



Thromboprophylaxis in Abdominopelvic Oncosurgery, Single Center Experience



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Abstract

Venous thromboembolism is a serious and common condition in especially those undergoing major oncosurgery. Appropriate thromboprophylaxis results in significant reduction in morbidity and mortality associated with it. The objective of this study was to assess patterns of thromboprophylaxis in this subset and prospective development of VTE in these patients at a tertiary medical center. After ethical clearance, 100 eligible patients undergoing abdominopelvic oncosurgery at St John's Medical College Bangalore were prospectively studied for thromboprophylaxis and Doppler screening of lower extremity DVT at 2-3 weeks post procedure. Data was analyzed using SPSS 20.0. Majority of the patients (73%) received appropriate thromboprophylaxis and all of them received some prophylaxis using heparins. Postoperative asymptomatic DVT was seen in 4% of patients. Higher age, gastrointestinal tumors, duration of anesthesia and palliative procedures indicating advanced stage strongly correlated with incidence of DVT. VTE is a significant problem associated with abdominopelvic oncosurgery and thromboprophylaxis is effective in reducing morbidity and mortality associated with it. Extended prophylaxis should be considered in patients having advanced disease.

Keywords: Deep vein thrombosis; Anticoagulation; Thromboprophylaxis; Oncosurgery

Introduction

Venous thromboembolism (VTE) comprising of Deep vein thrombosis and/or Pulmonary embolism is a major health care problem with significant morbidity and mortality⁽¹⁾. Deep vein thrombosis and cancer are closely related with cancer patients having a four to seven fold risk of

VTE compared to non-cancer patients⁽²⁾. The reported incidence of DVT in cancer patients is up to 15% per year⁽³⁾. Thrombotic events are the second leading cause of death in cancer patients after death from the cancer itself⁽⁴⁾. Although thrombosis can develop in any section of the venous system, most frequently it

begins in the valvular cusps of the deep veins of the leg. Lethal complication of this would be embolization of the thrombus to the pulmonary arterial circulation causing hemodynamic compromise⁽⁵⁾.

Causative factors for venous thromboembolism (VTE) are multiple, however the tendency to get it depends on several factors such tumor type, stage of disease, associated multimodality treatments such as of chemotherapy and/or hormone therapy, surgical procedures, duration of anesthesia, the use of a central venous catheter, age, immobilization and previous history of thrombosis^(6,7).

Venous thromboembolism -related events following surgery are often under-reported because they are not symptomatic, are diagnosed in retrospect after venous stasis syndrome occurs, or are uncovered post-mortem.

Identifying a patient at high risk and providing thromboprophylaxis is the best approach⁽⁸⁾. Prevention of VTE is considered a patient-safety measure in most mandated quality initiatives. The measures for prevention of VTE include mechanical methods (graduated compression stockings and intermittent pneumatic compression devices) and pharmacologic agents⁽⁹⁾. Thromboprophylaxis is the most effective measure to decrease the disease burden in VTE. Guidelines of most of the professional societies recommend that all patients with malignant disease undergoing major surgical intervention should be offered pharmacologic thromboprophylaxis with either unfractionated heparin (UFH) or low molecular weight heparin (LMWH) unless there are contraindications such as active bleeding or bleeding tendency or allergy to heparins. The prophylaxis should be commenced preoperatively thromboprophylaxis for patients undergoing major surgery for cancer should be continued for at least 7 to 10 days. Extended prophylaxis with LMWH for up to 4 weeks post-operatively is recommended for patients undergoing major oncosurgery involving abdomen or pelvis either by open or laparoscopic techniques and have associated high-risk features, such as restricted mobility, obesity and previous history of VTE etc. In lower-risk surgical settings, the decision on appropriate duration of thromboprophylaxis should be made on a case-by-case basis^(10,11).

Standard dosage of commonly used drugs as per American society of clinical oncology are, Unfractionated heparin(UFH)-5,000U, started 2-4 hours prior to procedure, restarted at 10 -12 hours and continued 8th hourly thereafter. Low molecular weight heparins Dalteparin - 5000 U, Enoxaparin-40 mg are started 2-4 hours preoperatively, restarted at 10-12 hours and once daily thereafter.

The objectives of the study were, to study the pharmacological thromboprophylaxis pattern followed in the study Centre among the group of patients who undergo abdominopelvic oncological surgeries. Secondly to study the incidence of developing post-operative DVT in each thromboprophylaxis pattern group, screened by Doppler ultrasound.

Methodology

This was a prospective observational study approved by institutional ethical review board in St. John's Medical College Hospital, Bangalore. Consecutive 100 patients presenting to the hospital, who fulfilled the criteria were included in the study. Patients with age of more than 18 years undergoing abdominopelvic cancer surgery were eligible whereas patients with current or past VTE were excluded. Informed consent was taken from all the patients. At inclusion in to study detailed history, co-morbidities, type of cancer and nature of surgery and VTE risk assessment will be recorded. Subjects will be grouped under different groups, according to the DVT prophylaxis treatment given by each discipline. Group 1 was patients who received no prophylaxis, Group 2 was those who received some form of prophylaxis. Patients receiving standard 7-10 days of anticoagulation were included in Group 3, whereas Group 4 consisted of patients receiving extended prophylaxis for 4 weeks. Study subject were reassessed between second and third week for the development of DVT by Doppler scan, in case of clinical suspicion any time Doppler scan can be taken. Compression Doppler Ultrasonography (CDU) was performed by Radiologists in the department of Radiology using linear probe 7-12 MHz. Veins of both lower limbs were studied as iliofemoral, femoropopliteal segments and the distal veins. Hypoechoic filling defects with non-compressible veins were diagnosed as deep vein thrombosis.

Descriptive statistics were reported using mean and standard deviation for the continuous variables, number and percentage for the categorical variables. Chi-square test was done to test the association between categorical variables. Analysis of variance was done to compare the means between outcomes. P value less than 0.05 was considered statistically significant.

All the analyses were done using SPSS version 20.0.

Results

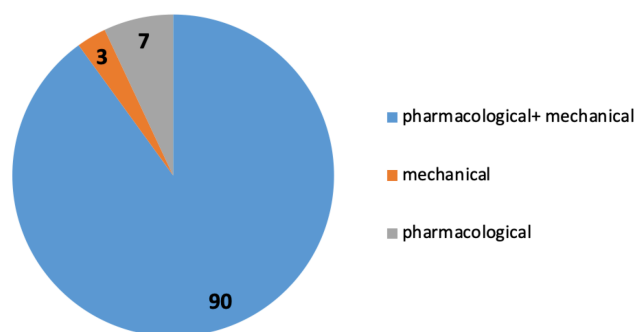
There was a female preponderance in the study population, with 69 out of the 100 patients being female and 31 being males Table 1 . Majority of the participants be aged below 60 years (71%) and 29% aged above 60 years with mean age of 51.7. The body mass index of the patients was analyzed and found that 45 patients had BMI below 22kg/m³ and 55 had BMI above 22kg/m³.

HypP

Majority of our study group patient (73%) received pharmacological and mechanical prophylaxis according to the standard guidelines. Study also revealed that none of the patient were received extended pharmacological prophylaxis and 24 patient received pharmacological prophylaxis but it was not according to standard recommendation as far as the dosage, duration and pre-operative prophylaxis are con-

Table 1. Demographics

Particular	Number(Percentage)
Age	57.14
Sex	M-31, F-69
Comorbidities	Hypertension 28,Diabetes19
Ca stomach	11
colorectal	22
Gynaeconcology	39
Urogynaecology	16
Hepatopancreatobiliary	04
Others	08
Curative surgery	85
Palliative syrgery	15

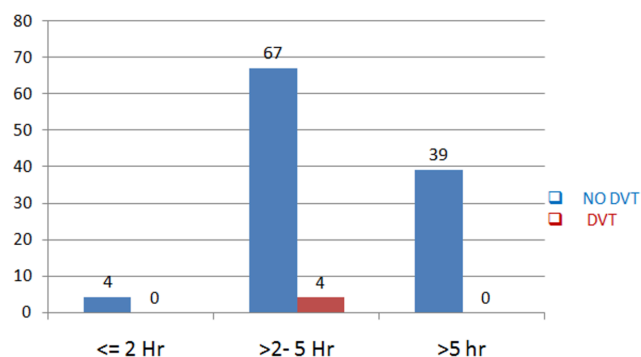
**Graph 1: Thromboprophylaxis pattern**

cerned. Four patients developed deep vein thrombosis during the screening period. Among those who developed DVT three received standard pharmacological thromboprophylaxis for 7- 10 days or more and remaining one was in group 2 received pharmacological thromboprophylaxis, not as recommended as per dosage and preoperative prophylaxis Table 2. But statistical analysis this data was not significant (P value-0.16).

Duration of the surgery was grouped into less than 2 hours, 2 to 5 hours and more than 5 hours. Duration of 71 surgeries was found to be between 2 to 5 hours Graph 1.

Three drugs were mainly used in the pharmacological prophylaxis; Enoxaparin, Daltaparin, Heparin (unfractionated). Of 97 patients who received pharmacological prophylaxis, 43 received Enoxaparin, 42 received Daltaparin, and 12 received Heparin. The incidence of postoperative DVT was almost double in Daltaparin group as compared to enoxaparin and conventional Heparin.

Commonest malignancy in the study was gynaecological in origin (39%) with cervical cancer 13%. Gastrointestinal

**Graph 2: Anaesthesia time Vs Outcome**

cancer was next common with 33% in incidence.

Analysis of type of surgery verses outcome have shown that one patient developed DVT among 85 patients who underwent curative surgery for abdominopelvic caner, of 15 patients who underwent palliative surgery three developed DVT Table 3. Statistical analysis on type of surgery and DVT is significant with p value of 0.01. On subset analysis, age of the patients who had DVT was more than 50 years, GI malignancy was common (75%), two patients received preoperative chemotherapy and they received prophylaxis for an average of 11 days.

Among the patient developed deep vein thrombosis, three developed after discharge while one developed during hospital stay on post-operative day 10. Iliofemoral Deep vein thrombosis was seen in one patient whereas other three patients were found to have femoropopliteal segment involvement. All these patients were asymptomatic and none were worked up for Pulmonary embolism in view of haemodynamical stability.

Discussion

In our study the average age of patients was 51.7 which is much lower than the world literature⁽¹²⁾.

Hypertension and Diabetes were the most commonly associated co-morbidities however, a direct relation between these and the development of DVT was not evaluated as review of literature doesn't implicate it.

Despite of evidence in favor of thromboprophylaxis for Cancer surgeries, most centers are not following the same. The ESSENTIAL trial demonstrated that 75% of patients undergoing major cancer surgery did not receive appropriate extended venous thromboembolism prophylaxis. All the patients in our study who were eligible for thromboprophylaxis, received it, which is in good compliance with the standard guidelines^(13,14).

In our study 90% of the study population received both mechanical and pharmacological prophylaxis as the com-

Table 2. Prophylaxis Vs Outcomes

Screening Doppler between 2 nd and 3 rd week					
	Total number	No DVT	DVT	Chi-squared value	P value
Group of categories	One – 3	3	0	0.98	0.16
	Two – 24	23	1		
	Three – 73	70	3		

Table 3. Type of surgery Vs outcome

Screening Doppler between 2 nd and 3 rd week					
	Names – N	No DVT	DVT	Chi-squared value	P value
Type of surgery	Curative – 85	84	1	7.37	0.01
	Palliative Surgery – 15	12	3		

bined regimen of pharmacologic and mechanical prophylaxis may improve efficacy, especially in the highest-risk patients⁽⁹⁾. The incidence of DVT, PE, and total VTE within 1 month following surgery varied widely across a spectrum of cancer diagnoses, ranging from 0.19%, 0.12%, and 0.28% for breast resection to 6.1%, 2.4%, and 7.3%, respectively for esophagectomy⁽¹⁵⁾. In another study, among 1,015,598 cancer patients, 34,357 (3.4%) were diagnosed with deep venous thrombosis and 11,515 with pulmonary embolism (PE) (1.1%) for an overall VTE rate of 4.1%⁽¹²⁾. Our study has same incidence of DVT similar to the above studies. Interestingly, a multi-centric study from India involving 300 patients showed that only 48% received thromboprophylaxis and none developed DVT, which is not comparable to our study. The possible difference could be that this study only did look at symptomatic patients and the real number of cases would have been missed as many DVT are asymptomatic⁽¹⁶⁾.

The rate of late VTE is estimated to be between 10% and 20%. A meta-analysis of two studies using dalteparin or

enoxaparin has shown that prolonging thromboprophylaxis for a further 3 weeks significantly reduces the risk of late occurring VTE by 62%⁽¹⁷⁾.

In our study, majority of the DVT (3/ 4) occurred in patients undergoing palliative surgery; this data statistical analysis was significant with p value of 0.01.

Conclusion

Our main finding was that pharmacological prophylaxis for week after surgery for abdominal or pelvic cancer significantly reduced the frequency of postoperative venous thromboembolism but extended prophylaxis may benefit patients undergoing palliative surgery for the same.

Limitations of the Study

It is a small study, Cancer specific VTE assessment scoring would have been better than Wells score.

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