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The Bulletin from the Clinical Pharmacist

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Pharma today

Tirofiban

Introduction: Tirofiban was introduced in 1998 by Merck and approved by the FDA. This is the first antiplatelet drug derived from a snake venom protein. Tirofiban is a fast-acting, highly selective, low-molecular-weight, non peptide glycoprotein IIb/IIIa receptor inhibitor with a short half-life that allows bleeding time to revert to normal within approximately 3 hours after its administration is stopped.

Glycoprotein IIb/IIIa receptor is a transmembrane integrin complex found on platelets, composed of two sub units (αIIb and β3). It is the principal receptor responsible for platelet aggregation by binding fibrinogen and von willebrand factor, which crosslinks platelets to form a blood clot. Upon platelet activation, a calcium dependent conformational changes allows this receptor to bind to fibrinogen, facilitating platelet "Stickiness" and clot formation. This receptor plays a crucial role in thrombus formation in blood vessels.

Mechanism of Action: Tirofiban is an antiplatelet drug that prevents platelets from binding (adhering) to fibrinogen and aggregating. It is a reversible, competitive Inhibitor that acts as the final common pathway for platelet aggregation. This action can help reduce the formation of new blood clots and potentially improve blood flow to the affected area of the brain and heart.

Indications: Prevention of thrombotic cardiovascular events in Acute Coronary Syndrome (ACS). Often used with aspirin and unfractionated heparin during percutaneous coronary intervention (PCI). Also used in ischemic strokes.

Renal Adjustment: For CrCl ≤ 60ml/min: IV Loading dose: 25 mcg/kg administered over 5 minutes or less, Maintenance infusion: 0.075 mcg/kg/min continued for up to 18 hours.

Contraindication: Acute internal bleeding, Thrombocytopenia, Severe uncontrolled Hypertension and history of intracranial hemorrhage.

Storage and Stability: Store at 20-25^0 C, protect from light; Use within recommended time after dilution.

Dosage and Administration:

Indication	Dosing
Non-ST elevation myocardial infarction ST-elevation myocardial infarction	Loading dose: 25 mcg/kg administer over 5 minutes. Followed by maintenance infusion: 0.15 mcg/kg/minute continued for Up to 18 hours.
Stable ischemic heart disease	Loading dose: 25 mcg/kg administer over 5 minutes. Followed by maintenance infusion: 0.15 mcg/kg/minute continued for 48 hours.
Ischemic Stroke Management	Initial infusion of 0.4 µg/kg body weight/minute over 30 min followed by a continuous infusion of 0.1 µg/kg body weight/minute for 24 hrs

Conclusion:

- In patients with non-cardioembolic ischemic stroke, ACS and Myocardial Infarction symptom onset, Tirofiban decreases the risk of early neurological and cardiological deterioration.
- Monitor platelet count at baseline, 6 hours after starting therapy, and daily thereafter. Discontinue if platelets drop <90000/mm3 or if bleeding occurs; also monitor hemoglobin, hematocrit, and signs of bleeding.
- Proper patient selection, renal dose adjustments, and bleeding risk monitoring are key to maximizing therapeutic benefit while minimizing complication.