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Original Research Paper

Hematology

HEPARIN INDUCED THROMBOCYTOPENIA (HIT) -A CLINICAL UPDATED REVIEW

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ABSTRACT HIT is characterized by development of thrombocytopenia due to administration of heparin. HIT predisposes the abnormal blood clot because platelets release microparticles that activates thrombin. HIT is caused by formation of abnormal antibodies. The blood investigation helps to identify the antibodies. The treatment is done by stopping heparin treatment and giving anticoagulant. The present article describes the cause, incidence, diagnosis and treatment of HIT.

KEYWORDS : Heparin induced thrombocytopenia, platelet factor 4, heparin

INTRODUCTION

Heparin is drug of choice for thromboprophylaxis in cardiovascular, neurological, atrial fibrillation, peripheral vascular disease, dialysis and extra corporal circulation. On the other hand, heparin can induce thrombocytopenia, this is termed as heparin induced thrombocytopenia.[1]

HIT is immune mediated adverse drug reaction caused by the emergent of antibodies which activate platelets in the presence of heparin. There are two forms of HIT type I and type II. HIT type I is non immunologic response to heparin treatment caused due to interaction between heparin and circulating platelets cause platelet clumping and HIT type II is immune mediated linked with a risk of thrombosis.[2,3]

Incidence of HIT

- Patient who are receiving the heparin dose, among them 8% patient develop HIT antibodies.
- HIT type I affect 10% patients with in 48-72 hours after initiation of heparin treatment.
- Risk factors for HIT
- Malignancy, female are more prone to thrombotic stroke as an result of HIT.[4,5]

Pathology

Heparin administration activates platelets antibodies formation, the heparin binds with Platelet factor 4, undergoes conformational change, become immunogenic leads to heparin PF4 antibodies, which in turn activates platelets containing 1Fc receptor, Fc RIIa which causes the release of prothrombotic platelet derived microparticles, platelet consumption and thrombocytopenia. The micro plate let scauses thrombin generation, the antigen-antibodies complex lead to endothelial tissue injury.[7,9]

Clinical findings of HIT

- HIT enlargement of previous diagnosed blood clot, arterial thrombosis lead to stroke, myocardial infarction, acute leg ischemia, deep vein thrombosis, pulmonary embolism.[6,8]
- Patients receiving the heparin therapy may have fever, chills, hypertension, tachycardia, dyspnea, chest pain, skin rashes, red spots.
- Fall in the platelets count after start of heparin treatment 5-14 days, HIT can be rapid or delayed, patients with history of PF4 heparin antibodies, platelets count fall rapidly.

Diagnosis of HIT

- Normal platelet count before beginning of heparin treatment.
- The 4T's of HIT developed by Warkentin recommended by British hemostasis and thrombosis task force for standards in hematology includes thrombocytopenia, thinning of the platelet count fall, thrombosis or other sequelae, others cause for thrombocytopenia.
- HIT antibodies testing and immunoassays, heparin PF4 antibody testing.
- Functional test to measure platelet activity in serum and heparin induced platelet aggregation. The serotonin release assay and flow cytometric assay detects microparticle release.
- ELISA used to detect the HIT antibody that bind to PF4 heparin complex.[10,11]

Treatment of HIT

- The treatment of HIT is achieved as 4T's scoring system,[14] which help in categorizing as low risk HIT, intermediate and high risk of HIT.
- Anticoagulatants are used for the management of HIT.

Approaches for the management of HIT[12]

1. Stopping the heparin treatment immediately.
2. Sample of blood sent for platelet antibodies
3. Anticoagulation treatment begin
4. Monitor for thrombotic event, platelets
5. On recovery administration of warfarin.

- The anticoagulants used are Danaparoid, Lepirudin and Argatroban act by inhibiting of thrombin activity and thrombin generation.
- Prostacyclin analogues inhibit platelet aggregation.
- Plasmapheresis help to reduce the platelet antibodies.

Prevention of HIT

1. By limiting heparin to less than 5days
2. Using low molecular heparin as thromboprophylaxis
3. Monitoring platelet count 4 to 14 days
4. Heparin flushing

Prevention of HIT begins as soon as the heparin treatment is started by following the preventive measures the antibodies PF4 can be brought under control.[15]

CONCLUSION

Heparin induced thrombocytopenia is an immune mediated severe life-threatening complication, heparin is used for curative purpose but when the adverse effect develops it may leads to bleeding, thrombocytopenia and red spot. Treatment of choice is direct thrombin inhibitor lepirudin, danaparoid and argatroban.

Conflicts of Interest - None to Declare

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