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Role of low molecular weight heparin in preventing deep vein thrombosis in elderly patients with hip fracture

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Abstract
Background: Deep vein thrombosis is one of the most prevalent medical problems today, with an annual incidence of 80 cases per 100,000. Lower-extremity DVT is the most common venous thrombosis, with a prevalence of 1 case per 1000 population
Objective: to study the role of low molecular weight heparin i.e. injection enoxaparin in preventing deep vein thrombosis in elderly hip fracture patients.
Methodology: the present study was conducted in department of orthopedics, yashoda super speciality hospital, malakpet, Hyderabad. Forty elderly Patients of hip fracture presenting to outpatient department and emergency department of orthopedics during the period from May 2010 to august 2011 was included in this study.
Results: Out of 40 patients 23 (57.5%) had fracture neck femur and 17(42.5%) intertrochanteric fracture. The incidence of DVT in hip fracture patients with thromboprophylaxis by this study is 20%, of which 6(26.08%) patients had fracture neck femur and 2(11.76%) had intertrochanteric fracture. 1 patient had wound hematoma and 1 patient had minor wound bleeding. only 2(25%) out of 8 patients was symptomatic (leg pain, oedema) and remaining 6(75%) were asymptomatic.
Conclusion: Low molecular weight Heparin drugs are better in preventing deep vein thrombosis with very less complications.

Keywords: Low molecular weight Heparin, deep vein thrombosis, fracture neck femur, intertrochanteric fracture, thromboprophylaxis

Introduction
Early recognition and appropriate treatment of DVT and its complications can save many lives. The goals of pharmacotherapy for DVT are to reduce morbidity, prevent post thrombotic syndrome (PTS), and prevent PE. The primary agents include anticoagulants and thrombolytics [1].
LMWHs are manufactured when standard heparin is treated by various enzymatic or chemical methods to select those lower molecular-weight moieties that contain the active ATIII binding site. The average molecular weight of fractionated heparin is 4500 d in comparison to the usual 15,000 d. The molecular-weight threshold under which anti-factor Xa activity is maximized is 5400 d.
The polysaccharide side chain of the heparin molecule is decreased from 18 U to approximately 13 U. As the length of the side chain is decreased, the ability of the molecule to prolong the aPTT is lost, but the ability to complex with ATIII is retained. LMWHs do not require monitoring of either aPTT or INR. [2].
A comparison study by McGarry and colleagues of outcomes of thromboprophylaxis between a LMWH (enoxaparin) and UFH revealed a 74% lower incidence of venous thromboembolism (VTE) in the LMWH group. No significant difference in side effects, deaths in the hospital, or economics was noted.
Critical evaluation of the existing evidence is necessary to identify valid methods of managing VT and uncover the area in which knowledge is limited or ancedotal, with the hope that my research study will provide some more definitive answers. [3] The objective of present study was to study the role of low molecular weight heparin i.e. injection enoxaparin in preventing deep vein thrombosis in elderly patients with hip fracture.

Materials & Methods

the present study was conducted in department of orthopedics, yashoda super speciality hospital, malakpet, Hyderabad. Forty elderly Patients of hip fracture presenting to outpatient department and emergency department of orthopedics during the period from May 2010 to august 2011 was included in this study. Approval for study was passed from the institutional board of study meeting

All the patients are thoroughly explained regarding nature of study, written informed consent taken and then included in the study. In our study fracture neck femur includes both intracapsular and extra capsular fracture neck femur patients.

Inclusion criteria

Patients with fracture hip aged more than 60 years and both sex

Exclusion criteria

1. Patients with fracture hip younger than 60 years 2. Patient with polytrauma 3. Patients with previous history of DVT 4. Noncompliant patients

According to our protocol all patient on admission were started with prophylactic anticoagulation with injection enoxaparin s.c. 40mg once daily within 24 hours of admission and continue for 2 weeks. We followed ACCP recommendations for DVT prophylaxis in hip fracture patients.

This is withheld 12 hours before surgery and started 12 hours after surgery. Colour Doppler USG was performed on 1st day on admission, 5th and 14th post-operative day.

In some patients those who discharged before or near 14th post-operative day we did investigation on 12th and 13th day also, but those who got discharged. Early we called them back on 14th day for colour Doppler.

All patients on admission were thoroughly evaluated, major surgical profile send, physicians and cardiology fitness for surgery taken and were posted for surgery next day.

Major surgical profile includes complete blood picture, blood urea, serum creatinine, blood sugar, serum electrolytes, blood group and Rh factor, ECG chest x ray, HIV, HBsAg, HCV, urine routine, BT, CT, PT, aPTT.2D-echo was done as per cardiologist advice. Serial colour Doppler findings and other parameters were recorded using standard proforma.

Data and results so obtained were tabulated and analysed using Microsoft excel spread sheet, software of M S OFFICE 2007.

Results

In the present study, number of patients in 60-70 years age group were 27(67.5%), 70-80 years age were 11(27.5%) and >80 years were 2(5%). Half of the patients were male and half were female. In this present study out of 40 patients 23 (57.5%) had fracture neck femur and 17(42.5%) intertrochanteric fracture. In the present study, out of 40 patients who received thromboprophylaxis 8 had DVT. The incidence of DVT in hip fracture patients with thromboprophylaxis by this study is 20%, of which 6(26.08%) patients had fracture neck femur and 2(11.76%) had intertrochanteric fracture.

In this present study 1 patient had wound hematoma and 1 patient had minor wound bleeding (table 1). In this present study only 2(25%) out of 8 patients was symptomatic (leg pain, oedema) and remaining 6(75%) were asymptomatic. Table 2

Table 1: types of complications in our study

Total no of cases	complications
38	No complication
1	Wound haematoma
1	Wound bleeding

Table 2: Incidence of symptomatic and asymptomatic pateints in DVT positive cases in our study

Total no of positive cases	Asymptomatic	Symptomatic
8(100%)	6(75%)	2(25%)

Discussion

In the present study, out of 40 patients who received thromboprophylaxis 8 had DVT. The incidence of DVT in hip fracture patients with thromboprophylaxis by this study is 20%, of which 6(26.08%) patients had fracture neck femur and 2(11.76%) had intertrochanteric fracture. In the present study thromboprophylaxis with enoxaparin was used in all patients and colour Doppler was used as a modality for detection of DVT.

Similar study done by Dhillon *et al* [4] reported the incidence of DVT as also 62.5% with no thromboprophylaxis. Out of 88 patients 55(62.5%) developed DVT. Of which 26(76.5%) patients had TKR, 9(14.%) THR and 20(50%) had fracture neck femur. In this study venogram was used as a modality to detect DVT.

Study done by Ashutosh M P [5] *et al* reported the incidence of DVT as 7.2% without thromboprophylaxis. Out of 125 patients 9(7.2%) developed DVT. Colour Doppler used as modality to diagnose DVT.

Study done by Rajagopalan N *et al* [6] reported the incidence of DVT as 7.8% with thromboprophylaxis. Out of 102 patients 8 developed DVT. Dalteparin sodium (5000iu) was used as a thromboprophylactic agent. Colour Doppler was used as a modality to diagnose DVT.

In this present study 1 patient had wound hematoma and 1 patient had minor wound bleeding. Study done by S agarwala *et al* [1] 1 patient in thromboprophylaxis group had wound hematoma and 2 patients in non thromboprophylaxis group had wound hematoma. This shows safety of thromboprophylaxis. But study done by Rajgopalan N [6] *et al* showed 6 patients had major bleeding and 6 had minor bleeding.

There was no case of major bleeding in our study, which warranted termination of chemoprophylaxis. There was no case of pulmonary embolism in our study. There were no deaths in our study.

In this present study only 2(25%) out of 8 patients was symptomatic (leg pain, oedema) and remaining 6(75%) were asymptomatic. Study done by S agarwala [1] venogram detected DVT in 41.4% of asymptomatic patients. Study done by Dhillon [4], out of 55 patients with DVT, 36 was asymptomatic. Study done by Bhagwat A S *et al* [7] out of 31 patients with DVT 11(35%) were symptomatic and 20(65%) were asymptomatic. Study done by Ashutosh M P *et al* [5] out of 9 patients with DVT only 2(22%) were symptomatic and 7(78%) were asymptomatic. Hence asymptomatic DVT is more common.

Conclusion

Low molecular weight Heparin drugs are better in preventing deep vein thrombosis with very less complications. The incidence of DVT in fracture neck of femur patients even in

India is high hence thromboprophylaxis is essential. Indian data regarding the incidence of DVT and duration of thromboprophylaxis have been heterogeneous and conflicting. Trails involving larger no of patients in future are required.

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