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Study of incidence of deep vein thrombosis in patients undergoing major lower limb surgery: A prospective clinical study

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Abstract

Background: Venous thrombo-embolism is a leading cause of morbidity and mortality- in operated patients in the rest of the world. Commonest site of DVT is in lower limbs. Venous thrombo-embolism incidence in patients undergoing orthopaedic surgery was estimated ranging from 32 to 88% in western population. In Indian patients there is significantly reduced information regarding incidence of deep vein thrombosis.

Methods: Study was conducted in Department of Orthopaedics, Mahatma Gandhi Medical College and Hospital. All the patients undergoing major lower limb Orthopaedic Surgery in Mahatma Gandhi Medical College and Hospital, Jaipur from January -18 to June -19 will be included in the study. Systemic random sampling will be used in selecting the study population. All patients will be undergoing ultrasonic evaluation of deep veins preoperatively and on 4th post operative day and 3 months.

Results: A total of 183 patients were in the study, out of which 9 patients developed deep vein thrombosis. Most of the patients of our study were from younger age group 18–30 years. Most common type of surgery in our study was open surgery (54.09%). Most common type of injury in our study was RTA (72.68%). In present study patients were belong to DVT criteria 2, 28.42% patients were belong to DVT criteria 4, 19.13% patients were belong to DVT criteria 3 and 17.49% patients were belong to DVT criteria 1. 67.21% patients duration of surgery was less than 2 Hrs and 32.79% patients duration of surgery was more than 2 Hrs. In present study out of 183, 9 (4.92%) patients with DVT, all patients developed DVT post operatively and was diagnosed on 4th post operative day.

Conclusions: We found enough evidence in the Western literature to advocate routine thromboprophylaxis for patients undergoing surgery for fractures of lower limb. From our study, it appears that DVT in Indian patients with lower limb trauma is a fairly low-incidence problem.

Keywords: Deep vein thrombosis, ultrasonic evaluation, Road traffic accident

Introduction

Venous thrombo-embolism is a leading cause of morbidity and mortality- in operated patients in the rest of the world. Commonest site of DVT is in lower limbs. Venous thrombo-embolism incidence in patients undergoing orthopaedic surgery was estimated ranging from 32 to 88% in western population^[1-4]. In Indian patients there is significantly reduced information regarding incidence of deep vein thrombosis. Most of Indian patients do not get any prophylaxis regime, irrespective of their risk, as risk perceived is thought to be less. But it may be more as in case of CAD which is more prevalent in Indians irrespective of risk factors. Present study is aimed at evaluating risk of DVT so that preventive measures should be more focused in selective groups of patients. The study aimed to identify patients at risk so that preventive measures can be taken especially in these patients. As prevention and treatment both involve money. Further preventive therapy also has its inherent risks. At our hospital, ultrasonic scanning of affected limbs will be performed pre and post major lower limb surgery. We should be conducting a prospective study to estimate the incidence of and associated risk factors leading to genesis of venous thrombo-embolism in Indian peoples had undergone major orthopaedic surgery in Indian circumstances. Wells DVT criteria are used to determine a patient's pre-test probability

of having a DVT. Early diagnosis and treatment of DVT is essential to prevent this catastrophe. The incidence of asymptomatic DVT after a major orthopedic surgery without prophylaxis reportedly ranges from 30% to 80%, whereas the incidence of symptomatic DVT reportedly ranges from 0.5% to 4%.

Material and Methods

Study was conducted in Department of Orthopaedics, Mahatma Gandhi Medical College and Hospital, Jaipur from January 2018 to June 2019. All the patients undergoing major lower limb Orthopaedic Surgery in Mahatma Gandhi Medical College and Hospital, Jaipur from January -18 to June -19 will be included in the study. Systemic random sampling will be used in selecting the study population. Every 4th patient undergoing major lower limb surgery meeting the inclusion and exclusion criteria will be included in the study. Written and informed consent was obtained from all participants before enrolment into the study. 183 patients were taken for our study. All patients will be undergoing ultrasonic evaluation of deep veins preoperatively and on 4th post operative day and 3 months. As majority of patients at present are mobilized within 2-3 days. And after mobilization DVT is rare. Also bleeding and clotting time is evaluated pre-operatively. Prior to the commencement of the study, ethical clearance is obtained from ethical committee of the institution. Routine blood investigations, ECG and cardiological check up was done. Pre anaesthetic fitness was obtained from the anaesthesia department.

Selection criteria

Inclusion criteria

Patient with THR, TKR, HIP fractures and any major lower limb surgery

- Age =18- 70 years
- Smokers
- History of cancer
- Use of regional anaesthesia
- CRF
- CHF
- Family h/o varicose vein
- Obesity (BMI>30)
- Surgery lasting > 2 hrs
- Post-operatively immobilization >72 hours.

Exclusion criteria

- Age below 18 or over 70
- Patients having H/O CVA
- H/O bleeding disorders
- Anti coagulant or anti platelet drugs, LMWH
- Established DVT
- Females taking HRT
- Peripheral vascular disease
- Patients not giving informed consent for the procedure.

Types of subjects - Patients undergoing orthopaedic and other major lower limb surgery.

Results: The results are analysed under the following headings.

1. Distribution of age of patients:

Age (years)	No. of patients	Percentage
18-30	59	32.24
31-40	17	9.29
41-50	32	17.49
51-60	20	10.93
>60	55	30.05
Total	183	100.00

2. History of the Injury:

Type of Surgery	No. of patients	Percentage
AVN Hip	2	1.09
Fall from height	1	0.55
Fall on ground	27	14.75
RTA	133	72.68
OA Hip	2	1.09
OA Knee	18	9.84
Total	183	100.00

3. DVT wells Criteria:

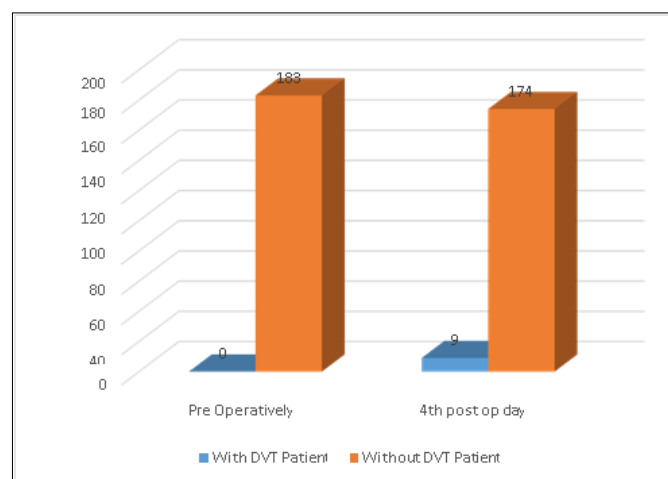
DVT Criteria	No. of patients	Percentage
1	32	17.49
2	64	34.97
3	35	19.13
4	52	28.42
Total	183	100.00

4. Duration of Surgery

Duration of Surgery	No. of patients	Percentage
Less than 2 hour	123	67.21
More than 2 hour	60	32.79
Total	183	100.00

5. Results

	Pre Operatively	4 th post op day	3 months post operatively
With DVT Patient	-	9 (4.92)	-
Without DVT Patient	183 (100%)	174 (95.08)	-
Total	183	183	-



In our study out of 183 patients none with DVT preoperatively, 9 patients out of 183 developed DVT post operatively and was diagnosed on 4th post operative day.

Discussion

This Prospective clinical Study was conducted at Department

of Orthopaedics, Mahatma Gandhi Medical College and Hospital, Jaipur. All 183 patients admitted in orthopedic trauma ward was subjected to the study which included after consent. All patients was undergoing clinical and ultrasonic evaluation of deep veins preoperatively and on 4th post-operative day and at 3 months. As majority of patients at present are mobilized within 2-3 days. And after mobilization deep vein thrombosis rare. The varied signs and symptoms that are associated with deep vein thrombosis make the diagnosis of deep vein thrombosis difficult and challenging. Furthermore, the thrombi may be asymptomatic making it exceedingly difficult to diagnose on clinical presentation. For proper management of the patients with deep vein thrombosis, the nature, location and the extent of the thrombus is necessary to know. The study included assessment of spectrum of findings of deep vein thrombosis by using color Doppler USG. All the major deep veins and superficial veins of the lower limb were examined in all patients along with the external iliac, common iliac and IVC in indicated cases. Duplex USG has a sensitivity and specificity of about 95% and 98%, respectively, for detecting deep vein thrombosis in symptomatic patients. In cases of isolated calf vein thrombosis, serial Doppler study (once weekly for 2 weeks) is suggested for propagation of thrombus into the proximal veins (popliteal vein or above) [5]. Association of development of Deep vein thrombosis after major surgeries especially after major orthopedic Lower limb surgeries is well established, hence these patients are considered to be at higher risk. It has been estimated that approximately 3% of patients who undergo major orthopedic Lower limb surgeries without thrombo prophylaxis develop clinically overt VTEs [6] and asymptomatic deep vein thrombosis are seen in 30- 80% patients [7-8]. It was found that despite the high proportion of risk factors for deep vein thrombosis, only a small proportion of patients hospitalized for a medical-illness developed deep vein thrombosis. In earlier studies from western countries, the incidence of deep vein thrombosis among medical in-patients was found to be 10-20 per cent, and it was 10-80 per cent among critical care patients [9]. In a recent survey of hospitals from 32 countries worldwide, about 42 per cent of hospitalized medical patients were found to be at risk for venous thrombosis [10]. In the same study, a comparable proportion (45%) of medical in-patients in India was found to be at risk. However, we did not find a statistically significant association between any of the clinical or laboratory risk factors and the development of deep vein thrombosis. This is most probably due to a lack of adequate statistical power in view of the very low number of patients who developed deep vein thrombosis. As far as the incidence of deep vein thrombosis is concerned, most of the published studies from India have reported a low incidence of deep vein thrombosis among hospitalized patients. However, all these studies were carried out on surgical or orthopedic patients. Most of the patients of our study were from younger age group (18–30 years). Rajendra Singh *et al.* [11] was observed that total of 212 patients underwent lower limb surgery in their unit. 27 of which were below 15 years of age and three had evidence of deep vein thrombosis on pre op assessment and most of patients were younger. Chirag S Kapoor *et al.* [12] observed that 55 (44%) patients fall under the young age group of 21–40 years followed by 36

(28.8%) patients under the age group of 41–60 as is usually seen in all trauma series.

Nagam Kirthi Chandra *et al.* [13] was observed that mean age of the patients was 52 yrs. and 95 (57.9%) were above 65 years of age.

In our study out of 183 patients, 130 (71.03%) patients were males and 53 (28.97%) patients were female. Most of the patients are male in our study as male predominance is seen in all trauma series. In present study out of 9 (4.92%) patients with deep vein thrombosis, all patients developed deep vein thrombosis post operatively and was diagnosed on 4th post operative day.

Recommendation

A multi centric study involving a larger number of patients with lower limb trauma in future is required to confirm findings of this research which would help resolve the dilemma in India whether or not to subject the lower limb trauma patients to chemoprophylaxis for DVT.

Conclusion: Hence we conclude that we found enough evidence in the Western literature to advocate routine thrombo- prophylaxis for patients undergoing surgery for fractures of lower limb, there is not yet enough evidence to justify the same for Indian patients undergoing major lower limb surgery. From our study, it appears that DVT in Indian patients with lower limb trauma is a fairly low-incidence problem. Though it is perhaps not appropriate to make any definite recommendation about chemoprophylaxis only on the basis of our research, we advocate that the orthopaedic surgeons should use pharmacological prophylaxis only for the high- risk patients in whom the potential benefits clearly appear to outweigh the risks

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Ethical approval: The study was approved by institutional ethics committee

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