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Original Article

Is it necessary to use chemoprophylaxis in Indian patients after hip surgery?

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ABSTRACT

Aim: To know the incidence of postoperative deep vein thrombosis after hip surgery in Indian patients.

Method: Our study comprises 108 patients undergoing major lower limb orthopaedic surgery. Evaluation by colour Doppler ultrasonography to detect DVT was performed on both lower limbs between seventh and 14th postoperative day. There were 15 total hip replacements (THR), 50 bipolar hemiarthroplasties and 43 proximal femoral fixations by intra-/extra-medullary implant. Only 17 (15.74%) patients showed Colour Doppler evidence of DVT without any complication.

Results: In THR patients, incidence of DVT is 20%; in bipolar hemiarthroplasty, it is 16%; and in the proximal femoral fixation, it is 13.95%. No case developed pulmonary embolism, and the current figure for the incidence of DVT is 15.74%.

Conclusions: From our study, it appears to be the difference in incidence of DVT in our country and in western countries, but incidence is not rare. Hence, chemoprophylaxis is necessary in Indian patients.

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1. Introduction

The venous thromboembolism (VTE) causes significant morbidity and mortality in orthopaedic surgery. It is a potentially fatal and preventable condition.¹ It comprises deep vein thrombosis (DVT) and pulmonary embolism (PE). In orthopaedic

surgeries, several risk factors are present, such as obesity, immobilization, advanced age, fractures, spinal cord injuries, etc. DVT commonly affects the calf veins, popliteal vein, femoral vein and deep veins of the pelvis. DVT in lower limb can be classified on the basis of site of thrombosis as (1) proximal, when popliteal vein is involved (2) distal, when the calf veins are involved. Risk of PE is more common in proximal DVT than

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distal DVT.^{1,2} History and clinical examination are not reliable for diagnosing DVT in the lower limb. It can be symptomatic or asymptomatic. Symptomatic patients present with lower limb pain and tenderness in calf, swelling in calf and thigh, discolouration of limb, prominence of the veins, fever and positive Homan's sign.^{3,4} Majority of the studies have been conducted in western and other Asian countries and have shown that the incidence of DVT is high in major lower limb orthopaedic surgery. In the western population, it varies from 32 to 88% in major lower limb orthopaedic surgery without any thrombo-prophylaxis.^{5–7} But in our country, only few studies have been published showing that the incidence of DVT varies from 7.2% to 60% without thrombo-prophylaxis. Nagi et al.,⁸ Sharma et al.,⁹ Bhan et al.,¹⁰ Maini et al.,¹¹ Mavalankar et al.¹² and Agarwala et al.¹³ reported incidences of DVT as 8%, 19.6%, 23.3%, 9.9%, 7.2% and 60%, respectively. Hence, we have taken this study to estimate the incidence of DVT in Indian patients undergoing major lower limb orthopaedic surgeries around the hip joint.

2. Materials and methods

This prospective study was carried out in the Department of Orthopaedics S.N. Medical College, Agra.

Selection of patients: All consecutive patients were selected from the patients attending the outpatient department and the emergency department between March 2012 and October 2013 for undergoing elective hip surgeries, such as total hip replacement (THR), Bipolar hemiarthroplasty and proximal femoral fracture fixation. A prior consent was obtained from all the patients and the study were approved by the Ethical Committee of the Hospital. The patients were selected on the basis of strict inclusion and exclusion criteria.

Inclusion criteria:

1. Indian patients of both sexes, 18 years or older.
2. Patients were posted for elective hip surgeries, such as unilateral THR, DHS/DCS and Bipolar hemiarthroplasty.
3. Pre-operative no clinical signs of DVT/Colour Doppler negative for DVT.

Exclusion criteria:

1. Previous history of DVT:
  - Ipsilateral
  - Ipsilateral in the past 2 years
  - Two or more episodes, in either extremity
  - Any reports of VTE in the past 2 years
2. Patient on anticoagulation therapy
3. Patient with high risk factors; advisable to take anticoagulant therapy for thrombosis
4. Bleeding disorders

Clinical signs of DVT and colour Doppler sonography results were recorded. All patients were examined daily for

- Positive Homan's sign
- Pain and tenderness in calf
- Prominence of superficial veins

- Swelling in thigh, leg and ankle
- Skin discolouration
- Fever

(A positive Homan's sign – calf pain at dorsiflexion on the foot).

In all selected patients, Colour Doppler sonography was performed by an experienced radiologist using 5–12 MHz linear transducer and 3–5 MHz convex probe that was used in obese patients. Both the surgical and contra-lateral lower limbs were scanned between seventh and 14th day. A standard procedure was used that included evaluation of the following venous segments in all patients: external iliac (distal part), common femoral, superficial femoral, popliteal, posterior tibial and peroneal veins. The proximal veins were examined with the patient in the supine position, and the popliteal and calf veins were examined with the patient in the sitting position with the leg hanging down if feasible. Some established cases of DVT required treatment and started with low molecular weight heparin (Enoxaparin) 1 mg/kg subcutaneously twice daily and simultaneously warfarin tablet 5 mg once daily. Enoxaparin 1 mg/kg is given for 7 days and stopped, and oral warfarin 5 mg once daily continued for three months.

3. Results

In our study, a total of 108 patients were included, of which 62 were males and 46 were females. The average age was 54.48 years. Thirteen patients were with avascular necrosis of the femoral head with secondary arthritis, 52 patients were having neck of femur fracture and 33 patients were having inter-trochanteric/sub trochanteric fracture of femur. Among these, the maximum number of patients was with fracture neck of femur at 48.15%. Fracture neck of femur was more common in female at 30.56% and inter-trochanteric/sub-trochanteric fracture more common in male in 30.56% patients. Avascular necrosis was more common in males (9.26%). Out of 108 patients, only 17 (15.74%) patients developed DVT. In which, 7 (6.48%) patients has proximal DVT, 10 (9.26%) patients has distal DVT and only one patient developed DVT in contra-lateral lower limb. There was no case that developed PE. DVT is more common in THR (20%) than bipolar hemiarthroplasty (16%) and proximal femoral fracture fixation (13.95%). All DVT positive patients were in the age group of 24–72 years with 56.06 years as the average age. The incidence is more common in females (17.39%) than in males (14.52%). In all DVT positive patients, swelling of the calf and thigh was present in 70.58% cases, while pain and tenderness in calf, positive Homan's sign, discolouration of limb, prominence of the veins and fever were present in 47.06%, 35.88%, 11.76%, 17.65% and 29.41%, respectively. Swelling of calf and thigh was 39.56%; pain and tenderness in calf, positive Homan's sign, discolouration of limb, prominence of veins and fever were 10.99%, 2.20%, 0%, 0% and 9.89% of cases without DVT, respectively. One clinical feature was present in 17.65%, two in 17.65%, three in 11.77%, four in 5.88%, five in 5.88% and six in 11.77% of patients who had DVT. In 29.41% patients, they did not show any sign and symptom of DVT. In the group that did not have DVT, 27.41%, 6.59%, 4.40% and 2.2% cases were with one, two, three and four

Table 1 – Finding of colour Doppler ultrasonography of both lower limbs in postoperative patients who developed DVT.

Sr. No.	Surgical procedure done	Total no. of patients	Patients who developed DVT	Proximal DVT in surgical limb	Distal DVT in surgical limb	DVT present in contralateral limb
1.	Total hip replacement	15	3	2	1	1
2.	Bipolar hemiarthroplasty	50	8	3	5	–
3.	Proximal femoral fracture fixation	43	6	2	4	–
	Total	108	17 (15.74%)	7 (6.48%)	10 (9.26%)	1 (0.93%)

clinical features, respectively, and 59.34% patients were not showing any sign and symptom of DVT features, respectively. In our study, patients with DVT, only 11 (64.71%), were immobilized more than 1 week while diabetes and hypertension, h/o tuberculosis and obesity were present in 35.30% and 82.35%, 29.41% and 29.41% of cases, respectively. Of these, 8 (47.06%) were smokers and surgery duration was >1 h in 13 (76.47%) cases. The distribution of risk factors in patients who did not have DVT was diabetes in 17.58%, hypertension in 59.34%, h/o tuberculosis in 9.89%, previous attack of M.I. in 2.19%, smoking in 45.05%, obesity in 15.38%, immobilization >1 week in 61.54% and duration of surgery >1 h in 71.43% of cases, age >40 years present in 78.02% case. There is no significant difference in incidence of DVT in male and female patients and different types of orthopaedic surgeries in the lower limb.

4. Discussion

In our study, we have observed that out of 108 patients operated for major lower limb orthopaedic surgery, 17 patients (15.74%) showed Colour Doppler ultrasonographic evidence of DVT. This incidence is more than the reported incidence in various studies by Froehlich et al.¹⁴ (12%), Nagi et al.⁸ (8%) and Mavalankar et al.¹² (7.2%) and lower than Bhan et al.¹⁰ (23.33%), Sharma et al.⁹ (19.6%) and Agarwala et al.¹³ (60%). Jain et al.¹⁵ reported a very low incidence of DVT following TKA and THA in Indian patients. Agarwala et al. reported 60% incidence of DVT in Indian patients without chemo-prophylaxis and 43.2% with prophylaxis following major lower limb surgery by using contrast venography. Incidence of DVT in the world is showing great degree of variation, i.e., 75% in TKR, 60% in hip fracture surgery, 50–55% in elective hip surgery and 18% in knee arthroscopy.¹⁶ The incidence of DVT was reported as Hongkong¹⁷ – 53.3%, Thailand¹⁸ – 4%, Korea¹⁹ – 10%, Singapore²⁰ – 9.7% and Malaysia¹⁰ – 62.5%. All the above studies were conducted on patients undergoing total hip and knee arthroplasty and in patients of proximal femoral fractures. Screening of the all patients was done by venography.

In our study, it was shown that the sex difference was maximum in 2nd and 3rd decades, and diminished in 4th, 5th, 6th, 7th and 8th decade; it indicated that men and women were affected equally by trauma as age increases. Avascular necrosis with secondary arthritis was more common in younger male patients and history of steroid intakes was present in most of these cases.

In our study, the incidence (15.74%) was low as compared to the western population; proximal DVT was less compared with distal DVT. The reason for this low incidence could be the

genetic factor, inherited resistance to thrombosis formation, environmental factors and may also be low socioeconomic status of our patients. The literature reported that high-level of fibrinolytic activity²¹ and the more common O blood group are also factors for low incidence of DVT in Asian patient.²² The relatively lower incidence can also be attributed to the fact that Doppler study was done only once and the timing of the colour Doppler is also important.

5. Conclusion

We concluded that the incidence of DVT in Indian patients undergoing major lower limb orthopaedic surgery is lower in the western population. This difference of incidence is attributable to the genetic variation, environmental factors, lifestyle modifications and different modalities of investigation. In our study, no significant difference is present in the incidence of DVT in male and female patients and different types of orthopaedic surgeries done around the hip joint. We believe that there is enough evidence in the western literature to advocate routine thrombo-prophylaxis for patients undergoing total joint replacement and surgeries for fractures of the lower limb, but such recommendation for Indian patients undergoing major lower limb orthopaedic surgeries is also necessary because the incidence of DVT in Indian patients is not a rarity. A postoperative Colour Doppler ultrasonography should be preferably carried out within 2 weeks in all patients undergoing major lower limb orthopaedic surgery, such as THR, Bipolar hemiarthroplasty and proximal femoral fracture fixation (Table 1). If required, a repeat colour Doppler ultrasonography should be done. In our study, the number of patients was less; therefore, this study needs confirmation with large number of patients and a multicentric trial. From our study, there appears to be difference in incidence of DVT in our country to the western countries.

Conflicts of interest

The authors have none to declare.

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