



## Original article

## Trends in post osteoporotic hip fracture care from 2010 to 2014 in a private hospital in Malaysia



Swan Sim Yeap<sup>a,\*</sup>, M.F.R. Nur Fazirah<sup>b</sup>, C. Nur Aisyah<sup>b</sup>, Siti Yazmin Zahari Sham<sup>c</sup>,  
Intan Nureslyna Samsudin<sup>c</sup>, Subashini C. Thambiah<sup>c</sup>, Fen Lee Hew<sup>a</sup>, Boon Ping Lim<sup>d</sup>,  
Yew Siong Siow<sup>d</sup>, Siew Pheng Chan<sup>a</sup>

<sup>a</sup> Department of Medicine, Subang Jaya Medical Centre, Subang Jaya, Selangor, Malaysia

<sup>b</sup> Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Selangor, Malaysia

<sup>c</sup> Department of Pathology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Serdang, Malaysia

<sup>d</sup> Department of Orthopaedic Surgery, Subang Jaya Medical Centre, Subang Jaya, Selangor, Malaysia

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## ABSTRACT

**Objective:** Following an osteoporotic fracture, pharmacological treatment is recommended to increase bone mineral density and prevent future fractures. However, the rate of starting treatment after an osteoporotic hip fracture remains low. The objective of this study was to survey the treatment rate following a low-trauma hip fracture at a tertiary private hospital in Malaysia over a period of 5 years.

**Methods:** The computerised hospital discharge records were searched using the terms “hip,” “femur,” “femoral,” “trochanteric,” “fracture,” or “total hip replacement” for all patients over the age of 50, admitted between 2010 and 2014. The medical charts were obtained and manually searched for demographic data and treatment information. Hip operations done for non-low-trauma-related fracture and arthritis were excluded.

**Results:** Three hundred seventy patients over the age of 50 years were admitted with a hip fracture, of which 258 (69.7%) were low trauma, presumed osteoporotic, hip fractures. The median age was 79.0 years (interquartile range [IQR], 12.0). Following a hip fracture, 36.8% (95 of 258) of the patients received treatment, but out of these, 24.2% (23 of 95) were on calcium/vitamin D only. The median duration of treatment was 1 month (IQR, 2.5). In 2010, 56.7% of the patients received treatment, significantly more than subsequent years 2011–2014, where approximately only 30% received treatment.

**Conclusions:** Following a low-trauma hip fracture, approximately 72% of patients were not started on active antiosteoporosis therapy. Of those who were, the median duration of treatment was 1 month. This represents a missed opportunity for the prevention of future fractures.

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## 1. Introduction

Osteoporosis is defined as a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture [1]. Typical osteoporosis fractures occur in the wrist, spine and hip. All osteoporosis fractures, especially at the hip, substantially increase the risk of death in the near term and are a major cause of morbidity in the elderly [2]. One-year mortality rates

have ranged from 12% to 37% with approximately 50% of patients unable to regain their ability to live independently [2]. In addition, since a prior fracture is a well-established risk factor for future fracture [3], it is therefore recommended that after a fragility fracture, all patients be assessed and treated for osteoporosis [4,5].

However, rates of treatment following a hip fracture are widely variable; but generally rather poor. An Italian study has shown 78% of patients receiving pharmacological treatment and 68.7% given calcium and vitamin D (CaD) after a hip fracture [6]. Conversely, other studies have shown treatment rates as low as 6% in Belgium [7], 7.2%–13% in USA [8,9], 15% in the Netherlands [10], 25% in Spain [8] to 39% in Finland [11]. In the limited number of studies with Asian patients, it was found that 33% of patients were given medication for osteoporosis after hospitalisation for a hip fracture

\* Corresponding author. Subang Jaya Medical Centre, 47500, Subang Jaya, Selangor, Malaysia.

E-mail address: [swanyeap@gmail.com](mailto:swanyeap@gmail.com) (S.S. Yeap).

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[12] and 39% of patients from Korea filled more than one prescription for medication for osteoporosis after a hip fracture [8].

The objective of this study was to survey the postdischarge low-trauma hip fracture treatment rate at an urban tertiary care private hospital in Malaysia.

## 2. Methods

This was a retrospective study based on medical record review. The computerized hospital discharge records were searched using the terms “hip,” “femur,” “femoral,” “trochanteric,” “fracture,” or “total hip replacement” for all patients over the age of 50, admitted between the years of 2010–2014. The medical records were obtained and manually searched for information on patients' demographics and their pharmacological treatment for osteoporosis. Patients who had hip operations for traumatic fractures or for arthritis were excluded.

Ethical approval for the study was obtained from the Independent Ethics Committee, Ramsay Sime Darby Healthcare (Ethics Committee reference 201211.5) and the Ethics Committee Universiti Putra Malaysia (JKEUPM) (JKEUPM reference No. FPSK [EXP16-Medic]U036).

Statistical analysis was performed using IBM SPSS Statistics ver. 22.0 (IBM Co., Armonk, NY, USA). The analysis of variance (1-way analysis of variance) was used to examine the differences in age and body mass index, and the 2-tailed Student t-test was used to assess any differences between those given treatment and those who were not, between the years 2010–2014.

## 3. Results

From 1 January 2010 to 31 December 2014, there were 370 patients over the age of 50 with hip fractures/operations. After excluding patients who had procedures for trauma (non-low-trauma) or arthritis, there was 258 (69.7%) presumed osteoporotic fractures.

There were 193 female (74.8%) and 65 male patients (25.2%). The median age was 79.0 years (interquartile range [IQR], 12.0 years). There were 20 Malays (7.8%), 200 Chinese (77.5%), 31 Indians (12.0%), and 7 other races (2.7%). There were 35 patients (12.6%) who were noted to have had a previous low-trauma fracture, of whom 4 received medication. Of these, 3 patients received a bisphosphonate with calcium (duration of treatment 1 month, 1 year, and 2 years) and the other patient received CaD alone (duration of treatment not known).

The number of patients who were treated or not treated in each year is shown in Table 1. Significantly more patients were treated in 2010 compared to the later years; however, there was no difference in the number of patients treated in the years 2011–2014 (chi-square,  $P > 0.05$  for comparisons between all years 2011–2014 [data not shown]). Overall, 95 of 258 (36.8%) received treatment after their hip fracture, but out of these, 23 of 95 (24.2%) were

prescribed calcium/vitamin D only, leaving 72 of 95 (75.8%) given active osteoporosis treatment. Thus overall, 72 of 258 (27.9%) of the total osteoporotic hip fracture population given active osteoporosis therapy.

Table 2 shows the various types of treatment given in each year of the study. Forty-seven of 95 patients (49.5%) received calcium/CaD/vitamin D together with active osteoporosis medication. The most commonly prescribed antiosteoporosis medication was the bisphosphonates with 37 prescriptions (38.9%), both on its own or in combination. Of these, 17 patients were given intravenous (IV) zoledronate. Overall mean duration of treatment was  $3.35 \pm 4.44$  months, median, 1.0 months (IQR, 2.5 months). Excluding those who had IV zoledronate, the mean duration of treatment was  $1.26 \pm 1.28$  months, median, 1.0 months (IQR, 0.81 month).

Table 3 shows the types of hip fracture, the operations performed and the outcome. Although the majority of hip fractures were at the femoral neck, there were 15 of 258 femoral shaft fractures (5.8%), which would have included any possible atypical fractures. However, none of these femoral shaft fractures were reported as atypical fractures by the radiologists. None of the patients with femoral shaft fractures had been on bisphosphonates. Median duration of hospital stay was 7 days (IQR, 4 days). At 3 months, only 26 patients (10.1%) returned for a follow-up visit, with consecutive reduction in patient follow-up at 6 months and 12 months with 9 (3.5%) and 3 patients (1.2%), respectively.

## 4. Discussion

This study was conducted at a private hospital with 393 beds in an urban area. The hospital has a busy Accident and Emergency Department and would be the main hospital for anyone seeking private medical care in the area. Furthermore, it also would receive patients from smaller private hospitals that may not have the facilities for more complicated cases. We studied 5 consecutive years from 2010 to 2014 so as to ensure that the results had validity and found that the numbers were broadly similar. Thus, we would suggest that the results are representative of the hospital admissions.

In general, studies have shown that there is a low rate of starting treatment after an osteoporotic hip fracture [7–10]. A large prospective, observational cohort of women from Canada, Australia, Europe, and United States showed that only 17% started antiosteoporosis medication after an incident fracture [13]. Even within the same country, studies have shown different rates e.g., one Italian study showed treatment rates of 78% [6], but another had a treatment rate of only 33.9% [14]. Rates of treatment following low-trauma fractures in the United States have showed different results, but they have been generally lower than 30%. Kim et al. [8] found that 11% of US Medicare patients received after hip fracture treatment but a slightly higher rate of 13% from a US commercial health insurer. Gillespie and Morin [9] studying a private insurance medical and pharmacy claims database showed that only 7.2% received osteoporosis medication at 6 months after a hip fracture [9]. A study from a Pennsylvania Medicare medication database showed that between 2002 and 2004, 31% of patients received treatment after a hip fracture [15].

There have not been many studies in Asian populations. A Korean study examining their Health Insurance Review and Assessment Service database showed that 3 months after a hip fracture, 39% of patients had been prescribed antiosteoporotic medication [8]. Kung et al. [12] looked at treatment received following a low-trauma hip fracture in 6 Asian countries—mainland China and Hong Kong, Singapore, South Korea, Malaysia, Taiwan, and Thailand. Rates of treatment varied from over 60% at 6 months in South Korea and Thailand to below 20% in mainland

**Table 1**

Comparison of the proportion of patients who were treated and not treated from 2010 to 2014.

Year	Treated	Not treated	P-value
2010 (n = 60)	34 (56.7)	26 (43.3)	—
2011 (n = 58)	17 (29.3)	41 (70.7)	0.003
2012 (n = 53)	17 (32.1)	36 (67.9)	0.009
2013 (n = 44)	14 (31.8)	30 (68.2)	0.012
2014 (n = 43)	13 (30.2)	30 (69.8)	0.008

Values are presented as number (%).

\* $P < 0.05$ , statistically significant differences compared to 2010. Chi-square test.

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