Anticoagulation: Bivalirudin

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Inclusion criteria:
- Therapeutic indication for DTI management

Exclusion criteria:
- Prophylactic indication for DTI management (i.e., maintaining patency of arterial or central venous catheters or hemodialysis / extracorporeal circuits)

Indications for management:
- Treatment of VTE
- Treatment of arterial thrombosis

Patient with indication for intravenous direct thrombin inhibitor (DTI) management

Bivalirudin considerations for use

Adverse effects:
- Most common event is bleeding; refer to section below for management
- Other: headache, thrombocytopenia, fever

Management of bleeding:
- There is no reversal agent for bivalirudin, but it has a very short half-life (about 25 minutes in patients with normal renal function or up to 60 minutes in patients with severe renal dysfunction (CrCl < 30 mL/min)).
- Discontinuation of the infusion should terminate the anticoagulant effect.

Drug Interactions:
- Increased potential for hemorrhage:
  - Anticoagulants: Heparin, Vitamin K antagonists, direct acting oral anticoagulants
  - Thrombolytic agents: alteplase, streptokinase, urokinase
  - GP IIb/IIIa inhibitors: abciximab, eptifibatide, tirofiban
- Drugs affecting platelet function: aspirin, NSAIDs, dipyridamole, clopidogrel, ticlodipine, cilostazol
- Complementary/alternative medications known to have the potential to increase bleeding risk: garlic, ginger, ginkgo biloba, fenugreek, St. John's Wort

Other Considerations:
- For recommendations regarding transitioning between anticoagulants, contact hematology.

Guidance for holding prior to procedures:
- Hold bivalirudin infusion 2 hours prior to any invasive procedure and restart 12-24 hours post-procedure depending on bleeding risk.

Initiation and Maintenance

- Consult Coagulation Service
- Obtain baseline CBC, PT, aPTT, SrCr
- Initiate bivalirudin infusion:
  - If CrCl > 60 mL/min, start at 0.3 mg/kg/hr
  - If renal dysfunction or increased bleeding risk, start at 0.1 mg/kg/hr
- Adjust rate of infusion to maintain hPTT* at 60-90 seconds using Table 1
  - To place an order for hPTT, order aPTT-one time order and select appropriate field for line draw (i.e., yes for central line or no for venipuncture or PICU/CICU heparin free line) and under anticoagulant therapy select bivalirudin. This will aid the lab in determining whether or not to heparin neutralize the sample.
  - Obtain hPTT level 2 to 4 hours after initiation and every change in infusion rate
  - Obtain hPTT at least daily once in therapeutic range

*Note: hPTT is only reported if the line draw is yes and the aPTT is above the reference range (to rule out heparin contamination); use aPTT result to adjust the rate of infusion when hPTT is not reported
*Note hPTT is reported as Heparin Neutralized aPTT

Monitoring

- Monitor for any signs or symptoms of bleeding. If bleeding is concerning, please discontinue bivalirudin infusion and contact coagulation team to discuss plan of care.
- Note mild prolongation of PT may be expected in addition to PTT
- Total duration of therapy depends on indication for use

Abbreviations:
PT = prothrombin time
aPTT = activated partial thromboplastin time
hPTT = heparinase neutralized partial thromboplastin time
VTE = venous thromboembolism

QR code for mobile view

Contact: EvidenceBasedPractice @cmh.edu

Link to Synopsis

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