

Original article

# One-year mortality rate after osteoporotic hip fractures and associated risk factors in Police General Hospital

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Received 10 April 2015; accepted 25 June 2015

Available online 30 August 2015

## Abstract

**Objectives:** The purpose of this study was to investigate the mortality rate and other associated risk factors a year after diagnosis of osteoporotic hip fracture.

**Methods:** A prospective cohort study was carried out in 120 patients who were at least 50 years of age who presented with a hip fracture caused by a simple fall and were admitted to Police General Hospital in 2013. Background data, mortality rate and associated risk factors were collected and evaluated.

**Results:** There were 88 females (73.33%) and 32 males (26.67%). The average age was 79.4 years. Eleven patients were deceased by the end of this study. The mortality rate was about 3.3 times higher when compared to the general population in the same age range (9.2% vs 2.28%). The survival rates for both sexes at 6 weeks, 6 months and 12 months after fracture were 94.2%, 93.3% and 90.8%, respectively. Higher mortality was associated with non-operative treatment only. Patients who were treated non-operatively had a 3.93 times higher mortality risk when compared to those who were treated operatively (23.8% vs 6.1%).

**Conclusions:** This study shows that the one-year mortality rate of osteoporotic hip fracture patients who were 50 years or older was 9%. However, the rate increased after an osteoporotic hip fracture, especially within the first year post-fracture. Higher mortality was associated with non-operative treatment only while the other variables were not.

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**Keywords:** Osteoporotic hip fractures; Mortality rate; Associated factors

## 1. Introduction

Osteoporosis fractures occur in approximately 2% of Thai women each year [1]. An average incidence of hip fractures is 7.05 per 100,000 annually. Hip fracture is a common serious injury that affect mainly elderly patients. The incidence of hip fractures increases with increasing age [2] 0.20% of patients die within the first year after a hip fracture [3], and one in four elderly patients require a higher level of long-term care after a

hip fracture [3,4]. The mortality rate during hospitalization was 2.1%. The 3-, 6-, and 12-month survival rates after hip fractures were 91%, 88% and 83%, respectively [5].

The purpose of the study was to examine the 1-year mortality rate after osteoporotic hip fracture and also to study other associated risk factors, which include gender, age, BMI, fracture sites, and fracture treatment.

## 2. Methods

A prospective cohort of the study was conducted from January 1st to December 31st 2013 with a sample size of 120 patients who sustained hip fractures and were admitted to the Police General Hospital during the research period.

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Peer review under responsibility of The Korean Society of Osteoporosis.

Police General Hospital is currently a fully-fledged state-run general 800-bed hospital and tertiary trauma center. The location is in the city center of Bangkok, Thailand. This hospital provides care to all patients, Thai and foreign, and is fully accessible to the general population in Thailand and offers all the standard medical services expected from an accredited national medical facility.

The study's inclusion criteria was restricted to male and female patients at least 50 years of age with a hip fracture at either femoral neck, intertrochanteric or subtrochanteric locations, with the fracture being caused by a simple fall. Exclusion criteria included secondary osteoporosis, severe accidents such as a traffic accident and fractures caused by cancer. Information regarding age, gender, parenteral hip fracture, previous fracture, fracture sites, fracture treatment, type of operation, previous BMD, hospitalization periods, underlying disease, outcome and osteoporotic medications were obtained from the hospital record. Information in regards to outpatient visits were carried out through their 6 weeks, 6 months and 12 months post-injury visits. In the case that a patient did not come for the follow up appointment at the outpatient clinic, we contacted either the patient directly or the patient's relatives by telephone. Mortality was identified by telephone interview and from the Thailand Civil Registration Office database. 90% of the patients who missed follow up were successfully contacted by phone and data was obtained as to whether they were deceased or still alive. If we could not contact them within one month of their scheduled follow up date, we checked the Thailand civil registration office database to see whether or not they were deceased.

Statistical analysis was performed using Stata software version 12.0. Continuous data were presented as mean and standard deviation. Categorical data were presented as proportion. The Kaplan–Meier test was used to estimate survival rate and log-rank test was used to compare two survival curve. The Cox proportional hazards model was used to determine the relationship between potential associated factors and mortality. The relative risk test and 95% CI were used to select associated factors.

### 3. Results

The demographics of patients who met the eligibility criteria are summarized in Table 1. There were 88 females (73.33%) and 32 males (26.67%) included in this study. The average age was 79.4 years (female, 79.76 yr; male, 78.4 yr). In terms of age, 52 patients (43%) were over 80 years of age. In terms of location of fracture, 55 patients (45.83%) had a femoral neck fracture, 63 patients (52.5%) had an intertrochanteric fracture and 2 patients (1.67%) had a subtrochanteric fracture. Twelve (10.00%) patients had previous fractures, with 10 patients (8.33%) having had previous hip fracture, 1 patient (0.83%) with previous spine fracture and 1 patient (0.83%) with previous proximal humeral fracture. Three patients had a parenteral hip fracture. In terms of treatment, 99 patients (82.5%) underwent operative treatment, whereas the remainder 21 patients (17.5%) were

Table 1  
General demographics data of osteoporotic hip fracture patients.

Characteristic	Number (%)
Age (y)	
≤80	68 (57%)
>80	52 (43%)
Sex	
Male	32 (26.67%)
Female	88 (73.33%)
Parenteral hip fracture (case)	3 (2.5%)
Previous fracture (case)	12 (10.00%)
Hip	10 (8.33%)
Spine	1 (0.83%)
Proximal humerus	1 (0.83%)
Location of fracture (case)	
Femoral neck	55 (45.83%)
Intertrochanter	63 (52.5%)
Subtrochanter	2 (1.67%)
Type of treatment (Case)	
Operation	99 (82.5%) [46/53]
[ <i>femoral neck/trochanter</i> ]	
Non operation [ <i>femoral neck/trochanter</i> ]	21 (17.5%) [9/12]
Type of operation (case)	
<i>Fixation</i>	56 (56.57%)
- Proximal femoral nail antirotation (PFNA)	41 (41.41%)
- Dynamic hip screw (DHS)	10 (10.10%)
- Multiple screw	3 (3.03%)
- Locking plate	1 (1.01%)
- Angle blade plate	1 (1.01%)
<i>Arthroplasty</i>	43 (43.43%)
- Hemiarthroplasty	39 (39.39%)
- Total hip arthroplasty	4 (4.04%)
BMD investigation (case)	
Pre fracture	8 (6.67%)
Post fracture	34 (28.33%)
Hospitalization (day)	
Operative	Average 23.16 (Max 69:Min 6)
Non-operative	Average 25.86 (Max 102:Min 5)
Time to surgery (day)	
<i>Fixation</i>	Average 7.896 (Max 33:Min 1)
<i>Arthroplasty</i>	Average 7.853 (Max 24:Min 1)
Osteoporotic drug (case)	
Calcium and Vitamin D	25 (20.83%)
Antiresorptive agents	18 (15%)
Anabolic agent	6 (5%)
Underlying disease	
Hypertension	84 (70%)
Dyslipidemia	33 (27.5%)
Diabetes mellitus	21 (17.5%)
Outcome (case)	
Death	11 (9.17%)
Alive	109 (90.83%)

treated non-operatively. The most common reason for non-operative treatment was severe underlying medical conditions such as congestive heart failure, myocardial infarction, complicated pneumonia, renal failure and large infected bedsores, which were present in 70% of the patients who were treated non-operatively. The remaining 30% who were treated non-operatively was from either the patient or the patient relatives denying treatment. Operative treatment was either by fixation or arthroplasty. Forty-one cases (41.41%) received proximal femoral nail antirotation (PFNA) fixation,

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