Direct Thrombin Inhibitors

Direct thrombin inhibitors are indicated for heparin-induced thrombocytopenia, nonvalvular atrial fibrillation, and venous thromboembolism. Drug names include dabigatran, bivalirudin, and argatroban. The mechanism of action of these drugs involves inhibition of thrombin and subsequent prevention of fibrin and platelet aggregation. Reversal agents include idarucizumab and activated prothrombin complex concentrate. The main side effect of direct thrombin inhibitors is bleeding.



PLAY PICMONIC

Indications

Heparin Induced Thrombocytopenia (HIT)
Hippie-heron HIT Trombone-side-toe-peanut
Direct thrombin inhibitors can be used to treat HIT (Heparin induced thrombocytopenia). HIT is a syndrome that occurs after administration of heparin and is characterized by antibodies to platelet factor 4. These complexes activate platelets and promote a hypercoagulable state.

Nonvalvular Atrial Fibrillation
Nun-valve Atrial-heart and Alarm-clock
Atrial fibrillation (Afib) is an important risk factor for stroke. Valvular Afib and nonvalvular Afib are caused by different factors. Nonvalvular AFib is associated with high blood pressure. Valvular AFib is associated with heart valve disorders or prosthetic heart valves. Direct thrombin inhibitors can be given to patients to mitigate their risk of thrombus formation.

Venous Thromboembolism
Vine Trombone-Elmo
A blood clot that begins in a vein is called a venous thromboembolism (VTE). VTE disorders include deep vein thrombosis (DVT) and pulmonary embolism (PE). DVT occurs when a blood clot forms in a deep vein and is commonly seen in the lower extremities. PE occurs when a DVT throws off an embolus which travels to the lungs and blocks its blood supply.

Drug Names

Dabigatran
Da-big-train
Dabigatran is a direct thrombin inhibitor commonly used for prophylaxis and treatment of patients with atrial fibrillation or hypercoagulability.

Bivalirudin
Beaver-reuben
Bivalirudin is commonly used to prevent blood clots in people with severe angina and those undergoing angioplasty.

Argatroban
Argyle-turban
Argatroban is a direct thrombin inhibitor that is commonly used for treatment of patients experiencing HIT (Heparin induced thrombocytopenia). Argatroban may also be used for patients undergoing percutaneous coronary interventions.

Mechanism of Action

Sign up for FREE at picmonic.com

Inhibition of Thrombin

Trombone in Inhibiting-chains

Direct thrombin inhibitors work by reversibly binding to the catalytic thrombin active site. Several coagulation factors will then be inhibited including factors V, VIII, and XIII. This also prevents the formation of fibrin and platelet aggregation.

Antidotes

Idarucizumab

I-dare-you-scissor-mob

In case of uncontrolled bleeding from the use of dabigatran, a reversal agent drug like idarucizumab can be administered. Idarucizumab neutralizes the activity of dabigatran by binding free and thrombin-bound dabigatran.

Activated Prothrombin Complex Concentrate

Activated Pro-trombone

aPCC stands for Prothrombin complex concentrate. This agent consists of blood clotting factors II, IX, and X. It may be used to reverse the effect of direct thrombin inhibitors. In the case that idarucizumab is not readily available, consider using PCC and/or antifibrinolytics such as tranexamic acid.

Side Effects

Bleeding

Blood

Bleeding is the major side effect from the usage of direct thrombin inhibitors.

Sign up for FREE at picmonic.com