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DEEP VEIN THROMBOSIS: A Literature Review

Dr.V. Hemavathy M.SC(N), M. A, M. Phil, Ph.D. 1,

Prof.Mrs. Girija Bhaskaran M.SC (N) 2,

J. Mary Ann M.Sc. (N) 3.

1.Principal, Sree Balaji College of Nursing Chrompet, Chennai

2.HOD, Medical and Surgical Nursing Dept, Sree Balaji College of Nursing Chrompet, Chennai

3.M.SC Nursing Sree Balaji College of Nursing, Chrompet

ABSTRACT

The term thrombosis refers to the formation, from constituents of blood, of an abnormal mass within the vascular system of a living animal. When this process occurs within the deep veins, it is referred to as deep vein thrombosis (DVT). An accurate diagnosis of DVT is extremely important to prevent potentially fatal acute complication of pulmonary embolism (PE) and long-term complications of post phlebitis syndrome and pulmonary hypertension. It is also important to avoid unjustified therapy with anticoagulants with associated high risk of bleeding in patients misdiagnosed with the condition. Clinical features are nonspecific; hence new strategies for diagnosing this condition have evolved.

KEY WORDS:

Thrombosis, veins, blood, pulmonary embolism, complications

INTRODUCTION:

DVT or deep vein thrombosis occurs when a blood clot is formed in the deep veins of the patient's body usually legs. The symptoms of DVT or deep vein thrombosis can range from no particular symptoms to severe pain or swell in the leg. It has been seen that deep vein thrombosis develops in case a patient has some medical condition that affects the process of clotting of the blood. In many cases, deep vein thrombosis occurs if a patient does not move for a long time after a surgery or accident when the patient is confined to the bed. VT usually occurs in a deep leg vein, a larger vein that runs through the muscles of the calf and the thigh. It can cause pain and swelling in the leg and may lead to complications such as pulmonary embolism. This is a serious condition that occurs when a piece of blood clot breaks off into the bloodstream and blocks one of the blood vessels in the lungs

DEFINITION:

Deep vein thrombosis is the formation of a blood clot in one of the deep veins of the body within the leg, arm and pelvis, usually in the leg.

INCIDENCE:

The weighted man incidence of first DVT in the whole general population was 5.04 per 10,000 person years. The incidence was similar in males and females and increased dramatically with age from 2-3 per 10 000 person years at age 30-49 to 20 per 10 000 person years at age 70-79. The left leg is the most affected limb and the femoro popliteal location was the most frequent site involved. Iliac dvt occurred in only 13% of the cases. Hormone therapy, immobilization, previous surgery, and malignancy were the most acquired risk factors

CAUSES:

Deep vein thrombosis (DVT) sometimes occurs for no apparent reason**.** However, the risk of developing DVT is increased in certain circumstances.

Inactivity

- having an operation for an inflammatory or abdominal condition, such as Appendicitis
- confined to a bed, unable to walk, or spending a large part of the day in a bed or chair for at least three days

Blood vessel damage

- cancer treatments such as chemotherapy and radiotherapy can increase this risk further
- heart disease and lung disease
- infectious conditions, such as hepatitis
- inflammatory conditions, such as rheumatoid arthritis
- thrombophilia a genetic condition where your blood has an increased tendency to clot
- antiphospholipid syndrome an immune system disorder that causes an increased risk of blood clots

Pregnancy

During pregnancy, blood clots more easily. It's the body's way of preventing too much blood being lost during childbirth. Venous thromboembolism (VTE) DVT and pulmonary embolism affects about one in 100,000 women of childbearing age. DVTs are also rare in pregnancy.

Other causes

Overweight or obese, smoke. dehydrated over 60 particularly if you have a condition that restricts your mobility

Other risk factors during pregnancy include:

- being over 35 years old
- being obese (with a BMI of 30 or more)
- expecting two or more babies

- having recently had a caesarean section
- being immobile for long periods of time
- smoking (find out how to stop smoking)
- having severe varicose veins
- dehydration

PATHOPHYSIOLOGHY:

The process of fibrinolysis, where DVT clots can be dissolved back into the blood, acts to temper the process of thrombus growth. This is the preferred process. The first pathological stage is marked by red blood cells, and the second is characterized by medium-textured fibrin. In arterial thrombosis, blood vessel wall damage is required, as it initiates coagulation but clotting in the veins mostly occurs without any such mechanical damage. The beginning of venous thrombosis is thought to arise from "activation of endothelial cells, platelets, and leukocytes, with initiation of inflammation and formation of micro particles that trigger the coagulation system" via tissue factor. Vein wall inflammation is likely the inciting event. Importantly, the activated endothelium of veins interacts with circulating white blood cells (leukocytes). They release pro-coagulant granules and (NETs) or their components, which play a role in venous thrombi formation. Net components are pro-thrombotic through both the intrinsic and extrinsic coagulation pathways. NETs provide "a scaffold for adhesion" of platelets, red blood cells, and multiple factors that potentiate platelet activation. In addition to the pro-coagulant activities of neutrophils, multiple stimuli cause monocytes to release tissue factor. Monocytes are also recruited early in the process. Tissue factor, via the tissue factor–complex, activates the extrinsic pathway of coagulation and leads to conversion of prothrombin to thrombin, followed by fibrin deposition Platelets are not as prominent in venous clots as they are in arterial ones, but they can play a role.

CLINICAL MANIFESTATION:

- Edema is the most specific, symptom, it occurs mostly, unilaterally.
- Leg pain is not a specific symptom, it occurs in half of the patients
- Pain and Tenderness may be present mostly over calf muscle or may be along the course of deep veins in thigh. Discomfort in the calf muscle on active dorsi extension of the foot.
- Superficial thrombophlebitis presents with a tender, palpable, cordlike indurated subcutaneous vein.
- Low-grade fever may be present, high-grade fever maybe due to cellulitis or lymphangitis.
- Patient may present with phlegmasia cerulea dolens, which is painful bluish in ammation due to venous engorgement and obstruction
- Leg maybe swollen, painful and bluish in color with or without petechiae.
- There may be phlegmasia albadolens which is painful white in ammation due to iliofemoral venous thrombosis along with arterial spasm

SCREENING INVESTIGATIONS FOR DEEP VEIN THROMBOSIS

D**-dimer tests**

- Laboratory tests: Enzyme linked immunosorbent assay (ELISA) Latex agglutination

  (Agglutination test) Simplify (immunochromatography test)

Plethysmography

- Digital photoplethysmography
- Strain gauge plethysmography
- Impedance plethysmography Venography
- Ultrasonography: Compression ultrasound Duplex ultrasonography Colour coded Doppler ultrasonography
- Computed tomography
- Magnetic resonance imaging

TREATMENT:

The standard initial management of deep vein thrombosis has traditionally meant admission to hospital for continuous treatment with intravenous unfractionated heparin. Treatment then continued with a transition to long term use of oral anticoagulants (vitamin K antagonists). Recently a change has taken place, and low molecular weight heparins are being used.

HEPARIN

Low molecular weight heparin is at least as effective as unfractionated heparin in preventing recurrent venous thromboembolism, and statistically significantly reduces the occurrence of major haemorrhage during initial treatment and overall mortality at the end of follow up. Long term treatment with low molecular weight heparin is sometimes indicated rather than treatment with oral anticoagulants, for patients with contraindications to anticoagulants (for example, pregnant

THROMBOLYTIC DRUGS

There is weak evidence that thrombolytic such as streptokinase may produce more rapid resolution of symptoms and preserve venous valve integrity and hence decrease the incidence of the post-phlebitic syndrome. However, the risk of bleeding complications is three times greater, and for this reason thrombolytic are now seldom used

Inferior vena cava filters are inserted to reduce the rate of pulmonary embolism. The indications for their use include:

- Pulmonary embolism with contraindication to anticoagulation, and
- Recurrent pulmonary embolism despite adequate anticoagulation.

ELASTIC COMPRESSION STOCKINGS

Patients with a deep vein thrombosis should wear compression stockings as the rate of post-thrombotic syndrome may be reduced. In one study of 194 patients (with a first episode of proximal deep vein thrombosis) the rate of post thrombotic syndrome was reduced by 50% if graded compression stockings were used.

CONCLUSION:

DVT is a clinically entity with potential risk, as it can lead to pulmonary embolism. Therefore, it needs to be diagnosed as soon as possible, followed by quick intervention

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