The Mortality Rate after Thromboembolism Prophylaxis in the Hip Fracture Surgery

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Background: *Although hip fracture surgery treatments have been improved, the mortality rate remains high because of a high risk of complications, such as myocardial infarction and venous thromboembolism. Many studies have identified the benefit of thromboembolism prophylaxis.*
Objective: *To determine the 1-year mortality rate of thromboembolism prophylaxis and non-prophylaxis after the hip fracture surgery.*
Material and Method: *This study is a prospective analytic study. 114 patients who had undergone the hip fracture surgery between 2004-05 were given follow-up examinations every 3 months for 1 year.*
Results: *Of the 114 patients, 25 patients (21.9%) have received the medical thromboprophylactic protocol and 89 patients (78.1%) have not. The 1-year mortality rate was 12.0% (3 cases) and 9.0% (8 cases) in the thromboprophylactic group and nonprophylactic group, respectively (p = 0.704). The mean age was significantly older in the deceased group (86.4 year old, SD 12.86) than the non-deceased group (78.0 years old, SD 8.04) (p = 0.003). The median duration from postoperation to death was 19 weeks after the surgery (range 0.5- 52 weeks). The causes of death were acute myocardial infarction 3 (27.3%), sepsis 2 (18.2%), aspiration pneumonia 1 (9.1%), and unknown cause 5 (45.4%).*
Conclusion: *The overall 1 year mortality rate after surgery of the hip fracture is 9.6% and it is not different regardless of whether the medical thromboembolism prophylaxis has been established or not. Myocardial infarction was the most common cause (27.3%). The elderly patient is at a higher risk of mortality in 1 year after the surgery.*

Keywords: *Mortality rate, Thromboprophylacxis, Hip fracture*

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It has been known that as life expectancy increases, a hip fracture becomes a major problem in the elderly. The incidence of hip fracture in the Thai population has been reported as 185.2 per 1000[1]. One of the concerns with this problem has been shown by many reports that have demonstrated a high mortality rate ranging from 14 to 47% in the first year after the hip fracture[2-7]. The most common causes of death after the hip fracture are cardiovascular and respiratory disease[8] while pulmonary embolism, malignancy, sepsis, and renal failure have been reported as well[9,10]. The ESCORTE (Evenements cliniques dans les Suites d'une intervention Chirurgicale Orthope dique a' Risque Thrombotique Eleve) study has reported that 3.9%[8] of mortality cases were due to pulmonary embolism compared to 19.4% in some studies[9]. Corresponding to our previous study that showed a high incidence of deep vein thrombosis after hip surgery, we found 47.9% of deep vein thrombosis by venography[11].

Our objective is to determine the mortality rate of thromboembolism prophylaxis and non-prophylaxis after the hip fracture surgery.

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Material and Method

Between 2004 and 2005, the patients over 60 years of age at the Department of Orthopaedics,

Phramongkutklao Hospital who underwent a surgery for an intertrochanteric fracture or fracture neck of the femur were asked to participate in the study. Patients were excluded if they had had a pathologic fracture, multiple fracture, previously received thromboprophylactic drugs or contraindicative for thromboprophylactic drugs. The investigation was approved by the ethics committee on human research.

All the patients have received a deep vein thrombosis prophylaxis with the same rehabilitation protocol and pneumatic devices. The patients taken care of by the service under supervision of the senior author (TC) will undergo an additional medical venous thromboembolism prophylactic protocol. The protocol consists of injecting a low molecular weight heparin (Enoxaparin sodium) 40 mg subcutaneously 12 to 24 hours after the surgery, once a day, for 5 consecutive days. A Coumadin 3 mg is started at the same day of LMWH, taken once a day and continued for 10 days. Patients taken care of by the others service will not receive the medical venous thromboembolism prophylactic protocol.

The patients were given followed-up examination every 3 months for 1 year, and some patients were also interviewed by telephone or letter. The Chi-square test was used for the qualitative data, the Student t-test was used for a quantitative data with a normal distribution and the Mann-Whitney U-test was used for a non-parametric data. The SPSS version 13.0 was used for the statistic analysis.

Results

Of the 114 patients included in the study, 25 patients had undergone the thromboprophylactic protocol compared to 89 patients who had not. The mean age of the study group was 78.8 years old; there were 89 females (78%) and 25 males (22%). 62 patients had a fracture neck of the femur (54.3%) and 52 had an intertrochanteric fracture (45.7%). Of the 114 patients, 75 patients (66%) have had an associated disease. The patients who underwent unipolar hemiarthroplasty, bipolar hemiarthroplasty, and dynamic hip screw fixation was 44 (38.6%), 25 (21.9%) and 38 (33.4%) respectively. The demographic data is shown in Table 1

Table 1. Demographic and clinical characteristics of the patients

	All cases (n = 114)	Prophylactic group (n = 25)	Non-prophylactic group (n = 89)
Age (years)			
Mean (SD)	78.8 (8.9)	80.6 (8.37)	78.3 (9.02)
Sex			
Female : Male	89 : 25	19 : 6	70 : 19
Anesthesia			
RA : GA	104 : 10	25 : 0	79 : 10
Fracture			
Neck : IT	62 : 52	17 : 8	45 : 44
Type of Surgery: n (%)			
DHS fixation	38 (33.4)	9 (36.0)	29 (32.6)
Unipolar hemiarthroplasty	44 (38.6)	10 (40.0)	34 (38.2)
Bipolar hemiarthroplasty	25 (21.9)	6 (24.0)	19 (21.3)
Others	7 (6.1)	0 (0.0)	7 (7.9)
Blood loss (mL)			
< 300	101	24	77
300-600	12	1	11
> 600	1	0	1
Associated disease: n (%)			
Yes	75 (66.0)	14 (56.0)	61 (69.0)
None	39 (34.0)	11 (44.0)	28 (31.0)
Status: n (%)			
Deceased	11 (9.6)	3 (12.0)	8 (9.0)
Non-deceased	103 (90.4)	22 (88.0)	81 (91.0)

RA = regional anesthesia, GA = general anesthesia, IT = intertrochanteric fracture

and there was no statistically difference between the groups.

Eleven patients (9.6%) in the study group deceased in the first year after the surgery. There were 3 of 25 patients (12.0%) in the thrombophophylactic group compared to 8 of 89 patients (9.0%) in the non-prophylactic group, which was not statistically significant (p = 0.704), Table 2. The most common cause of death was myocardial infarction as shown in Fig. 1.

The median time to decease was 19 weeks after the surgery (range 0.5-52 weeks). One out of three patients (33.3%) in the thromboprophylactic group and 4 out of 8 patients (50%) in the non-prophylactic group deceased within 12 weeks after the surgery. Within a 5 month period after the surgery, there was one deceased patient (33.3%) in the thromboprophylactic group compared to 6 (75%) in the non-prophylactic group as shown in Table 3.

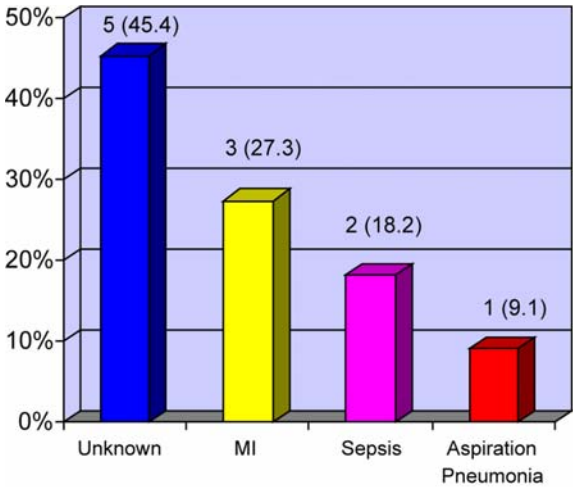

Fig. 1 The cause of death of the patients who underwent the surgery for the hip fracture between 2004-2005 at Phramongkutklao Hospital
* MI = myocardial infarction

Discussion

Studies of mortality among elderly hip fracture patients in North America have reported a high rate of 18-33%[12,13]. The mortality rate in Europe and Japan has been reported as 25[14] and 12.7%[15], respectively. Our incidence is 9.6%, which is lower than previous reports, and may be because the pathologic fracture patients were excluded.

The mortality rate between the prophylactic and non-prophylactic groups is not statistically different but might be due to the small sample size. This result is contrary to the studies[16,17] that demonstrated a benefit of thromboprophylaxis in reducing the mortality after the hip fracture. There were 5 patients in our study who deceased with unknown cause but 4 patients had not undergone the medical thromboprophylactic protocol. Because an autopsy has not been done for the cases, it could not be confirmed if the LMWH provides a benefit in the situation. Another finding in our study is that the deceased patients seem to occur earlier in the non-prophylactic group, 50% within 12 weeks and 75% within 5 months after the surgery, compared to 33.3% of the prophylactic group.

The mean age of deceased patients in 1 year after the surgery was 86.4, significantly older than 78.0 in the remaining patients, p = 0.003[2-4,6,18]. The underlying disease, type of anesthesia, and type of surgery was not significant different between groups, this result being similar to the report by Modig[19]. However, the study by White[6] identified that elderly, intertrochanteric fracture, premorbid status, and more than 24 hours surgical delay after the fracture are the

Table 2. The mortality rate of both groups

	Prophylactic group (n = 25)	Nonprophylactic group (n = 89)
Deceased group: n (%)	3 (12.0)	8 (9.0)
Non-deceased: n (%)	22 (88.0)	81 (91.0)

Table 3. Details of prophylaxis received, period until death, and cause of death of the deceased patients

Case No.	Thrombo-prophylaxis	Period after surgery until deceased (weeks)	Cause of death
1	Yes	2	Aspiration pneumonia
2	Yes	28	Unknown
3	Yes	52	MI
4	No	0.5	MI
5	No	3	Sepsis
6	No	9	MI
7	No	12	Unknown
8	No	19	Unknown
9	No	21	Unknown
10	No	29	Unknown
11	No	31	Sepsis

* MI = myocardial infarction

risk factors for increasing the mortality rate from 15 to 30%.

Conclusion

In conclusion, the overall 1 year mortality rate after surgery of the hip fracture is 9.6% and it is not different whether the medical thromboembolism prophylaxis has been established. The elderly patient is at a higher risk of mortality in 1 year after the surgery.

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อัตราการเสียชีวิตภายหลังการผ่าตัดกระดูกข้อสะโพกหักร่วมกับได้รับยาป้องกันการแข็งตัวของเลือด

ธไนนิธย์ โชตนภูติ, เอกชัย เจริญอาภรณ์วัฒนา, อาทิตย์ เหล่าเรืองธนา

ภูมิหลัง: *เป็นที่ทราบกันโดยทั่วไปว่าอัตราการตายหลังจากเกิดกระดูกสะโพกหักในผู้ป่วยสูงอายุนั้นมีอัตราค่อนข้างสูง สาเหตุของการเสียชีวิตอาจจะมาจากกล้ามเนื้อหัวใจขาดเลือดหรือหลอดเลือดดำอุดตัน*

วัตถุประสงค์: *เพื่อศึกษาหาอัตราการตายภายหลังการผ่าตัดกระดูกข้อสะโพกหัก ในกลุ่มซึ่งได้รับยาป้องกันการแข็งตัวของเลือด และไม่ได้รับยา*

วัสดุและวิธีการ: *ในการศึกษานี้จึงทดลองให้ยาป้องกันการแข็งตัวของเลือด ภายหลังการผ่าตัดรักษาภาวะกระดูกสะโพกหักในผู้ป่วยสูงอายุ จากจำนวนผู้ป่วยทั้งหมด 114 รายที่เข้ารับการผ่าตัด มีผู้ป่วยจำนวน 25 ราย (21.9%) ที่ได้รับยาป้องกันการแข็งตัวของเลือด เปรียบเทียบกับผู้ป่วยจำนวน 89 ราย (78.1%) ที่ไม่ได้รับยาดังกล่าว ติดตามผลการรักษาทุก 3 เดือน จนครบ 1 ปี*

ผลการศึกษา: *จากการศึกษาพบว่าอัตราการเสียชีวิตที่ 1 ปีของกลุ่มผู้ป่วยที่ได้รับยาเท่ากับ 12.0% (3 ราย) เทียบกับ 9.0% (8 ราย) ในกลุ่มที่ไม่ได้รับยา ซึ่งไม่มีนัยสำคัญทางสถิติ (p = 0.704) พบว่าอายุเฉลี่ยของกลุ่มผู้ป่วยที่เสียชีวิตเท่ากับ 86.4 ปี สูงกว่าอายุเฉลี่ยของกลุ่มที่ยังมีชีวิตอยู่ (78.0 ปี) อย่างมีนัยสำคัญ (p = 0.003) สาเหตุของการเสียชีวิต 45.4% ไม่ทราบสาเหตุ, 27.3% จากกล้ามเนื้อหัวใจขาดเลือด, 18.2% จากการติดเชื้อในกระแสโลหิตและ 9.1% จากภาวะปอดอักเสบ*

สรุป: *อัตราการตายในทั้งสองกลุ่มผู้ป่วยไม่แตกต่างกัน*