

PRESCRIBING PATTERNS OF ENOXAPARIN IN HOSPITALIZED PATIENTS IN A TERTIARY CARE CENTRE

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ABSTRACT

Purpose: The aim of the study is to determine the various prescribing patterns of enoxaparin in hospitalized patients in tertiary care center.

Patients and methods: The method of study is conducted to assess the prescribing patterns of enoxaparin in tertiary care center. Baseline demographic details are collected from patient case reports. The results obtained are analyzed and evaluated statistically. All the required relevant information or data is collected from patient record and laboratory records.

Results: In demographic details, the patients who met with the inclusion criteria were studied in which male patients are more prone to various heart diseases in which enoxaparin was prescribed.

Conclusion: In summary, we have concluded that LWMH like enoxaparin is best drug of choice and can frequently be used to reduce various side effects of both in and outpatients in tertiary care center. Our data implies that ENOXAPARIN is more efficacious than other anticoagulants like warfarin, fondaparin etc...in various treatments like bleeding complications and DVT.

Keywords: LWMH, warfarin, Enoxaparin, anticoagulants, bleeding complications, DVT.

INTRODUCTION

Enoxaparin is an anticoagulant that helps prevent the formation of blood clots. Enoxaparin is used to treat or prevent a type of blood clot called deep vein thrombosis (DVT), which can lead to blood clots in the lungs (pulmonary embolism). A DVT can occur after certain types of surgery, or in people who are bed-ridden due to a prolonged illness¹. Enoxaparin is also used to prevent blood vessel complications in people with certain types of angina's (chest pain) or heart attack. There by, wide variation of enoxaparin prescribing patterns exist depending on the indication of its use and underlying comorbidities. Enoxaparin is injected under the skin or as an infusion into a vein, where a health provider teaches how to properly use the medication on their own. Patient should be sitting or lying during the injection, where it shouldn't be injected into the muscle because it could cause bleeding into the muscle so it should be administered subcutaneously to avoid the risk.² Enoxaparin should be injected in a different place each time when given as an injection. It shouldn't be injected into the same place 2 times in a row because a severe blood clot may be seen in the area where it is injected. Enoxaparin should be stored at room temperature away from moisture and heat. Each single use prefilled syringes of enoxaparin is used only once and must be thrown away after one use, even if there are still medicines left inside. Major and complicated side effects of enoxaparin include: Unusual bleeding or bleeding that doesn't stop, Purple or red spots seen under the skin, Nose bleeding and blood gums, Abnormal vaginal bleeding and bleeding and blood during urination, Blood vomiting's and coughing up of blood is seen, Anemia, pale skin, unusual tiredness, shortness of breath, cold hands and feet.³

Prescribing patterns for the Treatment of VTE in cancer patients:

VTE is a common condition among cancer patients. It is one of the signs in cancer patients and it is difficult for patient care in these patients. Studies prove that 15 to 20% of acute VTE are associated with malignancies, 2-5% are diagnosed with cancer and 5-10% cases are diagnosed during the follow up visit of cancer. Hence VTE is a complication that affects quality of life of a patient and it is the leading cause of death in patient population and it is observed in 50% of cancer patients.

Management of VTE in cancer patients is difficult for oncologists due to patient specific conditions, risk factor due to treatment and other comorbidities like cardiac, pulmonary, renal dis functioning, obesity and patients above 65 years of age.

Risk factors that lead to development of VTE in cancer patients are due to chemotherapy, hormone therapy, indwelling central venous catheters. Of all these chemo therapies is the leading cause of developing VTE.

Drugs that are associated with increased risk of VTE are thalidomide and lenalidomide that are used in the treatment of multiple myeloma and myelodysplastic anemia. The patients who are under this treatment are prescribed anticoagulants to reduce the risk of VTE.⁴ Standard treatment regimen for the treatment of VTE in these

types of patients include LMWH, unfractionated heparin, Fondaparin for the first 5-10days followed by warfarin for next 3 months. This treatment is best option for reducing the risk of VTE.⁵ Among all anticoagulants LMWH are best drug of choice as they can be easily administered in outpatients with reduced adverse effects such as heparin induce thrombocytopenia. Observation of comparison of LMWH with oral anticoagulants resulted that LMWH has shown to reduce the risk of bleeding in treatment in cancer patients as patients with cancer shown resistance to warfarin when they administer them.⁶

Anticoagulation in atrial fibrillation:

Use of anticoagulants in atrial fibrillation reduced the risk of bleeding complications. When comparison is made between demographic characteristics and clinical risk factors among HMO patients and those in the clinical trials results shown that HMO patients have greater comorbidities than clinical trial participants. Monitoring is done at regular intervals estimated between 36 and 49 days and that was compared with 21 to 28 days report in clinical trials. The ratio of prothrombin time in HMO group was in a target range of 50% more days when compared to 68 days of clinical trials. The major bleeding in both the groups has no significant difference but the annual minor bleeding is greater in HMO group compared with clinical trials group⁷

ENOXAPARIN EFFECTIVE DOSAGE IN TERTIARY CARE UNIT PATIENTS:

Tertiary care patients are predisposed to thromboembolism in most of the cases. Routine prophylactic anticoagulation is widely recommended for tertiary care unit patients. Low molecular weight heparin such as enoxaparin is increasingly used for the patients widely because of its predictable pharmacokinetics. Enoxaparin is frequently prescribed medication in cardiovascular diseases where prescribing pattern of LMWH's in CVD's is necessary to recommended the modifications to achieve rational and cost-effective medical care.⁸ Few studies stated that LMWH's are highly prescribed category of anti-coagulant where, enoxaparin is more prescribed than dalteparin for tertiary care unit patients. Enoxaparin results in increased bleeding complications and use of blood products in patients with renal insufficiency. Enoxaparin has low protein binding and excellent bioavailability at low dosages allowing for patient's administration with less frequency monitoring. The dosage regimen effectiveness in obese patients have not been established with enoxaparin at one time. Enoxaparin in patients with high bleeding risk should adjust few dosing guidelines in tertiary care unit. Few studies also stated that systemic anticoagulation with subcutaneous enoxaparin dosing provides an effective and renal replacement procedure in critically ill patients with hypercoagulability in tertiary care unit⁹.

Enoxaparin dose magnitude have few alterations that are based on the patient's weight which is further cannot be allowed in high proportion doses to patients in tertiary care unit. The impact of increased enoxaparin dosing frequencies are majorly seen in venous thromboembolism events, bleeding etc... based on their therapeutic events. Few and rare cases like severe poisoning with a somber prognosis, in which unexpected survival of the patients are seen where enoxaparin was the only change during the standard treatment for patients in tertiary care unit¹⁰.

MATERIAL AND METHODS:

For the present study, approval of Institutional Ethics Committee, Durgabai Deshmukh hospital was taken. This perspective observational study was conducted for 3 months in various departments who was prescribed with enoxaparin, Durgabai Deshmukh hospital, a 300 bedded multi-specialty hospital.

Baseline demographic data will be collected from the patient case report. Patients Data Collection Form is filled after collection of case report. All the patients receiving the enoxaparin drug were included in the study. Determine the appropriateness of the dosing pattern depending on indication and comorbidities. All attributes were summarized descriptively. The demographic and other baseline characteristics of the patients (e.g. age, gender, etc) are summarized in the table. Deviation values of the middle and default were measured using microsoft excel. For easy interpretation data was represented using tables and graphs. Data analysis was conducted using student T test.

RESULTS:

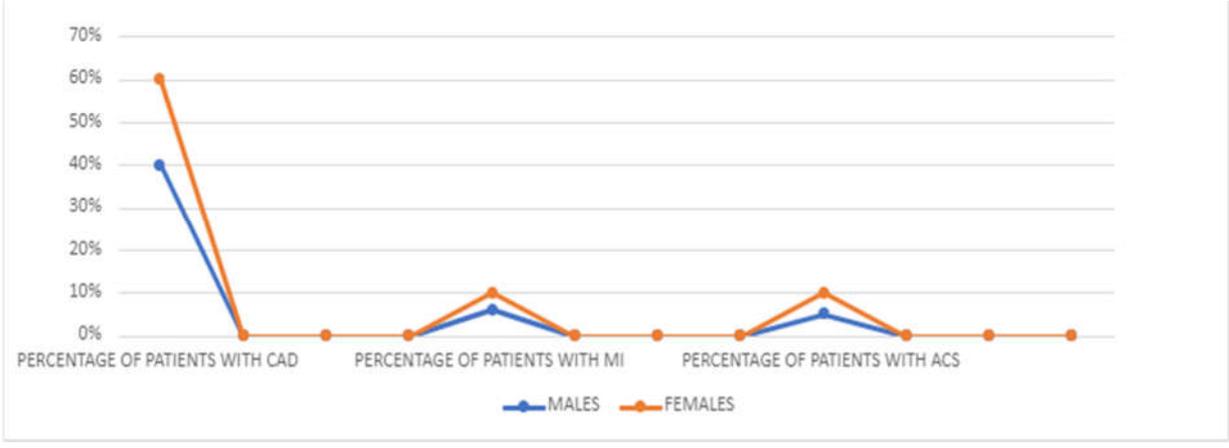
The patients who met the inclusion criteria were under the study.

Compared to female's male are more effected to heart diseases that was leading to bleeding complications.

Almost 80% of the males with coronary artery disease are prescribed enoxaparin in the dose of 40mg SC twice daily. Only 20% of the women are in reduced risk of CAD and are prescribed enoxaparin

Gender	percentage	Disease condition in cases
Male	80% of patients with CAD	Coronary artery disease, acute coronary syndrome, AAMI, VTE
Male	20% with AAMI	Coronary artery disease, AAMI
Female	50% with CAD	Coronary artery disease, VTE
Female	40% with LRTI	LRTI, CAD, VTE

Table5 : gender wise distribution according to diseases

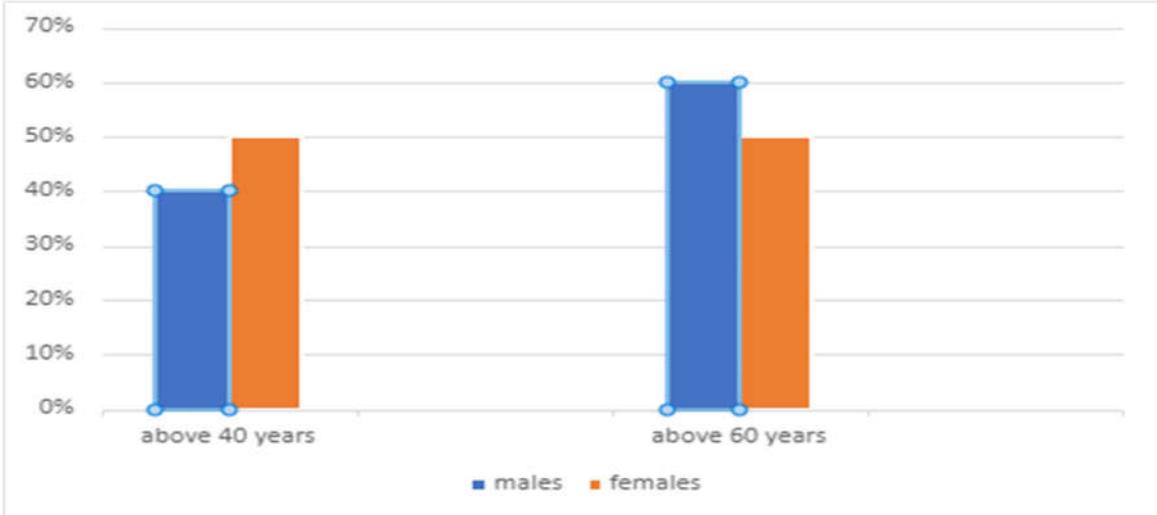


Graph 1: gender wise distribution

Both males and female over the age of 40 are observed in the study who are more prone to CAD and prescribed with enoxaparin. Most of the patients with specific heart diseases occurs in the age group of above 40 and risk factor occurring due to these specific disease conditions like bleeding complications. Cancer can occur in any age group and due to chemotherapy, risk factors occurs and hence enoxaparin is prescribed.

Gender	40-50 year	60-70 years	70-80 years
males	40% with risk	30% with risk	30%
females	30% with risk	30% with risk	40%

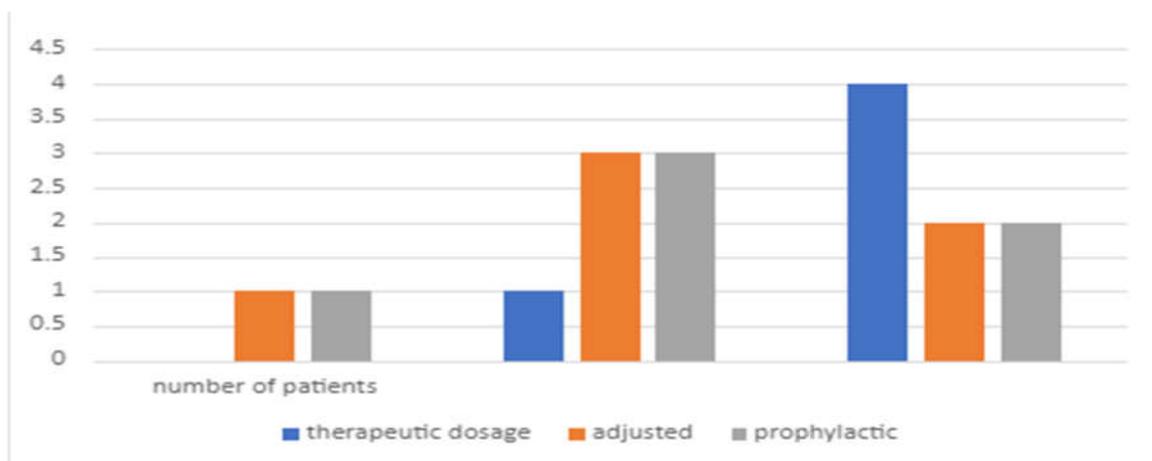
Table 6: age wise distribution



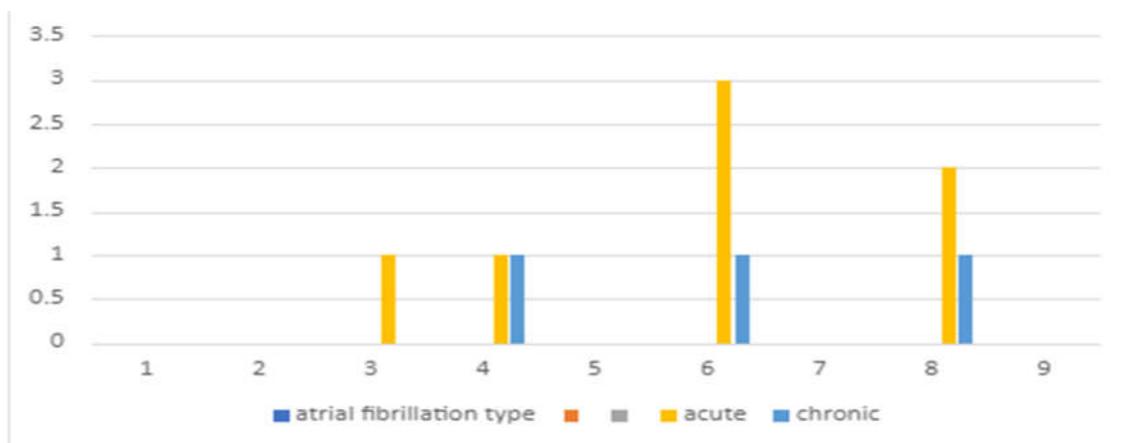
Graph 2: age wise distribution

characteristics	No of patients			
	stroke	Any thrombosis	Any bleeding	Major bleeding
Dosage strategy				
therapeutic	0	1	4	2
adjusted	1	3	2	1
prophylactic	1	3	2	3
Atrial fibrillation type				
acute	1	1	3	2
chronic	0	1	1	1
MI				
high	1	0	2	3
moderate	0	1	1	0
LOW	0	0	1	0

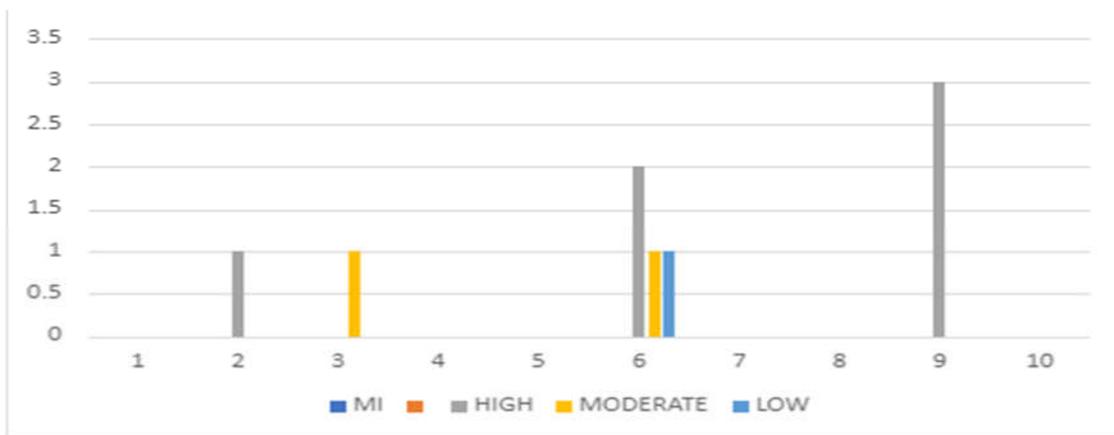
Table 7: clinical events in patients according to dosage strategy, type of atrial fibrillation, MI risk



Graph 3: Dosage strategy in individual patients

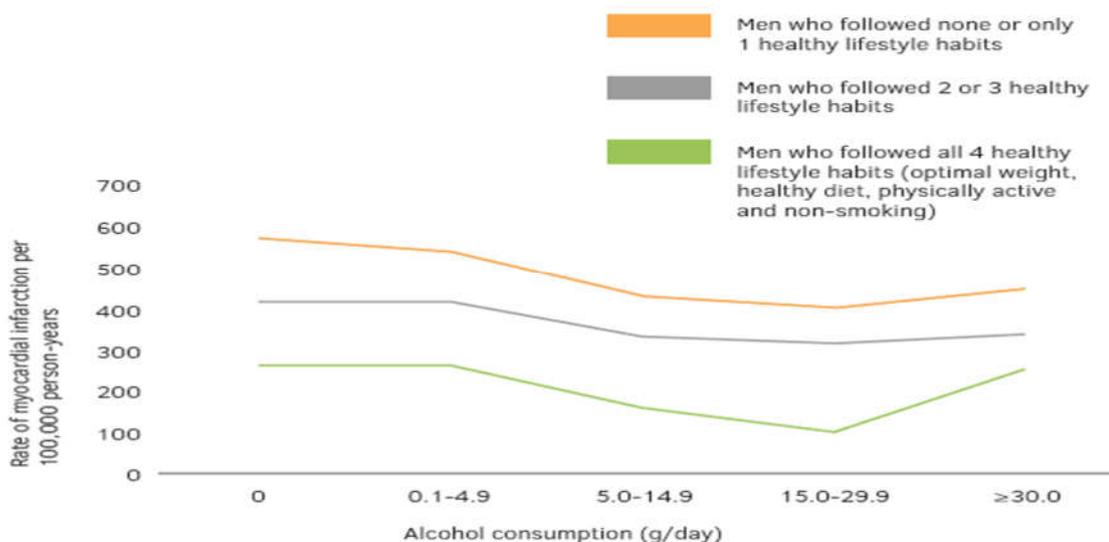


Graph 4: Atrial fibrillation type



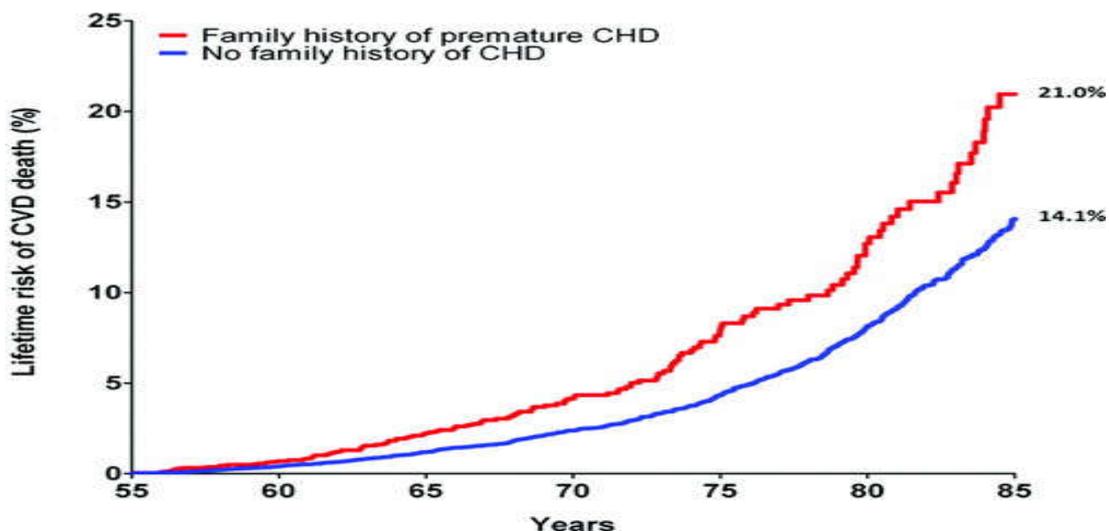
Graph 5:MI type

In personal habit wise distribution, we observed that high prevalence is seen in smoking and alcohol consuming habits. Highest prevalence was observed in these groups.

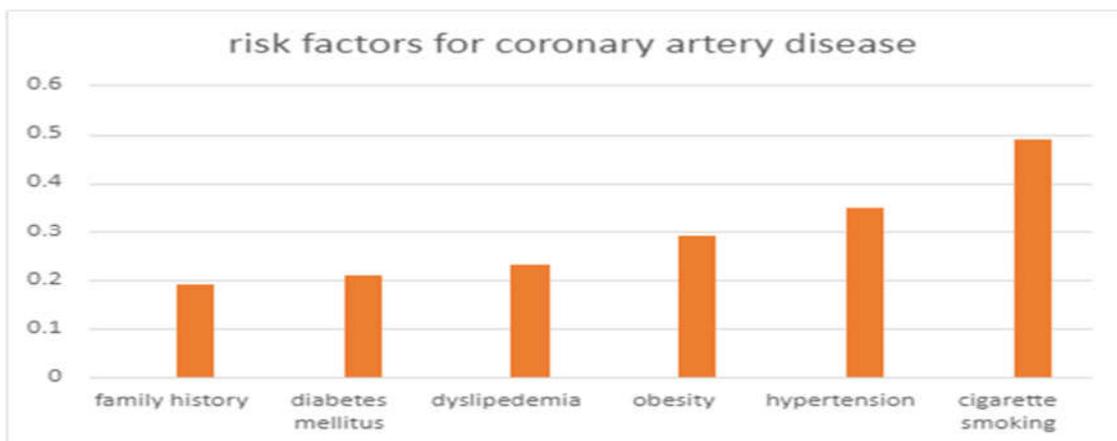


Graph 6: Personal habit wise distribution

A family history of heart disease is associated with increased risk of coronary heart disease, mainly when our family members develop heart disease in an early age of 55 or over the age of 65. The chance of developing the disease is more that leads to the complications.



Graph 7: Family history wise distribution



Graph 8: Risk factor wise distribution

DISCUSSION:

Our study comprises of 30 patients selected from DURGABAI DESHMUKH HOSPITAL located in Vidyanagar, Hyderabad. The selected samples were categorized based on their demographic parameters like age, gender and specific disease condition, patient dietary habits. Prospective observational study is performed to determine the prescribing patterns of enoxaparin in various disease conditions.

DEMOGRAPHIC RESULTS:

- The purpose of the study is to find how to enoxaparin effects patient in various conditions like cancer, CAD, Atrial fibrillation.
- According to literature, in cancer patients due to chemotherapy, hormone therapy and use of the drugs like thalidomide and lenalidomide that are involved in increased risk of developing VTE, use of LWMH in cancer patients has increased significantly because of the reduced risk of VTE in most of the patients with cancer.

- In atrial fibrillation patients there may be increased risk of bleeding complications due to therapy and the risk is reduced by prescribing LMWH like enoxaparin for a period of time.
- According to our study enoxaparin is frequently prescribed to Acute coronary syndrome patients, coronary artery disease patients, and AAMI to reduce the risk of bleeding complications.
- According to our study 70% of the males over the age of 50 are more prone to coronary artery disease and Acute coronary syndrome when compared with females and to reduce the bleeding complications LMWH is prescribed.

CONCLUSION:

- Based on the above observations and according to literature and the prospective observational study performed LWMH like enoxaparin is best drug of choice and can be frequently used with reduced side effects like bleeding complication and easy administration in outpatients like patients suffering with cancer, coronary artery disease, atrial fibrillation, Acute coronary syndrome, AAMI compared to other anticoagulants like warfarin. There were no much adverse effects seen during the course of treatment. Most of the patients under observation under these specific conditions were given enoxaparin and were found to be effective. Eventually, based on all the observational studies, we conclude that ENOXAPARIN is more efficacious than other anticoagulants like warfarin, fondaparin and others in the treatment of bleeding complications and DVT.

ETHICS AND CONSENT:

Permission was obtained from the ethics committee. Upon receiving the informed consent form, all patients who meet the study criteria were included in the study. All the relevant and necessary data was collected from patient case reports.

CONFLICT OF INTEREST : None

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