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A COMPARATIVE STUDY OF EFFECT OF HEPARIN VERSES ENOXAPARIN IN DIAGNOSED CASES OF DEEP VEIN THROMBOSIS.

Pharmacology

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ABSTRACT

Deep vein thrombosis is a serious complication of inactivity of bed ridden patients following major abdominal or orthopaedic surgery .It may occur in patients of paralysis .For treatment thrombectomy or drug therapy is available . Among drug therapy, Unfractionated heparin or enoxaparin (Low Molecular Weight Heparin) is used. In this randomized study we had given Unfractionated heparin to 38 patients and Enoxaparin to 30 patients. Observation was shown in tables and result was discussed.

KEYWORDS

Deep Vein thrombosis, heparin, LMWH, Enoxaparin.

INTRODUCTION

Deep Vein Thrombosis is the formation of blood clot in a deep vein ,most commonly in the legs and pelvis. DVT can cause symptoms like pain, swelling, redness and or enlarged veins in the affected area. Sometimes it has no symptoms. It is a sequelae of long duration of bed ridden patients. Predisposing factor of DVT includes inheriting a blood clotting disorder, prolonged bed rest such as during a long hospital stay or paralysis, pregnancy, oral contraceptive pills or hormone replacement therapy ,being overweight or obese, cancer or smoking.

For treatment of DVT, Heparin (Unfractionated heparin) or Low Molecular Weight Heparin for example Enoxaparin, Dalteparin, Tinzaparin etcetera are used.

Heparin is a naturally occurring heterogenous mixture of sulfated mucopolysaccharides (glucosaminoglycan) is an anticoagulant .It binds to endothelial cell surfaces and a variety of plasma proteins. Its biological activity is depended upon the endogenous anticoagulant antithrombin. Antithrombin inhibits clotting factor proteases especially thrombin (IIa), IXa, Xa by forming equimolar stable complexes with them. In the absence of heparin, these reaction are slow ,in the presence of heparin they are accelerated 1000 fold. High Molecular Weight fraction of heparin with high affinity for antithrombin markedly inhibit blood coagulation by inhibiting all three factors especially thrombin and factor Xa. Unfractionated heparin has a molecular weight of 5000-30000.

In contrast , the shorter chain low molecular weight fraction of heparin inhibit factor Xa, but have less effect on thrombin than the HMW species. Low Molecular Weight Heparin are prepared by fractionation of native heparin, more homogeneous molecularly,with molecular weight between 4000 and 6500 and have 15—17 saccharide chains, given subcutaneously once or twice daily. They have longer duration of action (t ½ 4h).They have predictable anticoagulant effect because they bind less avidly to cells and to heparin binding proteins. They interact less with platelets and lead to fewer bleeding episodes.

OBJECTIVE

1. To compare clinical efficacy and pharmaco-economics of Low Molecular Weight Heparin (enoxaparin) and Unfractionted Heparin.

METHODS

This is a prospective randomized study done at Rajendra Institute of Medical Science, Ranchi, Jharkhand, India. Patients of Deep Vein Thrombosis (n=68) were randomly given the treatment either Unfractionated Heparin(UFH)(a total of 38 patients) or ENOXAPARIN (a total patients of 30 were given). DVT Patients admitted in the department of surgery, RIMS, Ranchi from September 2017 to February 2020(=30 months) were taken for study. Enoxaparin was given for treatment of DVT at the dose of 100 units/kg every 12 hours till the thrombus disappear sonologically. Lab diagnosis of Prothrombin Time, INR are not required.

A bolus of I.V. injection of 10,000 units of heparin is given followed by I.V. infusion of 5000 units every 6 hour. Dose of heparin in children was 100 U /kg initially and then 50 U /kg every 6 hours. Platelet count was done at regular interval .Whole blood clotting time was kept at 2-3 times the normal value . Activated Partial Thromboplastin Time (aPPT) was kept at 11/2 -2 times the normal.

Size of deep vein thrombosis was assessed by Colour Doppler . Colour Doppler was performed on day 1 for base line evaluation and repeated on 7th day then on 14th day, and on 21st day after initiation of drug treatment. During discharge, patients were advised tablet Warfarin 10 mg /day for 15 days and called for follow up.

EXLCUSION CRITERIA-

1. No arterial cases were considered for study.
2. A known hypersensitivity to heparin or Enoxaparin.
3. Patients of kidney diseases, peptic ulcer or bleeding disorders were excluded in this study.

INCLUSION CRITERIA-

Only venous thrombosis cases were taken into consideration.

OBSERVATION-

TABLE-1 SIGNS AND SYMPTOMPS

SIGNS AND SYMPTOMS	MALE PATIENTS	FEMALE PATIENTS	TOTAL PATIENTS
SWELLING OF AFFECTED PART	49	11	60
LINEAR REDNESS ON THE AFFECTED LIMB	41	6	47
TENDERNESS	54	14	68
CRAMPING PAIN	32	9	41
RAISED SKIN TEMPERATURE	54	14	68

TABLE-2 AGE DISTRIBUTION

AGE GROUP	MALE	FEMALE	TOTAL	%
0----10	0	1	1	1.47
11---20	0	0	0	0
21----30	1	0	1	1.47
31-----40	6	2	8	11.76
41------50	13	3	16	23.53
51-------60	14	5	19	27.94
61--------70	18	3	21	30.88
71---------80	2	0	2	2.95

TABLE ---3 EFFECT OF TREATMENT

FACTORS	HEPARIN	ENOXAPARIN
COST BENEFIT RATIO	GOOD	LOW
ADVERSE DRUG REACTION	NONE	NONE
LENGTH OF THERAPY	LONGER	SHORT

PATIENT COMPLIANCE	GOOD	VERY GOOD
REDUCTION IN SIZE OF THROMBUS	SLOW	FAST

RESULT

All patients had signs of raised skin temperature and tenderness. Sixty patients had swelling of affected limb. Linear redness on affected part was present in 47 patients. Cramping pain was present in 41 patients .According to age wise distribution , maximum (30.88%) of the patients belongs to 61 to 70 years group. The minimum patient(1.47%)were from age group 0 to 10 and age group 21 to 30.

There were no deaths from pulmonary embolism or bleeding complications. Thrombus reduction occurred in 6 patients on day 7, in 14 patients on day 14 and in 18 patients on day 21 who were treated with heparin. Thrombus was reduced in 8 patients on day 7 ,in 15 patients on day 14 and in 7 patients on day 21 in the patient group who were treated with Enoxaparin. Cost benefit ratio was good for heparin. No any adverse drug reaction noted. Length of therapy was more in patients treated with UFH. Patient compliance was better for Enoxaparin. Average days needed for reduction of thrombus size is 10 days in cases of Enoxaparin treated patients and in cases of UFH it took 14 days.

CONCLUSION

Given the current difference in cost , prophylaxis with low dose heparin remains the preferred drug. For large size thrombus enoxaparin should be advised so that reduction in size of thrombus will took lesser time. Otherwise for average size thrombus it is better to use heparin. Prolonged thromboprophylaxis with low molecular weight heparin for abdominal or pelvic surgery was advised by Seth Felder et all. The clearance of LMWH is directly proportional to the creatinine clearance (CrCl). A study says Cr Cl<30 ml /minute was associated with increased incidence of major haemorrhage in patients treated with Enoxaparin. Based on this ,UFH should be the first choice agent for therapeutic anticoagulation for patients with Cr Cl under 30ml/minute.

CONFLICT OF INTEREST –There is no confict of interest.

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