Patients with Osteoporotic Hip Fractures: Factors Affecting Length of Hospital Stay (LOS) and Outcome

Manee Raksakietisak MD*,
Angkana Lurngnateetape MD*, Kongkhet Riansuwan MD**,
Ninkan Noiwan MD*, Chutimart Chaiyarak MD*,
Kittiya Keawmoon MD*, Benno von Bormann MD*

** Department of Anesthesiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*
*** Department of Orthopedics, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*

Objective: *Identify risk factors associated with prolonged hospital stay (LOS more than 14 days) in patients with osteoporotic hip fracture.*
Material and Method: *One hundred and fifty out of 356 patients with fractured femur were selected between April 2008 and August 2009. Analysis of patient's LOS (group I equal or less than 14 days, group II more than 14 days) is performed by backward binary multiple logistic regression.*
Results: *LOS in group I (n = 46) was 12.5(± 4) days compared to 21 (± 11) days in group II (n = 104). Patients were mainly female (74%) and about 50% were aged over 80 years. The 30-days mortality in group I and II was zero and two patients respectively. Time-to-surgery was three days (± 2) in group I and seven (± 5) days in group II. Significant predicting risk factors were waiting for investigation (odds ratio (OR) 3.77, confidence interval (CI) 1.12-12.69) and receiving systemic opioids (OR 3.44; CI 1.54-7.66).*
Conclusion: *Unnecessary surgery delay after hip fracture should be avoided. Higher need for opioids in those patients might be the result of prolonged waiting for surgical treatment.*

Keywords: *Hip fracture, Length of hospital stay (LOS), Time-to-surgery, Risk factors, Systemic opioids*

J Med Assoc Thai 2012; 95 (7): 917-24
Full text. e-Journal: *http://jmat.mat.or.th*

Hip fracture is one of the most common injuries in elderly[1-3]. The incidence is increasing as a consequence of an aging population[4]. Mortality in these patients is high, with a 30-day mortality of approximately 5 to 13% and 12 to 37% after one year[5-7]. Several factors such as age, operative time delay, comorbidity, mental status, anemia, and degree of independence of basic living activities are regarded as risk factors influencing the outcome of the treatment[8]. In addition, there is an increasing length of hospital stay (LOS) after surgical treatment, which may adversely affect outcome, especially in the elderly[9].

At Siriraj Hospital, a university teaching hospital in Bangkok, Thailand, an increase in LOS of patients with hip fracture undergoing surgery has been observed during the last decade, but the exact causes have not been specified. The aim of the present study was to identify risk factors for a prolonged hospital stay by these patients. With respect to the usual LOS for uncomplicated cases at Siriraj Hospital, 14 days was defined as a threshold.

Correspondence to:
Raksakietisak M, Department of Anesthesiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.
Phone: 0-2419-7990, Fax: 0-2411-3256
E-mail: manee95@hotmail.com, simrs@mahidol.ac.th

Material and Method

Three hundred and fifty one patients with hip fractures treated at Siriraj Hospital, Mahidol University, Bangkok, Thailand between April 2008 and August 2009 were enrolled. They were prospectively studied after approval by Institutional Review Board Ethics Committee. Exclusion criteria were patients being bedridden, multiple injuries, conservative treatment, revision surgery, and malignancy. Included were patients older than 65 years with osteoporotic hip fracture who were admitted during the present study period. Patients' actual anamnesis, surgical and anesthesiological technique(s), pain management, length of hospital stay (LOS), in-hospital and short-term mortality and complications (within 30 days) were recorded.

At Siriraj Hospital, these patients are normally operated on within three days after admission. During

that time, medical routine checks by surgeons and anesthesiologists are performed and informed consent obtained. Some patients, however, need specialist consultations and extra investigation, mostly bedside Echocardiogram, and extra-medications such as beta-blocker, diuretics, antibiotics, blood transfusion, and fluid and electrolyte management. The surgical procedure depends on the type of fracture. Anesthetic technique depends on anesthesiologists' discretion. Some patients are placed in special units, ICU or HDU (High Dependency Unit), after operation or to PACU (Post Anesthesia Care Unit). Standard rehabilitation program is started on ordinary ward as soon as possible with respect to the patient's condition.

Selection of predicted variables

The predicted variables are selected, based on factors that may cause prolonged hospital stay and an increase in short term (in-hospital-, 30-days-) mortality. These factors are 1) more than one comorbidity, 2) preoperative infection needing treatment, 3) age over 75 years, 4) general anesthesia, 5) difficulties in pain control (pain scores at rest more than 3, pain score on movement more than 6), 6) perioperative major complications, and 7) acute postoperative cognitive dysfunction (APOCD). Comorbidity is commonly found in aging population, and can contribute to time-consuming consultations with specialists, extra-investigation, and extra-prescription, causing delay of surgery. Preoperative infection is defined as fever, leukocytosis, and infection of particular organs system (lung, kidney etc.). Post-operative major complications are defined as blood loss > 1/2 of patient's blood volume, thromboembolism, major wound infection or sepsis, cardiovascular complications such as acute coronary syndrome, congestive heart failure, significant arrhythmias, respiratory complications such as pneumonia or exacerbation of chronic obstructive pulmonary diseases (COPD), and unexplained hypoxemia. There is an increasing concern about APOCD and its adverse influence on outcome in the elderly[10]. The authors compared patient's cognitive function by recording nurses and physicians' opinions as well as a simple questioning of patient's relatives comparing the postoperative vs. preoperative situation (similar, worse, better).

Study design and statistical analysis

Cross sectional study design is carried out and SPSS 13.0 for Windows is used for statistical analysis. Differences between groups (group I, LOS equal or less than 14 days, group II, LOS more than 14 days) are investigated for statistical significance using Chi-square test for categorical variables and the student t test or Mann-Whitney U test for continuous variables when appropriate. $P < 0.05$ is considered as having statistical significance. Backward binary multiple logistic regression analysis is performed to identify predictable risk factors. One hundred fifty patients are deemed to be a sufficient number to match the purpose and the criteria of the present study.

Results

Data of 351 consecutive patients with fracture of the femur were initially obtained. Two hundred one patients were excluded due to exclusion criteria (Fig. 1). Of the remaining 150 patients, 46 had a hospital stay (LOS) equal or less than 14 days (12.5 ± 4 days for GROUP I) compared to 104 patients with LOS more than 14 days (22 ± 11 days for GROUP II). The LOS of the two groups was significantly different.

Relevant preoperative data are demonstrated in Table 1. There were more female patients, and no significant differences between the groups with the mean age of 77.5 and 78.2 years, respectively. More than 40% of the patients in both groups were older than 80 years. The average time-to-surgery (admission to OR) was three days in group I (45.7% with > 3 days) and seven days in group II (83.3% with > 3 days) ($p < 0.001$). The surgical delay was mainly caused by the need for additional investigation and management (echocardiogram, change of prescription) due to patient's health condition. There were statistically significant differences between the two groups in ASA status, comorbidity, need for special investigation and extra-prescription, and pre-operative infections, with group II having a majority of patients restricted in terms of health condition. There was no difference in preoperative hematocrit.

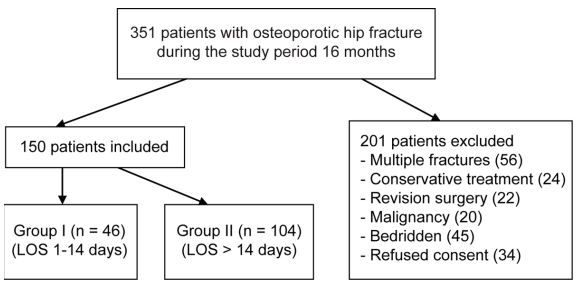

Fig. 1 Flow about patient selection

Intraoperative and postoperative data are summarized in Table 2 and 3. There were no significant differences between the groups with respect to anesthetic and surgical procedure, though six patients of group II had additional regional block with general anesthesia. Planned operations had to be postponed in

Table 1. Preoperative characteristics of patients with hip fracture

	Group I (n = 46) LOS ≤ 14 days	Group II (n = 104) LOS > 14 days	p-value
Female (n, %)	30 (65.2)	81 (77.9)	n.s.
Age (mean, SD)	77.5 (8.7)	78.2 (9.0)	n.s.
> 80 years (n, %)	19 (41.3)	49 (47.1)	
ASA (I/II/III/IV)(n)	0/23/23/0	0/27/76/1	0.004
ASA ≥ 3 (n, %)	23 (50.0)	77 (74.0)	
Fracture site (n)			
Neck, intertrochanteric	25/21	55/49	n.s.
Admission to OR (mean, IQR)	3 (2)	7 (5)	<0.001
Admission to OR > 3 days (n, %)	21 (45.7)	85 (83.3)	
Co-morbidities and consultations ≥ 2 (n, %)	27 (58.7)	87 (83.7)	0.002
Special investigations (n, %)	4 (8.7)	34 (32.7)	0.002
Extra-medications (n, %)	17 (37.0)	64 (61.5)	0.009
Infections (n, %)	1 (2.2)	20 (19.2)	0.004
Hct (g/dl) (mean, SD)	32.0 (4.7)	32.7 (4.6)	n.s.
Hct < 30 g/dl (n, %)	16 (34.8)	29 (27.9)	n.s.

OR = operating room; n.s. = non significant

Table 2. Intraoperative data of patients with hip surgery

	Group I (n = 46) LOS ≤ 14 days	Group II (n = 104) LOS > 14 days	p-value
Anesthesia (n, %)			
RA (+ PNB)	39 (84.8)	75 (71.8)	
GA (+ PNB)	7 (15.2)	23 (22.3)	n.s.
GA + RA	0	6 (5.8)	
Unplanned postponement of surgery (n, %)	2 (4.3)	24 (23.1)	0.004
Surgery			
Dynamic hip screw	14 (30.4)	21 (20.2)	n.s.
Hemiarthroplasty	21 (45.7)	51 (49.0)	
Nailing or others	11 (23.9)	32 (30.8)	
EBL (ml) (mean, SD)	251 (278)	226 (183)	n.s.
Intraoperative events (n, %)	28 (60.8)	50 (48.0)	
Hypotension	13 (28.2)	35 (33.6)	
Oliguria	3 (6.5)	12 (11.5)	n.s.
Hypotension & oliguria	2 (4.3)	2 (1.9)	
Others	0	5 (4.8)	

GA = general anesthesia; PNB = peripheral (femoral) nerve block; RA = regional anesthesia; EBL = estimated blood loss; n.s. = non significant

Table 3. Postoperative data of patients with hip surgery

	Group I (n = 46) LOS ≤ 14 days	Group II (n = 104) LOS > 14 days	p-value
Total hospital stay (days; mean/SD)	12.5 (4)	22 (11)	<0.001
In hospital or 30 days death (n, %)	0	2 (1.9%)	n.s.
Special postoperative care (n, %)	10 (21.7)	50 (48.1)	0.002
LOS (median, IQR)	1 (0)	1 (0)	
Analgesics received in 24 hr (n, %)			
Intrathecal morphine (n,%)	24 (52.2)	43 (41.3)	n.s.
Femoral nerve block	25 (54.3)	57 (54.8)	n.s.
Systemic opioids	18 (39.1)	70 (67.3)	0.002
Pain scores (n, %)			
At rest > 3	6 (14.6)	11 (12.8)	n.s.
On movement > 6	14 (34.1)	29 (33.3)	n.s.
Transfusion PRC (first 24 hours)			
Unit (median/IQR)	0 (1)	1 (1)	0.010
Patients (n, %)	13 (28.3)	55 (52.9)	0.009
Major complications (n, %)			
Infection/sepsis	6 (13.0)	14 (13.5)	n.s.
CVS	3 (6.5)	5 (4.8)	n.s.
RS	3 (6.5)	10 (9.6)	n.s.
Others	2 (11.1)	5 (10.0)	n.s.
Acute postoperative cognitive dysfunction (APOCD)	8 (17.4)	24 (23.1)	n.s.
Starting out of bed ambulation (mean (SD))	4.8 (2.4)	6.9 (3.3)	<0.001
> 7 days (n,%)	8 (17.4)	39 (37.5)	0.024
Activity at one month compared with previous activity (n, %)			
Same activity	22 (47.8)	31 (29.8)	0.040
More activity	3 (6.5)	9 (8.7)	n.s.
Less activity	21 (45.7)	64 (61.5)	n.s.

CVS: acute coronary syndrome, congestive heart failure, significant arrhythmias; RS: pneumonia, exacerbation of COPD, unexplained hypoxemia; Others: acute renal failure, severe hyponatremia, gastrointestinal bleeding

23% of the patients in group II, compared to 4.3% in group I (p = 0.004). The reasons were unexpected complications (most of which were acute infections) and technical problems such as no staff, no theatre, or no beds for special postoperative care (ICU or HDU). Blood loss was similar within the groups and most patients did not receive any blood intraoperatively. However, group II patients received more blood, compared to group I (p = 0.015) intraoperatively as well as postoperatively. Intraoperative complications such as hypotension, oliguria or others were similar in both groups (Table 2). Nearly half of group II patients were placed in special post-operative care units, compared to about 22% in group I (p = 0.002), but the average stay was only one day. There were no differences in pain scores at rest or on movement between the two groups, but group II needed more systemic opioids for achievement of that effect (p = 0.002). In both groups, the incidence of post-operative cognitive dysfunction, as compared to the preoperative situation, was similar (17.4% group I vs. 23.1% group II; p = 0.57). About 30% of the patients suffered from major postoperative complications such as infection, cardiopulmonary dysfunction, or renal failure and metabolic problems with no significant differences between the two groups. Two deaths (within

Table 4. Independent single risk factors for prolonged hospital stay (LOS) in patients with hip fractures from backward binary regression analysis

Risk factors	p-value	Odds ratio	95% confident interval
Special investigation	0.032	3.77	1.12-12.69
Receiving systemic opioids	0.002	3.44	1.54-7.66

30 days) occurred in group II. One patient died due to bowel perforation, peritonitis and sepsis. The other patient had sudden cardiac arrest at home after being discharged.

Less than half of the patients' physical and mental capacity was comparable to preoperative status with better results in group I patients (Table 3). Statistical method to investigate what factors did contribute to prolonged hospital stay (LOS) included univariate analysis and backward binary regression analysis. Independent factors contributing to prolonged LOS were delay of surgery due to the need for special investigation (OR 3.77, confidence interval (CI) 1.12-12.69), and increased systemic opioids consumption (OR 3.44; CI 1.54-7.66) (Table 4).

Discussion

In general, the data show that patients' LOS strongly depends on their physical and mental condition, which is not surprising and in accordance with literature[3,6,11,12]. Independent risk factors for prolonged hospital stay were 1) delay of surgery, caused by waiting for special investigation (OR 3.77, CI 1.12-12.69); 2) elevated requirement of systemic opioids after surgery (OR 3.44, CI 1.54-7.66). The greater need for special investigation, was correlated to patient's health condition, as demonstrated in more comorbidity. Of course, the special investigation itself did not lead to prolonged LOS, but rather the consecutive surgical delay.

The influence of the interval between admission of a patient with hip fracture and surgical treatment is a matter of great concern. From a national survey in UK, 20% of the anesthetists insisted upon pre-operative echocardiogram in a previously undiagnosed heart murmur, and 53% of whom would request echocardiogram if the patients had suspicious signs or symptoms[13]. In Siriraj Hospital, orthopedic surgeons usually consult internists for evaluation of pre-operative risk. If the consulted doctors estimate echocardiogram would have some benefits, it will sometimes lead to a delay of a couple of days. As a result, group II patients had a time-to-surgery of seven days (mean) compared to three days (mean) in group I. Both time spans, three or seven days, are considered too long in the current literature. Verbee et al[14] reported a trend of fewer complications and shorter LOS after early surgery (within one day after admission) in hip fracture patients. Radcliff et al[4] analyzing the data of 5,683 male veterans with hip fracture, found a strong influence of ASA status, but also of surgical delay on outcome. The authors suggested an operation within four days after admission in order to improve survival rate. The Canadian study of Weller et al[9] included 57,315 patients with surgery for hip fracture. They found a strong relationship between delay to surgery (> one day) and mortality, especially in patients younger than 70 years old with no relevant comorbidity, leading to the authors' suggestion to avoid any delay of surgery for non-medical reasons. There are other studies, however, reaching different conclusions. Smektala et al[15] did not find any influence of surgical delay (> 36 h) on mortality after hip fracture, but shorter time-to-surgery led to less postoperative complications such as decubitus ulcers, prolonged pain, cardiovascular events, and pneumonia. The results of the prospective cohort study of Orosz et al[16] are similar. There was no influence of early surgery on functional status or mortality, but surgery within 24 hours was associated with less pain, shorter LOS and reduced major complications. Grimes et al[17] studying 8,383 consecutive hip fracture patients retrospectively did not see any influence of surgical timing on mortality or secondary outcome parameters.

The seemingly conflicting results may be explained by different study designs; for example, consecutive patients as in the paper of Foss and Kehlet[18] with a 30-days mortality of 13.3%, compared to selected patients as in the present study at 1.3% of 30-days mortality. Excluding high-risk patients, the authors reduced the initial number of 351 patients to 150. Another crucial point may be the question whether all patients would benefit from early surgery and, not less important, if shortened LOS is desirable for all patients. One has to distinguish between surgical

delay due to medical reasons and delay due to poor management. Weller et al[9] clearly demonstrated a correlation between surgical delay and mortality in younger hip fracture patients with no significant co-morbidity. This was less pronounced in older patients with high co-morbidity, suggesting that a negative effect of surgical delay on outcome may be especially related to patients with non-medical reasons for the delay. In contrast, old patients with ASA III or worse may benefit from reasonable preparation to surgery, considering prolonged time-to-surgery. Holt et al[19] reporting 4,284 patients from the Scottish Hip Fracture Audit, found out that treating relevant co-morbidity before surgery, though resulting in surgical delay, led to an improvement of survival, whereas similar patients being operated immediately had a lower survival rate. In the present study, patients with special investigation leading to prolonged time-to-surgery had a LOS of 22 days compared to 12.5 days for patients with earlier surgery. However, the influence of surgical delay on LOS remains questionable. Patients with LOS > 14 days were worse in ASA status, had more extra investigation including need for change of prescription, and more preoperative infections compared to patients with LOS < 14 days, thus leading to prolonged recovery as stated by Mak et al[10]. Within the debate about time-to-surgery and LOS and its relevance on outcome parameters, it is within reason to speculate that prolonged LOS can be beneficial in special cases. In a retrospective observational study, Kondo et al[20] compared hip surgery patients with discharge after 30 to 39 days to those with discharge after 40 days or more, finding a better long-term outcome for the latter group. The authors suggested that patients with hip surgery should not be discharged before complete recovery from surgery. This emphasizes the importance of a working rehabilitation program taking care of the patients until complete recovery. In conclusion, time-to-surgery and LOS are not independent criteria for good treatment. It was well documented by Beaupre and coworkers[8], that an evidence-based management pathway in hip fracture patients could reduce postoperative morbidity without increasing costs for the healthcare system.

The second independent risk factor for prolonged LOS in the present study was an elevated postoperative requirement for systemic opioids. As neither postoperative pain scores at rest and with movement (Table 3) nor analgesic regimen were significantly different between the groups (in both groups, half of the patients received intrathecal morphine and the other half had femoral nerve block), the need for efficient pain treatment in group II patients (prolonged LOS and time-to-surgery) was obviously higher. Does that mean that systemic opioids and their side effects increase hospital stay? Indeed, several patients experienced nausea and vomiting (PONV), but with no significant differences between the groups. Though the need for pain control is procedure specific[21], the authors routinely prescribe the same analgesics for hip surgery patients. In the present study, the two groups were comparable in surgical techniques. On the other hand, time-to-surgery in group II patients was seven days compared to three days in group I. There is obviously a correlation between surgical delay and postoperative pain[16], so that operative delay changes and transforms the pain pathway as described by Rogmark et al for this kind of patient[22]. Patients with chronic pain might be unable to ambulate early, leading to prolonged hospital stay. The authors believe the present results demonstrate the influence of surgical delay on postoperative pain rather than the influence of opioid consumption on LOS.

Minor and major postoperative complications occurred in both groups but were unlikely to be responsible for prolonged hospital stay. Acute postoperative cognitive dysfunction (APOCD), although found in one-fifth of the patients, did not increase LOS. On the other hand, the authors' method for assessment of that parameter was poor, as only physicians and relatives' opinions came into consideration without using one of the established scores like Functional Independence Measure (FIM)[23].

The present study has some limitations as more than 50% of the patients were excluded (Fig. 1), thus not comparable with studies investigating consecutive patients. As a factor that might contribute to prolonged hospital stay and mortality, renal dysfunction[24] was not included in the present study. Many patients in both groups had elevated creatinine level upon admission, but the authors did not follow the parameter continuously. On the other hand, no relevant renal failure occurred during the 30-day postoperative period.

Conclusion

The authors believe the presented data demonstrate that surgical delay led to prolonged LOS and elevation of postoperative opioid consumption. Though data about the influence of time-to-surgery on outcome (mortality) are conflicting, we believe that

the average time-to-surgery in Siriraj Hospital for patients with hip fracture is too long. This is particularly true as most delays happen for non-medical reasons, such as waiting for special investigation. Consequently, the authors need to establish a system that provides early surgery for patients with no comorbidity as well as a proven pathway for those needing special preparation prior to surgery.

Acknowledgements

The present study received financial support from the Faculty of Medicine Siriraj Hospital, Mahidol University.

Potential conflicts of interest

None.

References

1. Diamond TH, Thornley SW, Sekel R, Smerdely P. Hip fracture in elderly men: prognostic factors and outcomes. Med J Aust 1997; 167: 412-5.
2. Lofgren S, Ljunggren G, Brommels M. No ticking time bomb: hospital utilisation of 28,528 hip fracture patients in Stockholm during 1998-2007. Scand J Public Health 2010; 38: 418-25.
3. Nieuwenhuijzen Kruseman AC, Pijpers E. Proximal femur fractures in the elderly in The Netherlands during the period 1991-2004: incidence, mortality, length of hospital stay and an estimate of the care capacity needed in the future. Ned Tijdschr Geneeskd 2007; 151: 619.
4. Radcliff TA, Henderson WG, Stoner TJ, Khuri SF, Dohm M, Hutt E. Patient risk factors, operative care, and outcomes among older community-dwelling male veterans with hip fracture. J Bone Joint Surg Am 2008; 90: 34-42.
5. Foss NB, Kristensen MT, Kehlet H. Prediction of postoperative morbidity, mortality and rehabilitation in hip fracture patients: the cumulated ambulation score. Clin Rehabil 2006; 20: 701-8.
6. Holt G, Smith R, Duncan K, Hutchison JD, Gregori A. Epidemiology and outcome after hip fracture in the under 65s-evidence from the Scottish Hip Fracture Audit. Injury 2008; 39: 1175-81.
7. McLeod K, Brodie MP, Fahey PP, Gray RA. Long-term survival of surgically treated hip fracture in an Australian regional hospital. Anaesth Intensive Care 2005; 33: 749-55.
8. Beaupre LA, Cinats JG, Senthilselvan A, Lier D, Jones CA, Scharfenberger A, et al. Reduced morbidity for elderly patients with a hip fracture after implementation of a perioperative evidence-based clinical pathway. Qual Saf Health Care 2006; 15: 375-9.
9. Weller I, Wai EK, Jaglal S, Kreder HJ. The effect of hospital type and surgical delay on mortality after surgery for hip fracture. J Bone Joint Surg Br 2005; 87: 361-6.
10. Mak JC, Cameron ID, March LM. Evidence-based guidelines for the management of hip fractures in older persons: an update. Med J Aust 2010; 192: 37-41.
11. Gholve PA, Kosygan KP, Sturdee SW, Faraj AA. Multidisciplinary integrated care pathway for fractured neck of femur. A prospective trial with improved outcome. Injury 2005; 36: 93-8.
12. Bhandari M, Koo H, Saunders L, Shaughnessy SG, Dunlop RB, Schemitsch EH. Predictors of in-hospital mortality following operative management of hip fractures. Int J Surg Investig 1999; 1: 319-26.
13. Sandby-Thomas M, Sullivan G, Hall JE. A national survey into the peri-operative anaesthetic management of patients presenting for surgical correction of a fractured neck of femur. Anaesthesia 2008; 63: 250-8.
14. Verbeek DO, Ponsen KJ, Goslings JC, Heetveld MJ. Effect of surgical delay on outcome in hip fracture patients: a retrospective multivariate analysis of 192 patients. Int Orthop 2008; 32: 13-8.
15. Smektala R, Endres HG, Dasch B, Maier C, Trampisch HJ, Bonnaire F, et al. The effect of time-to-surgery on outcome in elderly patients with proximal femoral fractures. BMC Musculoskelet Disord 2008; 9: 171.
16. Orosz GM, Magaziner J, Hannan EL, Morrison RS, Koval K, Gilbert M, et al. Association of timing of surgery for hip fracture and patient outcomes. JAMA 2004; 291: 1738-43.
17. Grimes JP, Gregory PM, Noveck H, Butler MS, Carson JL. The effects of time-to-surgery on mortality and morbidity in patients following hip fracture. Am J Med 2002; 112: 702-9.
18. Foss NB, Kehlet H. Mortality analysis in hip fracture patients: implications for design of future outcome trials. Br J Anaesth 2005; 94: 24-9.
19. Holt G, Smith R, Duncan K, McKeown DW. Does delay to theatre for medical reasons affect the peri-operative mortality in patients with a fracture of the hip? J Bone Joint Surg Br 2010; 92: 835-41.

20. Kondo A, Zierler BK, Hagino H. Relationship between the length of hospital stay after hip fracture surgery and ambulatory ability or mortality after discharge in Japan. Jpn J Nurs Sci 2010; 7: 96-107.
21. Foss NB, Kristensen MT, Palm H, Kehlet H. Postoperative pain after hip fracture is procedure specific. Br J Anaesth 2009; 102: 111-6.
22. Rogmark C, Flensburg L, Fredin H. Undisplaced femoral neck fractures—no problems? A consecutive study of 224 patients treated with internal fixation. Injury 2009; 40: 274-6.
23. Lenze EJ, Munin MC, Dew MA, Marin RS, Butters MA, Skidmore ER, et al. Apathy after hip fracture: a potential target for intervention to improve functional outcomes. J Neuropsychiatry Clin Neurosci 2009; 21: 271-8.
24. Bennet SJ, Berry OM, Goddard J, Keating JF. Acute renal dysfunction following hip fracture. Injury 2010; 41: 335-8.

ผู้ป่วยกระดูกสะโพกหัก: ปัจจัยที่มีผลต่อระยะเวลาการอยู่โรงพยาบาลและผลลัพธ์

มานี รักษาเกียรติศักดิ์, อังคณา เหลืองนทีเทพ, ก้องเขต เหรียญสุวรรณ, นิลคำ น้อยวัน, ชุติมาศ ไชยรักษ์, กิติยา แก้วมูล, เบนโน วอน โบว์แมน

วัตถุประสงค์: *ระยะเวลาของการอยู่โรงพยาบาลของผู้ป่วยที่มีกระดูกสะโพกหักขึ้นอยู่กับหลายปัจจัยซึ่งอาจจะเกี่ยวข้องกับสภาพของผู้ป่วยที่สูงอายุและมีโรคร่วมหลายชนิด การศึกษานี้ต้องการหาปัจจัยเสี่ยงที่ทำให้ผู้ป่วยโรงพยาบาลศิริราชที่กระดูกสะโพกหักต้องอยู่โรงพยาบาลนานกว่า 14 วัน*

วัสดุและวิธีการ: *ผู้ป่วย 150 คนจาก 351 คนที่มารับการผ่าตัดในโรงพยาบาลศิริราชตั้งแต่เดือนเมษายน พ.ศ. 2551 ถึงสิงหาคม พ.ศ. 2552 นำมาวิเคราะห์หาปัจจัยเสี่ยง โดยใช้วิธีการทางสถิติ การวิเคราะห์ข้อมูลโดยการแบ่งผู้ป่วยเป็น 2 กลุ่ม โดยที่กลุ่ม 1 อยู่โรงพยาบาลน้อยกว่าหรือเท่ากับ 14 วัน กับกลุ่ม 2 อยู่โรงพยาบาลมากกว่า 14 วัน*

ผลการศึกษา: *กลุ่มที่ 1 (46 คน) มีค่าเฉลี่ยของระยะเวลาการอยู่โรงพยาบาล 12.5 วัน ขณะที่กลุ่มที่ 2 (104 คน) 21 วัน ร้อยละ 74 เป็นเพศหญิงและประมาณครึ่งหนึ่งมีอายุมากกว่า 80 ปี มีผู้ป่วยในกลุ่มที่ 1 และ 2 จำนวน 0 และ 2 รายตามลำดับ ที่ตายภายใน 30 วันหลังการผ่าตัด ระยะเวลาก่อนผ่าตัด (ตั้งแต่อยู่โรงพยาบาลจนได้รับการผ่าตัด) ในผู้ป่วยในกลุ่มที่ 1 และ 2 คือ 3 และ 7 วันตามลำดับ ปัจจัยเสี่ยงของการอยู่โรงพยาบาลนานกว่า 14 วัน คือ การรอตรวจพิเศษเพิ่มเติม (โดยเฉพาะการตรวจทางหัวใจ) (OR 3.77, CI 1.12-12.69) และการได้รับยาแก้ปวดกลุ่ม opioids หลังการผ่าตัด (OR 3.44; CI 1.54-7.66)*

สรุป: *ควรหลีกเลี่ยงใช้เวลานานในการเตรียมผู้ป่วยก่อนการผ่าตัด การใช้ยาแก้ปวดที่เพิ่มในกลุ่มที่ 2 อาจมีผลจากการรอผ่าตัดที่นานเกินไป*