ISSN 2091-2889 (Online)
ISSN 2091-2412 (Print)

Journal of Chitwan Medical College 2018;8(24):10-15
Available online at: www.jcmc.cmc.edu.np

ORIGINAL RESEARCH ARTICLE

INCIDENCE OF DEEP VEIN THROMBOSIS FOLLOWING HIP FRACTURE SURGERY AT TRIBHUVAN UNIVERSITY TEACHING HOSPITAL

Bishnu Pokharel[1], Sharma Poudel[2], Lakhan Lal Shah[3]

[1]Department of Orthopaedics, B. P. Koirala Institute of Health Sciences, Dharan, Nepal.
[2]Department of Radiology, Tribhuvan University Teaching Hospital, Kathmandu, Nepal.
[3]Department of Orthopaedics, Tribhuvan University Teaching Hospital, Kathmandu, Nepal.

***Correspondence to:** Bishnu Pokharel, Department of Orthopaedics, B. P. Koirala Institute of Health Sciences, Dharan, Nepal.*
Email: bishnu.pokharel@bpkihs.edu

ABSTRACT

Introduction: The incidence of venous thromboembolism (VTE) in Western population undergoing major orthopaedic surgery without any thromboprophylaxis has been reported to range from 32% to 88%. Recent studies done in Asian population however show variable results ranging from 5% to 50%. No study has yet been done to determine incidence of deep vein thrombosis (DVT) in Nepalese population. The objective of our study was to determine the incidence of DVT following hip fracture surgery. Methods: This was a prospective descriptive study of 66 patients of 40 years and above who had undergone hip fracture surgery admitted under the Department of Orthopaedics and Trauma Surgery, TUTH, Kathmandu, Nepal. Following hip fracture surgery, screening for the evidence of DVT was done on 5th postoperative day with Doppler ultrasonography of bilateral lower limbs. Results: The incidence of deep vein thrombosis in our study was 8% (5 of 66 patients) in the fractured limb. Three of them were distal DVT and 2 were proximal. None of the patients developed DVT in the unaffected limb. Conclusion: The incidence of deep vein thrombosis following hip fracture surgery is less in Nepalese patients. Thrombo-prophylaxis can thus be individualized according to other risk factors rather than use routinely in patients with hip fracture.

Key words: Deep vein thrombosis, Hip fracture surgery, Incidence

INTRODUCTION

Major orthopaedic trauma and surgery in the lower limb are classified in the highest risk category for the thrombo-embolic phenomenon.[1,2] Venous thrombo-embolism is frequently clinically silent or gives unreliable clinical signs. The first clinical manifestation of the disease may be pulmonary embolism (PE) related sudden death, or lately the patient may present with post phlebitic syndrome.[3] So the international consensus statement recommends routine thromboprophylaxis in patients undergoing major orthopaedic surgery. In contrast, the pharmacological thromboprophylaxis is not routinely used in Asian region because postsurgical venous thrombo-embolism is thought to be rare.[4] But the recent upcoming data showed that incidence of venous thrombo-embolism is not as rare as it was previously thought.[5]

Hip fracture is the most common major injury in the elderly and an important cause of mortality and morbidity.[6] Hip fracture in the older people, immobilization following hip fracture and hip fracture surgery are the three independent major risk factors for the development of DVT, so people undergoing hip fracture surgery are the high risk population for developing DVT.

Elderly patients with hip fracture are the common inpatients in the Department of Orthopaedics and Trauma Surgery, TUTH, Kathmandu, Nepal. There is no routine practice of thromboprophylaxis to the patients undergoing hip fracture surgery, rather the prophylaxis is individualized. No study has been done till date in Nepal to determine the incidence of DVT following hip fracture surgery, so there is no evidence for the routine use of DVT prophylaxis to

this group of patients. Thus, this study was designed to determine incidence of DVT in Nepalese patients following hip fracture surgery and determine if the prophylaxis need to be recommended.

METHODS

It was a descriptive study conducted in the department of Orthopaedics, TUTH, Kathmandu, Nepal from October 2009 to September 2011. All patients of 40 years and above with hip fracture (fracture neck of femur, intertrochanteric fracture femur and sub-trocanteric fracture femur) admitted in the department and scheduled for unilateral hip fracture surgery were included in the study. A total of 66 patients were included.

After taking approval from the institutional review board, a written informed consent was taken from the patient who fulfilled the inclusion criteria of the study and did not have any exclusion criteria. For each case a complete demographic detail, nature and duration of surgery, type of anaesthesia and risk factors were noted. All patients were evaluated daily for pedal edema, prominence of superficial veins, leg and ankle swelling, calf tenderness, local rise of temperature and fever since the day of admission to the 5th postoperative day.

The collected data were analyzed using Statistical Package of Social Sciences (SPSS 16.0). Frequency table was made and cross tabulation was done.

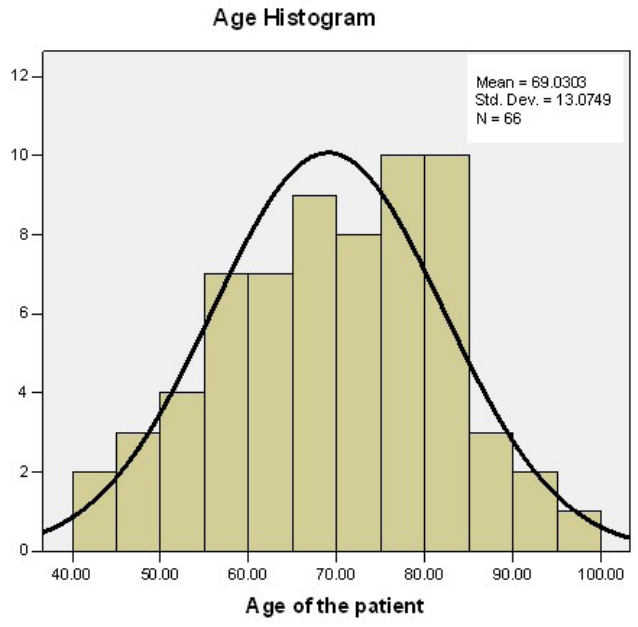


Figure 1: Age Distribution

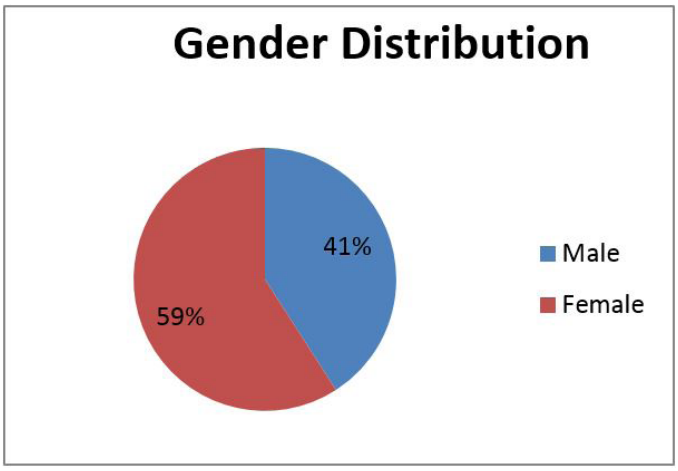


Figure 2: Gender distribution

RESULTS

A total of 66 patients who fulfilled the inclusion criteria were enrolled into the study. All the patients were above 40 years of age, ranging from 40 to 100 years (69.03±13.07years). (Figure:1) Out of the 66 patients, 39 (59%) were female. Female to male ratio was 1.44. (Figure:2)

The patients usually presented to the hospital on an average of 3 days of injury (Range: 0 to 28 days). The most common mode of injury was fall on the slippery ground (51%). Majority of the patients had sustained intertrochanteric fracture (45%) and fracture neck of femur (44%). Only 11% patients had a sub-trochanteric fracture. (Figure: 3)

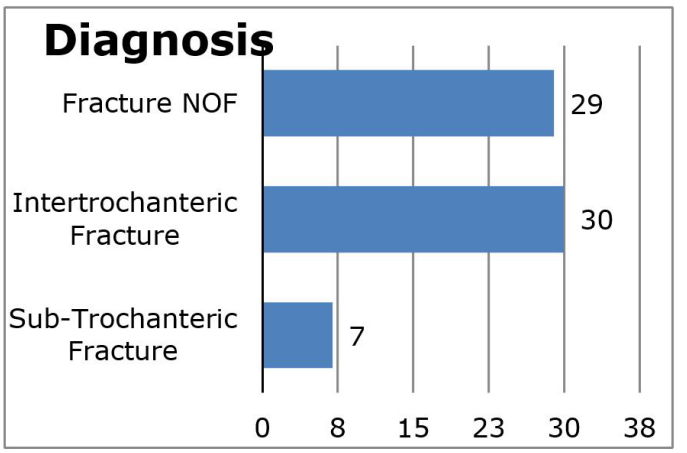


Fig 3: Diagnosis

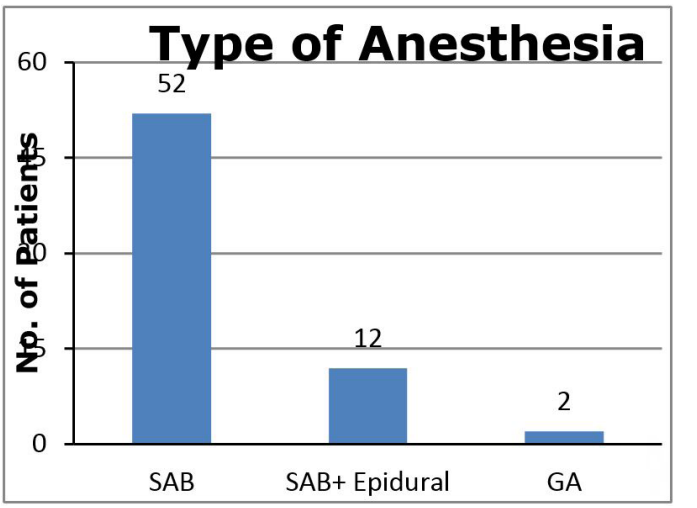
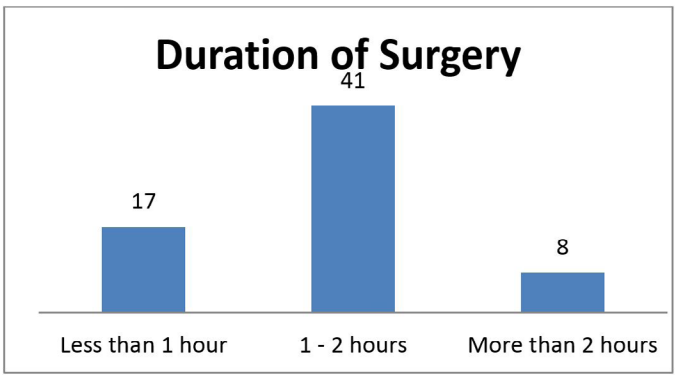


Fig 4: Type of Anesthesia

Most of the patients were operated on an average of 7.66 ± 4.1 days of admission ranging from 1 to 20 days. Most of the surgeries were done under spinal anesthesia. (Figure:4)

Inter-trochanteric fracture and sub-trochanteric fractures were internally fixed with dynamic hip screw (DHS) and barrel plate. Hemiarthroplasty was done for the majority of the fracture neck of femur.

Most of the surgeries were of 1 to 2 hours duration (62%).



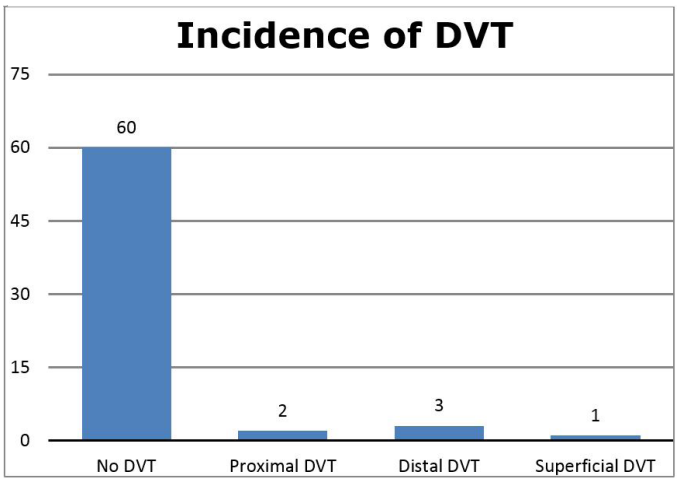


Fig 5: Duration of surgery

Fig 6: Site of venous thrombosis

Among the 66 patients included in the study, 5 patients (8%) developed deep vein thrombosis in the fractured limb. One patient developed superficial vein thrombosis. But no patient developed deep vein thrombosis in the contralateral limb.

The duration of surgery was less than 1 hour in 2 of the cases that developed deep venous thrombosis

and the one case that developed superficial vein thrombosis, while in the remaining 3 cases of DVT, the duration of surgery was between 1 to 2 hours. There was no DVT in any case that lasted more than 2 hours.

The average preoperative immobilization was 11.1 days, ranging from 1 to 40 days. All the patients who developed DVT were immobilized for more than 3 days (5 to 12 day).

DISCUSSION:

Hip fracture is the most common major injury in the elderly and an important cause of mortality and morbidity. In our study age of the patients included in the study ranges from 40 to 100 years (69.03±13.07years). Majority of patients (56.06%) were between the age group of 60 and 80, lying at the centre of Gaussian distribution curve.

In our study, hip fracture was found more common in female population (F 59%; M 41%; F:M= 1.44:1).

In our study, among the 66 patients who underwent hip fracture surgery, 5 patients (8%) developed deep vein thrombosis in the fractured limb, as shown by Doppler ultrasonography at 5th postoperative day. Only one patient developed superficial vein thrombosis. This incidence is far less than that found in studies done in our neighbouring country India.

A prospective study conducted by S. Agarwala, et al in PD Hinduja National Hospital and Research Centre, Mumbai, India in February 1999 to January 2000 among 104 hip fracture patients found that 52% of patients following hip fracture surgery showed venographic evidence of DVT.[7]

A study done by K S Dhillon, et al in Malaysia among 88 patients who had hip fracture surgery or total hip and knee replacements found that the incidence of DVT was 62.5% by venographic studies.[8]

These high differences in incidence in the above studies as compared to ours may be due to smaller sample size in our study, but can also be due to the genetic difference.

Some other studies done in other countries however have found similar incidence as ours. YK Chan, and KY Chui conducted another prospective study among 100 hip fracture surgeries in Hong Kong from January 1996 to July 1996. They found that the incidence of DVT was 5.3% in elderly Chinese people following hip fracture not taking prophylactic heparin. Another prospective study conducted by YW Lim, et al in Changi General Hospital, Singapore from April 2001 to November 2001 among 104 hip fracture surgery patients found that the incidence of DVT was 7.7% following Hip fracture.[4]

Thus we can see a wide variation in incidence of deep vein thrombosis following hip fracture surgery in elderly population in different parts of the world. Generalization of the DVT prophylaxis should thus be based on epidemiological studies in that region and on individual comorbidities.

In our study, of the five patients who developed deep vein thrombosis, two had proximal DVT and 3 had distal.

Mark A Mattos, et al observed in their study of the 159 limbs that had acute DVT, 67% had proximal DVT and 69% had distal DVT.[10]

Findings in above study are consistent with our result, more than half of the patient with DVT had lower DVT.

In our study, the average preoperative immobilization was 11.1 days, ranging from 1 to 40 days. All the patients who developed DVT were immobilized for more than 3 days (5 to 12 day).

Kahn SR, writes in the Article review, "The association between immobility, its duration, and venous thromboembolism has been confirmed in a number of studies. An autopsy study of 253 patients demonstrated DVT in 15% of patients immobilized for less than 1 week, compared with 80% in those with longer periods of immobility. From the second to the eighth day of immobility, 13% of bed-ridden, nonsurgical patients developed DVT diagnosed by daily Full leg sonography. More than half of these developed DVT by the fifth hospital day. Hence, even short periods of immobility increase risk for developing DVT.[11]

In our study all the patients who developed deep

vein thrombosis were immobilized for about 3 days to 14 days.

In this study 12 patients who were immobilized for more than 14 days did not develop DVT. No specific reason could be identified to explain this finding because the patient falling under this group ranges from 40 to 80 years of age, pre-op immobilization ranges from 14 days to 40 days. Because of the small sample size other risk factors for developing DVT could not be matched.

A review of nine studies conducted in the United States and Sweden showed that the mean incidence of first DVT in the general population was 5.04 per 10,000 person-years. The incidence was similar in males and females and increased dramatically with age from about two to 3 per 10,000 person-years at ages 30–49 to 20 per 10,000 at ages 70–79 years.[12]

In our study all the patients who developed DVT were above the age of 60yrs except one, who was a 50 yrs old lady with multiple co-morbidities. She was heavy smoker and chronic alcoholic for more than 15yrs. Despite the fact that age being an independent risk factor for development of DVT other co-morbidities associated with older age group may be the reason for development of DVT at an early age.

One of our patient, a 77 years old lady who was non diabetic, non hypertensive and non smoker, with subtrochanteric fracture femur developed a proximal DVT 3 weeks after the surgery. Her pre-operative immobilization was 4 days and on 5th post op day Doppler study showed no sign of DVT.

Ginsberg JS et al in an overview of 2,361 major orthopedic surgery patients with normal venography at the time of hospital discharge found a 1.3% cumulative incidence of VTE over the following 4 weeks.[13]

All these findings show that the risk of developing DVT persists several weeks following hip fracture surgery. So close follow up, early mobilization, and counseling to the patient is very important.

CONCLUSION

Hip fracture surgery, old age, immobility following hip fracture and co-morbidities associated with old age are the various risk factors for developing DVT. But the incidence of deep vein thrombosis is less in Nepalese population compared to western people as shown in our study. So thromboprophylaxis should be prescribed on the individual basis after thorough risk stratification.

REFERENCES

1. Piovella F. Deep-vein thrombosis rates after major orthopedic surgery in Asia. An epidemiological study based on postoperative screening with centrally adjudicated bilateral venography. Thromb Haemost 2005;3(2):2664–70
2. Rutherford RB, Editor. Rutherford vascular surgery, 6th ed. Elsevier 2008.
3. Das S, Author. A Manual of Clinical Surgery, 5th ed. Dr S. Das India 2000.
4. Lim YW, Chong KC, Chong I, Low CO. Deep Vein Thrombosis Following Hip Fracture and Prevalence of homocysteinuria. Ann Med 2004;33(2):235-8.
5. Bucholz RW, Heckman D, editors. Rockwood and Green's Fractures in Adults, 5th edition. Lippingcott Williams & Wilkins 2001;1619
6. Moran CG, Wenn RT, Sikand M, Taylor AM. Early mortality after hip fracture: Is delay before surgery important? J Bone Joint Surg Am 2005;87:483-9.
7. Agarwala S, Bhagwat A, Modhe J, Dastur FD, Patil S. Incidence of deep vein thrombosis in indian patients. Ind J Orthop 2003;37(2):5.
8. Dhillon KS, Askander A, Doraisamy S. Postoperative deep-vein thrombosis in asian patients is not a rarity. J Bone Joint Surg Br 2005;78-B(3):427.
9. Chan YK, Chiu KY, Cheng SWK, Ho P. The incidence of deep vein thrombosis in elderly Chinese suffering hip fracture is low without prophylaxis: A prospective study using serial duplex

ultrasound. J Orthop Surg 2004;12(2):178-83

10. Mattos MA, Melendres G, Sumner DS, Hood DB, Barkmeier LD, Hodgson KJ, et al. Prevalence and distribution of calf vein thrombosis in patients with symptomatic deep venous thrombosis: A color-flow duplex study. J Vasc Surg 1996;24(5):738-44.

11. Kahn SR. The Clinical Diagnosis of Deep Venous Thrombosis integrating incidence, risk factors, and symptoms and signs. Arch Intern Med. 1998;158(21):2315-2323.

12. Heit et al. Trends in the incidence of venous thromboembolism during pregnancy or postpartum. Ann Intern Med. 2005;143:697-706.

13. Ginsberg JS, Gent M, Turkstra F, et al. Postthrombotic syndrome after hip or knee arthroplasty: a cross-sectional study. Arch Intern Med 2000;160:669-72.