5 (8.2)	5 (6.3)
Parkinson's disease	0 (0)	4 (6.5)	4 (5.0)
Chronic obstructive pulmonary disease	3 (16.7)	1 (1.6)	4 (5.0)
Cancer	1 (5.6)	3 (4.8)	4 (5.0)
Hematocrit <30 (laboratory on admission)	6 (33.3)	18 (29.0)	24 (30.0)
Premorbid mRS, n (%)			
0	4 (22.2)	12 (19.4)	16 (20.0)
1	4 (22.2)	23 (37.1)	27 (33.8)
2	3 (16.7)	11 (17.7)	14 (17.5)
3	5 (27.8)	9 (14.5)	14 (17.5)
4	2 (11.1)	5 (8.1)	7 (8.8)
5	0 (0)	2 (3.2)	2 (2.5)
TMSE (mean ± SD)	19.0±7.7	20.5±6.5	20.4±7.1
	(n = 17)	(n = 59)	(n = 76)
Modified IQCODE	3.37 (3.00-5.00)	3.48 (2.70-5.00)	3.46 (2.70-5.00)
Living alone, n (%)	0 (0)	4 (6.5)	4 (5.0)
History of previous falls in 1 year, n (%)			
No falls	10 (55.6)	36 (58.1)	46 (57.5)
Falls without fractures	7 (38.9)	22 (35.5)	29 (36.3)
Falls with fracture	1 (5.6)	4 (6.5)	5 (6.3)
House, n (%)			
Thai traditional style	0 (0)	7 (11.3)	7 (8.8)
Multi-storey	15 (83.3)	52 (83.9)	67 (83.8)
Floor patients lived, n (%)			
First floor	15 (83.3)	46 (74.2)	61 (76.3)

mRS = modified rankin scale; TMSE = Thai mental state examination; IQCODE = informant questionnaire on cognitive decline in the elderly; BMI = body mass index

Table 2. Characteristics of events surrounding falls and their consequences

Fall-related events	Men (n = 18)	Women (n = 62)	Total (n = 80)
Location of hip fracture			
Neck of femur	9 (50.0%)	40 (64.5%)	49 (61.3%)
Intertrochanteric	9 (50.0%)	21 (33.9%)	30 (37.5%)
Subtrochanteric	0 (0%)	1 (1.6%)	1 (1.3%)
Indoor falls			
Total	13 (72.0%)	50 (80.6%)	63 (78.6%)
Bedroom	3 (16.7%)	17 (27.4%)	20 (25.0%)
Bathroom	5 (27.8%)	13 (16.1%)	18 (22.5%)
Kitchen	0 (0%)	5 (8.1%)	5 (6.3%)
Witnessed falls	9 (50.0%)	29 (46.8%)	38 (47.5%)
Time of falls			
6-12 a.m.	6 (33.3%)	22 (35.5%)	28 (35.0%)
12-18 p.m.	6 (33.3%)	20 (32.3%)	26 (32.5%)
18-24 p.m.	4 (22.2%)	11 (17.7%)	15 (18.8%)
24-6 a.m.	2 (11.1%)	9 (14.5%)	11 (13.8%)
Event leading to hip fracture			
Walking	12 (66.6%)	32 (51.6%)	44 (55.0%)
Standing	4 (22.2%)	19 (30.6%)	23 (28.8%)
Sitting	1 (11.1%)	6 (9.7%)	7 (8.8%)
Stairs	1 (11.1%)	2 (3.2%)	3 (3.8%)

women vs. 28.9% in men). Combined intrinsic and extrinsic factors were reported to be cause of falls up to 30% of the cases. Among the intrinsic factors, the five most common were neurological disorders (40%), musculoskeletal disorders (28.8%), visual impairment (18.8%), orthostatic hypotension (12.5%), and metabolic disorders (1.3%). There was a discrepancy between women and men in terms of the intrinsic causes. Women had more frequent musculoskeletal (33.9% vs. 11.1%) and visual problems (21.0% vs. 11.1%) as a cause, whereas men suffered from orthostatic hypotension more than women (27.8% vs. 8.1%). The three most common neurologic disorders causing falls were stroke (15%), Parkinson's disease (13.8%), and dementia (7.5%). The most common disorders of the musculoskeletal and visual systems causing falls were knee osteoarthritis (17.5%) and cataracts (16.3%), respectively. Among the extrinsic factors, slippery floors (22.5%), uneven flooring (8.8%), obstacles (6.3%), and inadequate lighting (3.8%) were the four most frequent causes of falls. Table 3 showed the causes of falls categorized as intrinsic/extrinsic and combined factors. Table 4 showed intrinsic causes of falls separated by disorders and sex.

Most patients received surgical operations (92.5%). The most common in-hospital complications were delirium (45%) and urinary tract infection (22.5%). Deep vein thrombosis and pulmonary embolism were documented in 1.3% patients each. The clinical course and discharge status as measured by the mRS were shown in Table 5. The in-hospital mortality was 3.8%. The median length of stay was 15 days (7 to 75 days). The direct costs of in-hospital care were 75,875 (23,817 to 260,976) bahts or $2,427 ($761 to $8,348) US dollars for general wards, and 116,883 (41,688 to 371,108) bahts or $3,739 ($1,333 to $11,871) US dollars for special wards.

Table 3. Causes of falls among the studied participants

Causes of falls	Men (n = 18)	Women (n = 62)	Total (n = 80)
Extrinsic causes	6 (33.3%)	16 (25.8%)	22 (27.5%)
Intrinsic causes	7 (28.9%)	26 (41.9%)	33 (41.3%)
Combined	5 (27.8%)	19 (30.6%)	24 (30.0%)
Unidentified	0 (0%)	1 (1.6%)	1 (1.3%)

Discussion

The majority of fall-related hip fractures occurred in women. Approximately half of our patients had fallen previously and used walking aids. Falls usually happened indoors during the daytime. Less than one-third of the falls occurred due to purely extrinsic causes. Intrinsic causes led to falls frequently in women. Neurological, musculoskeletal, and visual

Table 4. Comparison of the Intrinsic causes of falls between men and women

Intrinsic causes	Conditions	Men (n = 18)	Women (n = 62)	Total (n = 80)
Neurological disorders	Total	8 (44.4%)	24 (38.8%)	32 (40.0%)
	Stroke	2 (11.1%)	10 (16.1%)	12 (15.0%)
	Parkinsonism and Parkinson's disease	4 (22.2%)	7 (11.3%)	11 (13.8%)
	Dementia	2 (11.1%)	4 (6.5%)	6 (7.5%)
	Others	0 (0%)	3 (4.8%)	3 (4.8%)
Musculoskeletal disorders	Total	2 (11.1%)	21 (33.9%)	23 (28.8%)
	Osteoarthritis of knees	2 (11.1%)	12 (19.4%)	14 (17.5%)
	Gait instability	0 (0%)	2 (3.2%)	2 (2.5%)
	Rheumatoid arthritis	0 (0%)	2 (3.2%)	2 (2.5%)
	Previous femoral fracture	0 (0%)	1 (1.6%)	1 (1.3%)
	Kyphoscoliosis	0 (0%)	1 (1.6%)	1 (1.3%)
	Spinal stenosis	0 (0%)	1 (1.6%)	1 (1.3%)
	Joint contracture	0 (0%)	1 (1.6%)	1 (1.3%)
	Osteoarthritis + kyphosis	0 (0%)	1 (1.6%)	1 (1.3%)
Visual impairment	Total	2 (11.1%)	13 (21.0%)	15 (18.8%)
	Cataract	2 (11.1%)	11 (17.7%)	13 (16.3%)
	Blindness	0 (0%)	1 (1.6%)	1 (1.3%)
	Glaucoma	0 (0%)	1 (1.6%)	1 (1.3%)
Orthostatic hypotension		5 (27.8%)	5 (8.1%)	10 (12.5%)
Metabolic causes		1 (5.6%)	0 (0%)	1 (1.3%)

Table 5. Clinical course in the hospital and cost of the medical care among older persons with falls-related hip fracture

Clinical courses	Variables	Men (n = 18)	Women (n = 62)	Total (n = 80)
Surgical treatment		16 (88.9%)	58 (93.5%)	74 (92.5%)
In-hospital complications	Delirium	7 (38.9%)	29 (46.8%)	36 (45.0%)
	Urinary tract infection	2 (11.1%)	16 (25.8%)	18 (22.5%)
	Pneumonia	2 (11.1%)	5 (8.1%)	7 (8.8%)
	Atelectasis	0 (0%)	2 (3.2%)	2 (2.5%)
	Bronchitis	0 (0%)	2 (3.2%)	2 (2.5%)
	Acute gouty attack	2 (11.1%)	1 (1.6%)	2 (2.5%)
	Congestive heart failure	0 (0%)	2 (3.2%)	2 (2.5%)
	Diarrhea	2 (11.1%)	1 (1.6%)	2 (2.5%)
	Deep vein thrombosis	0 (0%)	1 (1.6%)	1 (1.3%)
	Pulmonary embolism	0 (0%)	1 (1.6%)	1 (1.3%)
	Colitis	0 (0%)	1 (1.6%)	1 (1.3%)
	Hypoglycemia	2 (11.1%)	0 (0%)	1 (1.3%)
	Pleural effusion	0 (0%)	1 (1.6%)	1 (1.3%)
Discharge mRS	3	4 (22.2%)	11 (17.7%)	15 (18.8%)
	4	9 (50.0%)	34 (54.8%)	43 (53.8%)
	5	5 (27.8%)	14 (22.6%)	19 (23.8%)
	6 (death)	0 (0%)	3 (4.8%)	3 (3.8%)
Length of stays in days, median (range)		15 (8-37)	15 (5-75)	15 (5-75)
Cost of care, median (range)	General wards	76,185.50 baht (51,803.00-200,169.50) 2,437.1 US dollars (1,657.2-6,403.4)	75,875.00 baht (23,817.00-260,976.50) 2,427.2 US dollars (761.9-8,348.6)	75,875.00 baht (23,817.00-260,976.50) 2,427.2 US dollars (761.9-8,348.6)
	Special wards	89,289.25 baht (54,042.00-142,155.00) 2,856.3 US dollars (1,728.8-4,547.5)	129,869.00 baht (41,688.00-371,108.50) 4,154.5 US dollars (1,333.6-11,871.7)	116,883.00 baht (41,688.00-371,108.50) 3,739.1 US dollars (1,333.6-11,871.7)

mRS = modified rankin scale

problems as well as orthostatic hypotension were the leading causes of falls in the present study. The causes were different in men and women. Women more commonly demonstrated intrinsic causes and more prevalence of musculoskeletal and visual impairment, whereas men had a higher prevalence of orthostatic hypotension.

The prevalence of falls from a standing height resulting in hip fractures was 93% (80/86 cases). A previous study reported that fractures occurred in a quarter of fall victims[14]. The proportion of fall-related hip fractures varied between 34.2% in indoor falls and 12.1% in outdoor falls[8]. A previous study reported a discrepancy in intrinsic factors as a cause of falls between indoor (44.3%) and outdoor (19.9%)[8]. The majority of patients (78.6%) in the present study fell indoors, and these falls were attributed to intrinsic causes (pure and combined with extrinsic causes) in 71.3% of cases. The bedroom and bathroom were the two most common indoor locations. The authors found that the majority of the fall-related hip fractures occurred in the daytime (67.5% between 6 a.m. to 6 p.m.). This finding contradicts the finding by Jitapunkul et al, who reported that most falls occurred outdoors[2]. The present study aimed to investigate more serious falls that led to major injury. It was likely that participants in the present study were frailer, as evidenced by their older age and having co-morbid illnesses. However, our findings were in agreement with those reported by Luukinen et al, where the patient characteristics were similar to the present study[8]. The results of our study would be more applicable for contemplating a plan for preventing serious falls that led to increase burden for patients, families and the society.

Most of the patients received the appropriate surgical management, but still had residual functional impairment at discharge. The median length of hospital stay was 15 days, which is slightly shorter than the stays of 17 and 19.1 days previously reported by Suriwongpaisan et al[15] and Raksakietisak et al[16], respectively. The most frequent postoperative complication was delirium. The incidence of postoperative delirium had been reported to vary between 16% to 62%, which was similar to our finding (45%)[17]. Additionally, the incidence of deep vein thrombosis was 1.3%, which was similar to 0.8% previously reported by Johal et al[18]. The mortality rate during hospitalization in the present study was similar to those reported in previous studies by Chariyalertsak et al[13] and Raksakietisak et al[16].

The direct cost of medical care during hospitalization in the present study was much higher than 11,893.33 bahts (380.5 US dollars) as reported 18 years ago. Recently, a study by Limpawattana et al showed that the average healthcare cost in older individuals with fractures was 25,728 bahts (823.0 US dollars) and that the median length of hospital stay was 8.1 days[6]. This difference may be because the authors of that study included all fall-related fractures. Hip fracture generally results a longer hospital stay, thus resulting in higher costs. The cost in the present study was similar to that reported by a medical school in Bangkok[19]. The financial cost of the care of hip fractures in the present study was much lower than previously reported by Lawrence et al (19,719.2 US dollars)[20].

The present study had several strengths. Previously, most studies reported only risk factors for falls and were retrospective in nature. The exact causes of falls were difficult to determine and were thus not reported. The authors integrated both intrinsic and extrinsic causes of falls as evaluated by geriatricians. As we studied the falls admitted to a hospital, we had the opportunity to thoroughly and comprehensively gather information needed from both patients and their family members. This allowed us to validate causes of falls even in cognitively impaired elderly individuals in whom self-reported fall events might not be entirely reliable. Necessary investigations were also performed to determine the cause of falls, and the course of hospital stay was thoroughly documented.

The authors included only patients with falls resulting in hip fractures because such patients were hospitalized, giving the investigators more time to evaluate the cause of falls. Hence, the causes reported in the present study were likely to be accurate. Additionally, hip fracture is a serious and expensive consequence of falls. Preventive strategies following the present study would likely lead to practical and beneficial results.

Some limitations in the present study should be addressed. First, as there were a relatively small number of participants, further study may be needed to confirm our findings. Second, the short-term follow-up of the present study i.e. only up to the time of discharge from the hospital, limited the applicability of our results to long-term consequences of falls, which are not trivial. A longer-term follow-up with more details about the patients' physical limitations and impact on his/her family members in Thai

society would be beneficial. However, they had been investigated in other previous reports[13,21].

In summary, the present study provided insights from a comprehensive assessment of falls with hip fractures in older patients in terms of their causes and clinical course during hospital stay. Interventions to reduce the incidence of falls and improve hip fracture care in hospitals can then be targeted more accurately to populations at the highest risk.

What is already known on this topic?

Data attributing falls are usually derived for epidemiologic studies.

However, the exact causes of falls have rarely been investigated in the elderly who fell.

Falls frequently result in fractures and other serious consequences, and one of the most serious among these is a hip fracture.

What this study adds?

Less than one-third of the falls occurred due to purely extrinsic causes. Intrinsic causes led to falls frequently in women.

Women had more frequent musculoskeletal and visual problems as a cause, whereas men suffered from orthostatic hypotension more than women.

The most common in-hospital complications were delirium and urinary tract infection, while deep vein thrombosis and pulmonary embolism were uncommon.

Interventions to reduce the incidence of falls and improve hip fracture care in hospitals can then be targeted more accurately to populations at the highest risk.

Potential conflicts of interest

None.

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สาเหตุและการดำเนินโรคของการหกล้มที่ทำให้เกิดกระดูกข้อสะโพกหักในผู้ป่วยสูงอายุไทย

วีรศักดิ์ เมืองไพศาล, สราวุธ สุวรรณปทุมเลิศ, วราลักษณ์ ศรีนนท์ประเสริฐ, วีระศักดิ์ สุทธิพรพลางกูร, อสิตา วงศ์ไพรกรณ์, ประเสริฐ อัสสันตชัย

วัตถุประสงค์: *เพื่อหาสาเหตุของการหกล้มและการดำเนินโรคของภาวะกระดูกสะโพกหักที่เกิดจากการหกล้มในผู้สูงอายุที่เข้ารับการรักษาในโรงพยาบาล*

วัสดุและวิธีการ: *ผู้นิพนธ์เก็บข้อมูลผู้สูงอายุที่รับเข้ารักษาในโรงพยาบาลด้วยปัญหากระดูกสะโพกหักจากการหกล้ม สาเหตุของการหกล้มและการดำเนินโรคได้รับการประเมินโดยอาจารย์แพทย์ด้านเวชศาสตร์ผู้สูงอายุ และติดตามผู้ป่วยทุกรายจนจำหน่ายออกจากโรงพยาบาล*

ผลการศึกษา: *การหกล้มมักเกิดขึ้นภายในอาคาร (ร้อยละ 78.6) ในช่วงเวลากลางวัน (ร้อยละ 67.5) สาเหตุของการหกล้มที่เกิดจากปัจจัยภายนอกเพียงอย่างเดียวพบได้ร้อยละ 27.5 ปัญหาทางระบบประสาท กระดูกและกล้ามเนื้อ การมองเห็น และภาวะความดันเลือดตกขณะลุกขึ้น เป็นสาเหตุหลักของการหกล้มในการศึกษานี้ ผู้หญิงเกิดจากสาเหตุภายในมากกว่า (ร้อยละ 41.9 เทียบกับร้อยละ 28.9) เช่น โรคระบบกล้ามเนื้อและกระดูก (ร้อยละ 33.9 เทียบกับร้อยละ 11.1) และการบกพร่องของการมองเห็น (ร้อยละ 21.0 เทียบกับร้อยละ 11.1) ในขณะที่การหกล้มในผู้ชายมีแนวโน้มเกิดจากภาวะความดันเลือดตกขณะลุกขึ้น (ร้อยละ 21.8 เทียบกับร้อยละ 8.1) ผู้ป่วยเกือบทุกรายได้รับการรักษาโดยการผ่าตัด (ร้อยละ 92.5) ภาวะแทรกซ้อนที่พบบ่อยที่สุดในโรงพยาบาล คือ อาการซึมสับสนเฉียบพลัน (ร้อยละ 45) ร้อยละ 46.3 ของผู้ป่วยได้คะแนน modified Rankin Scale ระดับ 2 ถึง 5 ขณะจำหน่ายออกจากโรงพยาบาล และร้อยละ 3.8 เสียชีวิต ค่ามัธยฐานของระยะเวลาเฉลี่ยของการนอนในโรงพยาบาล คือ 15 วัน (อยู่ในช่วง 7 วัน ถึง 75 วัน) ค่าใช้จ่ายตรงในการรักษาพยาบาลในโรงพยาบาล คือ 2,427.2 (761.9-8,348.6) ดอลลาร์สหรัฐ สำหรับหอผู้ป่วยทั่วไป และ 3,739.1 (1,333.6-11,871.7) ดอลลาร์สหรัฐ สำหรับหอผู้ป่วยพิเศษ*

สรุป: *สาเหตุภายใน (ไม่ว่าเพียงอย่างเดียวหรือร่วมกับสาเหตุภายนอก) นำไปสู่การหกล้มที่ทำให้เกิดกระดูกข้อสะโพกหักบ่อยกว่าสาเหตุภายนอก ผู้หญิงและผู้ชายมีสาเหตุของการหกล้มที่แตกต่างกัน กระดูกข้อสะโพกหักทำให้เกิดภาวะแทรกซ้อนในโรงพยาบาลได้หลากหลายและทำให้เกิดการสูญเสียความสามารถในการประกอบกิจวัตรประจำวัน การป้องกันโดยอาศัยข้อมูลที่ได้จากการศึกษานี้น่าจะนำมาซึ่งความแม่นยำและเกิดประโยชน์ต่อการดูแลผู้ป่วยต่อไป*
