

SUBJECT : PHARMACOTHERAPEUTICS III

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ASSIGNMENT TOPIC : INFLAMMATORY BOWEL DISEASE

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**VENOUS THROMBOEMBOLISM**

**DEFINITION:**

Venous thromboembolism (VTE), a term referring to blood clots in the veins, is an underdiagnosed and serious, yet preventable medical condition that can cause disability and death. Venous thromboembolism (VTE) is categorized as deep venous thrombosis (DVT) and pulmonary embolism (PE).

**EPIDEMIOLOGY**

Venous thromboembolism (VTE) occurs for the first time in approximately 100 persons per 100,000 each year in the United States, and rises exponentially from <5 cases per 100,000 persons <15 years old to approximately 500 cases (0.5%) per 100,000 persons at age 80 years.

**SYMPTOMS**

VTE includes deep vein thrombosis (DVT), when a blood clot forms in a deep vein, usually in the leg. And it includes pulmonary embolism (PE), when the clot breaks off and travels from the leg up to the lungs. DVT and PE are serious, life-threatening conditions that require immediate medical attention.

DVT mainly affects the large veins in the lower leg and thigh, almost always on one side of the body at a time. The clot can block blood flow and cause:

* Leg pain or tenderness of the thigh or calf
* Leg swelling (edema)
* Skin that feels warm to the touch
* Reddish discoloration or red streaks.

PE, or pulmonary embolism, can be fatal and occurs when the DVT breaks free from a vein wall and blocks some or all of the blood supply to the lungs, causing:

* Unexplained shortness of breath
* Rapid breathing
* Chest pain anywhere under the rib cage (may be worse with deep breathing)
* Fast heart rate
* Light headedness or passing out.

**CAUSES**

VTE occurs in the veins that carry blood to your heart. A deep vein thrombosis may occur if the flow of blood slows down in your body's deep veins, if something damages the blood vessel lining, or if the makeup of the blood itself changes so that blood clots form more easily

The main causes of DVT are damage to a vein from surgery or trauma and inflammation due to infection or injury.

**PATHOPHYSIOLOGY**

**RISK FACTORS**

Many things can increase your risk of developing DVT. The more risk factors you have, the greater your risk of DVT. Risk factors for DVT include:

* **Age.** Being older than 60 increases your risk of DVT, though it can occur at any age.
* **Sitting for long periods of time, such as when driving or flying.** When your legs remain still for hours, your calf muscles don't contract. Muscle contractions normally help blood circulate.
* **Prolonged bed rest, such as during a long hospital stay, or paralysis.** Blood clots can form in the calves of your legs if your calf muscles don't move for long periods.
* **Injury or surgery.** Injury to your veins or surgery can increase the risk of blood clots.
* **Pregnancy.** Pregnancy increases the pressure in the veins in your pelvis and legs. Women with an inherited clotting disorder are especially at risk. The risk of blood clots from pregnancy can continue for up to six weeks after you have your baby.
* **Birth control pills (oral contraceptives) or hormone replacement therapy.** Both can increase your blood's ability to clot.
* **Being overweight or obese.** Being overweight increases the pressure in the veins in your pelvis and legs.
* **Smoking.** Smoking affects blood clotting and circulation, which can increase your risk of DVT.
* **Cancer.** Some forms of cancer increase substances in your blood that cause your blood to clot. Some forms of cancer treatment also increase the risk of blood clots.
* **Heart failure.** This increases your risk of DVT and pulmonary embolism. Because people with heart failure have limited heart and lung function, the symptoms caused by even a small pulmonary embolism are more noticeable.
* **Inflammatory bowel disease.** Bowel diseases, such as Crohn's disease or ulcerative colitis, increase the risk of DVT.
* **A personal or family history of DVT or PE.** If you or someone in your family has had one or both of these, you might be at greater risk of developing DVT.
* **Genetics.** Some people inherit genetic risk factors or disorders, such as factor V Leiden, that make their blood clot more easily. An inherited disorder on its own might not cause blood clots unless combined with one or more other risk factors.
* **No known risk factor.** Sometimes, a blood clot in a vein can occur with no apparent underlying risk factor. This is called an unprovoked VTE.

**TREATMENT**

Pharmacological interventions for both prevention and treatment include unfractionated heparin, low-molecular-weight heparin, selective factor Xa inhibitors, and vitamin K antagonists; nonpharmacological interventions include mechanical measures, such as inferior vena cava filters, graduated compression stockings, and intermittent pneumatic compression devices. Pharmacological interventions interfere with various factors of the coagulation cascade.

**Anticoagulants**

* Anticoagulants (commonly referred to as “blood thinners”) are the medications most commonly used to treat DVT or PE. Although called blood thinners, these medications do not actually thin the blood. They reduce the ability of the blood to clot, preventing the clot from becoming larger while the body slowly reabsorbs it, and reducing the risk of further clots developing.
* The most frequently used injectable anticoagulants are
  + Unfractionated heparin (injected into a vein),
  + Low molecular weight heparin (LMWH) (injected under the skin), and
  + Fondaparinux (injected under the skin).
* Anticoagulants that are taken orally (swallowed) include
  + Warfarin,
  + Dabigatran,
  + Rivaroxaban,
  + Apixaban, and
  + Edoxaban.
* All of the anticoagulants can cause bleeding, so people taking them have to be monitored to prevent unusual bleeding.

**Thrombolytics**

* Thrombolytics (commonly referred to as “clot busters”) work by dissolving the clot. They have a higher risk of causing bleeding compared to the anticoagulants, so they are reserved for severe cases.

**Inferior vena cava filter**

* When anticoagulants cannot be used or don’t work well enough, a filter can be inserted inside the inferior vena cava (a large vein that brings blood back to the heart) to capture or trap an embolus (a clot that is moving through the vein) before it reaches the lungs.

**Thrombectomy/Embolectomy**

* In rare cases, a surgical procedure to remove the clot may be necessary.  Thrombectomy involves removal of the clot in a patient with

DVT. Embolectomy involves removal of the blockage in the lungs caused by the clot in a patient with PE.

**NUTRITIONAL CONSIDERATIONS**

DVT is rare in societies in which diets are primarily based on unrefined plant-based foods rather than on animal products or highly refined foods and, as a result, are lower in fat and higher in dietary fiber. The reasons for this association are unclear. However, dietary intake influences factor VIIc, factor VIIIc, and von Willebrand factor, all of which are, in turn, related to the risk for venous thromboembolism.

In addition, low fiber intake is associated with higher activity of plasminogen activator inhibitor-1 (PAI-1), the body’s main inhibitor of fibrinolysis. Low-fat, high-fiber diets, combined with exercise, improve fibrinolysis and may thereby help reduce DVT risk. Some researchers have hypothesized that individuals on low-fiber diets often strain to pass stools, raising intravenous pressures and damaging the valves that facilitate blood return. High-fiber diets help prevent this problem.

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