

Fall With and Without Fracture in Elderly: What's Different?

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Falling fracture was one of the health problems in elderly. This presentation aimed to identify the factors of fall that caused fractures. The retrospective case-control study was designed. Samples were all who experienced fall within 1 year in Lamphun. Factors included age, gender, underlying diseases, chronic drugs used, history of parent fragility fracture, age of menopause, steroid used, body mass index, visual acuity and time up and go test were studied. Multivariate regression analysis was used. 336 cases of fractures in 1,244 cases of fall were found. Significant factors of falling fracture group that were different from fall without fracture group included age, female gender, menopause before age of 45 and visual impairment. Visual impairment was the other key factor rather than osteoporosis that caused fall with fracture. The author suggested that falling fracture prevention programs should be included correction of visual impairment other than osteoporosis treatment.

Keywords: Fall, Osteoporotic fracture, Falling fracture

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Most fractures in elderly were caused by fall. Falling fracture was one of the health problems in this age group. After fracture, the quality of life was markedly decreased. Mortality in first year after hip fracture was up to 18%⁽¹⁾. Risk of fractures was increased 4 times in osteoporosis⁽²⁾. Common falling fractures such as vertebral fracture, hip fracture and distal radius fracture were closely related to osteoporosis⁽³⁾.

Factors which related to fall included aging, history of fall in past 1 year, underlying diseases caused syncope, drugs involved consciousness, visual impairment, muscle strength and balance⁽⁴⁾. Factors which related to osteoporosis included aging, gender, body mass index (BMI), history of parental fragility fracture, age of menopause, steroid used, underlying diseases caused osteopenia and drugs involved calcium metabolism⁽⁵⁾.

There were many tools for evaluation risks of fall and osteoporosis. Visual acuity at 6 meters was recommended for screening visual impairment. Time up and go test (TUGT) was effective for evaluation muscle strength and balance⁽⁶⁾. Systemic literature review demonstrated that a small number of significant

fall risk factors emerged consistently⁽⁷⁾. Identification of essential risks for prevention programs may be available. This presentation aimed to identify the factors of fall that caused fractures.

Material and Method

The retrospective case-control study was designed. Population falling surveys of 65 years old and above were done in Lamphun since January 2011 to June 2011. Samples were all who experienced fall within 1 year. Cases included who fell with hip fractures, vertebral fractures and distal radius fractures. Controls included who fell without fractures. Factors included age, gender, underlying diseases (such as hypertension, rheumatoid arthritis, chronic liver or renal diseases), chronic drugs used (such as hypotensive drugs, hypnotic or antidepressive drugs, diuretics, anticonvulsants or thyroid hormone), history of parent fragility fracture, age of menopause and steroid used were interviewed. Tests included body mass index, visual acuity by finger count at 6 meters and time up and go test were examined. Multivariate regression analysis was calculated at 0.05 p-value. STATA statistics program was used.

Results

1,244 cases of fall from 10,329 surveys were found. 336 cases of fractures were identified. Different factors between fall with fracture and fall without fracture were age, body mass index, gender, history of

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parent fragility fracture, age of menopause and visual impairment (Table 1). Analysis by multivariate regression was found that age, female gender, age of menopause and visual impairment were significant factors of falling with fracture (Table 2).

Discussion

This presentation studied factors of fall and osteoporosis, not included environment factors. Community surveys by local health care workers were effective for deep interview data. The tests used in the presentation were simple. Falling fracture was one of the bad experience that could be easy recognized.

Prevalence of fall in elderly population in Lamphun was 12% that equal to National Statistics survey⁽⁸⁾ and 27% of fall had fractures. Significant factors of falling fracture group that were different from fall without fracture group included age, female gender, menopause before age of 45 and visual impairment. Age of 75 and above was known to be high risk of osteoporotic hip fracture⁽⁹⁾. Female gender and menopause before age of 45 were the major risk factors of osteoporosis⁽¹⁰⁾. Visual impairment was defined as visual acuity less than 6/60 that was used in the presentation⁽¹¹⁾. This problem has been implicated as a risk factor for fall and fractures, but results of previous

Table 1. Different factors of fall with and without fracture in elderly

	Fall with fracture n = 336	Fall without fracture n = 908	p-value
1. Age	75.8 ± 6.5	74.9 ± 6.4	0.02
2. BMI	20.5 ± 3.8	21.1 ± 3.8	0.03
3. Gender			0.00
Female	235 (30.1%)	547 (69.9%)	
Male	101 (21.9%)	361 (78.1%)	
4. Underlying diseases			0.19
No	170 (25.9%)	486 (74.1%)	
Yes	166 (28.2%)	422 (71.8%)	
5. Drugs used			0.32
No	176 (26.4%)	491 (73.6%)	
Yes	160 (27.7%)	417 (72.3%)	
6. Parent fragility fracture			0.03
No	301 (26.3%)	844 (73.7%)	
Yes	35 (35.4%)	64 (64.6%)	
7. Age of menopause			0.00
45 up	141 (26.2%)	398 (73.8%)	
45 less	93 (38.7%)	147 (61.3%)	
8. Steroid used			0.09
No	316 (20.6%)	872 (73.4%)	
Yes	20 (35.7%)	36 (64.3%)	
9. Visual acuity			0.01
Normal	203 (24.9%)	613 (75.1%)	
Impaired	133 (31.1%)	295 (68.9%)	
10. TUGT	17.5 ± 10.7	17.8 ± 10.2	0.99

Table 2. Influence factors of falling fracture in elderly

Factors	Odd ratio	95% Confidence	p-value
Age	1.03	1.00-1.05	0.04
BMI	0.97	0.93-1.01	0.16
Gender	2.83	1.17-6.82	0.02
Parent fragility fracture	1.33	0.78-2.26	0.29
Age of menopause	1.64	1.18-2.29	0.00
Visual acuity	1.39	1.00-1.94	0.05

studies have been inconsistent⁽¹²⁾. The presentation confirmed that visual impairment as the risk of falling fracture.

Low body mass index and history of parental fragility fracture involved only osteoporosis risk⁽¹³⁾. Underlying diseases and chronic drugs used especially steroid had no effect in falling fracture. Although steroid was proven to be the important cause of osteoporosis⁽⁵⁾. Time up and go test was the effective test to determine falling risk^(5,13) but not for falling fracture.

From the present study, visual impairment was not only the factor of fall but also caused fractures. This might be fall among impaired vision persons made them loss of self protection. Exercise programs to prevent fall were found to have positive effects in non-frail elderly persons but not in frail elderly⁽¹⁴⁾. Therefore, prevention programs for falling fracture should not be included only osteoporosis treatment but also correction of visual impairment.

In conclusion, visual impairment was one of the other key factor rather than osteoporosis that caused fall with fracture.

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Potential conflicts of interest

None.

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ความแตกต่างระหว่างการหกล้มที่มีกระดูกหักและไม่หักในผู้สูงอายุ

ชชาติ ชันตยาภรณ์

ภาวะกระดูกหักจากการหกล้มในผู้สูงอายุเป็นปัญหาทางสาธารณสุขที่สำคัญปัญหาหนึ่ง การศึกษานี้มีวัตถุประสงค์เพื่อค้นหาปัจจัยที่ส่งผลให้เกิดกระดูกหักจากการหกล้ม โดยการสำรวจผู้สูงอายุในจังหวัดลำพูนที่มีประวัติเคยหกล้มภายใน 1 ปีที่ผ่านมา ใช้ระเบียบวิธีวิจัยการศึกษาย้อนหลังแบบเคสคอนโทรล ปัจจัยที่นำมาศึกษาได้แก่ อายุ เพศ โรคประจำตัว ยาที่กินประจำ ประวัติกระดูกหักง่ายในพ่อแม่ อายุที่หมดประจำเดือน การเข้ายาสเตียรอยด์ ดัชนีมวลกาย การทดสอบสายตา และการทดสอบ Time up and go test การศึกษานี้ทดสอบปัจจัยด้วยสถิติ การวิเคราะห์ถดถอยพหุแบบลอจิสติก จากการศึกษาพบว่า จากจำนวนผู้สูงอายุที่ศึกษาทั้งหมด 10,329 ราย พบผู้สูงอายุที่มีประวัติหกล้ม 1,244 ราย มีกระดูกหัก 336 ราย ปัจจัยที่เกี่ยวข้องอย่างมีนัยสำคัญทางสถิติได้แก่ อายุ เพศหญิง หมดประจำเดือนก่อนอายุ 45 ปี และภาวะความผิดปกติของสายตา ปัญหาสายตาจึงเป็นอีกปัจจัยสำคัญที่เกี่ยวข้องกับกระดูกหักจากการหกล้มนอกเหนือไปจากปัจจัยเสี่ยงต่อภาวะกระดูกพรุน เพราะฉะนั้น การป้องกันกระดูกหักจากการหกล้มในผู้สูงอายุ นอกจากเรื่องภาวะกระดูกพรุนแล้ว ควรเน้นเรื่องการแก้ปัญหาสายตาด้วย
