Gloucestershire Hospitals
NHS Foundation Trust

Tirofiban in Acute Coronary Syndrome

Indications:

1. Tirofiban is indicated for the prevention of major cardiovascular events in adult patients presenting with acute coronary syndromes without ST elevation (NSTE-ACS) with the last episode of chest pain occurring within 12 hours and with ECG changes and/or elevated cardiac enzymes.

   Consider prescribing tirofiban for NSTE-ACS patients who have persisting chest pain and a GRACE score of >3% (predicted 6 month mortality) GRACE ACS Risk Model

2. Tirofiban is also indicated for the reduction of major cardiovascular events in NSTE-ACS patients planned to undergo PCI within the first 4 hours of diagnosis or STEMI patients undergoing primary PCI.

Additional drugs:

Tirofiban should be given in combination with fondaparinux (or enoxaparin), aspirin and clopidogrel (or ticagrelor). Patients undergoing PCI should receive unfractionated heparin.

Monitoring:

Discontinue Tirofiban if serious or uncontrollable bleeding occurs, thrombolytic therapy is necessary, if IABP is required, if emergency cardiac surgery is necessary.

Platelet count, haemoglobin and haematocrit should be determined before using tirofiban, within 2-6 hours of starting therapy and daily thereafter.

Side effects:

Bleeding (risk increases with declining renal function), nausea, fever, headache, reversible thrombocytopenia

Contra-indications:

- History of stroke within 30 days or any history of haemorrhagic stroke
- Known history of intracranial disease
- Active or recent (within 30 days) clinically relevant bleeding
- Malignant hypertension
- Recent trauma or major surgical intervention (within the last 6 weeks)
- Thrombocytopenia (platelets < 100,000 per mm^3)
- Clotting disturbances (PT>1.3 times normal, INR >1.5)
- Severe liver failure

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Tirofiban is also not recommended in the following conditions where an increased risk of bleeding is suspected:

- Traumatic CPR, organ biopsy or lithotripsy within the last two weeks
- Severe trauma or major surgery >6 weeks but <3 months previously
- Active peptic ulcer within the last three months
- Hypertension (180/110 mmHg)
- Acute pericarditis
- Active or a known history of vasculitis
- Aortic dissection
- Haemorrhagic retinopathy
- Occult blood in stool or haematuria
- Concurrent use of drugs (e.g. warfarin, dextran) which increase bleeding risk

Use tirofiban with caution in the following conditions/ patient groups:

- Recent clinically relevant bleeding (<1 year)
- Puncture of a non-compressible vessel within the previous 24 hours
- Severe acute or chronic heart failure
- Cardiogenic shock
- Mild to moderate liver insufficiency
- Platelets <150,000/mm^3
- Haemoglobin <11 g/dl or haematocrit <34%
- Elderly (> 65 years plasma clearance 19-26% lower)
- Low body weight
- Active or known history of vasculitis

Additional Information:

Half-life of tirofiban is about 2 hours in patients with coronary artery disease and is increased by over 50% in patients with a creatinine clearance of <30ml/minute. Dose should be halved if eGFR < 30 mL/minute/ 1.73 m^2.

Administration of Tirofiban (Aggrastat® Solution for Infusion)

Presentation:
Pre-diluted (ready to use) 250ml bag containing tirofiban 50mcg per ml.

Dosage:

1. NSTE-ACS patients with persisting chest pain and GRACE score >3% (not planned for urgent angiogram).

    - Initially 400 nanograms/kg/minute for 30 minutes, then 100 nanograms/kg/minute for at least 48 hours (continue during and for 12–24 hours after percutaneous coronary intervention), maximum duration of treatment 108 hours. (**TABLE 1**)

2. STEMI patients undergoing primary PCI or NSTE-ACS patients planned for urgent PCI

    - 25 micrograms/kg, to be given over 3 minutes at start of percutaneous coronary intervention, then (by intravenous infusion) 150 nanograms/kg/minute for 12–24 hours, maximum duration of treatment 48 hours. (**TABLE 2**)

TABLE 1: Patients NOT planned for urgent angiogram

	Most patients (eGFR >30)		Severe kidney failure (eGFR <30)	
Patient weight (kg)	30 min loading infusion rate (ml/hr)	Maintenance infusion rate (ml/hr)	30 min loading infusion rate (ml/hr)	Maintenance infusion rate (ml/hr)
30-37	16	4	8	2
38-45	20	5	10	3
46-54	24	6	12	3
55-62	28	7	14	4
63-70	32	8	16	4
71-79	36	9	18	5
80-87	40	10	20	5
88-95	44	11	22	6
96-104	48	12	24	6
105-112	52	13	26	7
113-120	56	14	28	7
121-128	60	15	30	8
129-137	64	16	32	8
138-145	68	17	34	9
146-153	72	18	36	9

TABLE 2: Primary PCI / Urgent Angiogram

Patient weight (Kg)	**All patients**	**Most patients (eGFR >30)**	**Severe kidney failure (eGFR <30)**
	Bolus dose (mls) to be given over 3 min during PCI	Maintenance infusion rate (mls/hr)	Maintenance infusion rate (mls/hr)
30-37	17	6	3
38-45	21	7	4
40-54	25	9	5
55-62	29	11	5
63-70	33	12	6
71-79	38	14	7
80-87	42	15	8
88-95	46	16	8
96-104	50	18	9
105-112	54	20	10
113-120	58	21	10
121-128	62	22	11
129-137	67	24	12
138-145	71	25	13
146-153	75	27	13