Tikrit university

College of Nursing

Clinical Nursing Science

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Critical Care Nursing

(Pulmonary Embolism)

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Pulmonary Embolism

Definition

A pulmonary embolism (PE) occurs when a clot (thrombotic embolus) or other matter (nonthrombotic embolus) lodges in the pulmonary arterial system, disrupting the blood flow to a region of the lungs.

Causes and Origin of Pulmonary embolism :

1.Thrombotic Emboli :The majority of thrombotic emboli arise from the deep leg veins, particularly the iliac, femoral, and popliteal veins.

2.Nonthrombotic emboli : Rare causes include septic emboli (from endocarditis affecting the tricuspid or pulmonary valves), tumour (especially choriocarcinoma), fat following fracture of long bones such as the femur, air, and amniotic fluid, which may enter the mother's circulation following delivery.

Major risk factors of venous thrombosis:

- **Deep vein thrombosis (DVT)**
- **Active cancer**
- **Recent surgery** (e.g. within last 2-3 months)
- **Significant immobility** (e.g. hospitalisation, bed-rest)
- **Lower limb trauma/fracture**
- **Pregnancy** (+ 6 weeks postpartum)
- **Combined oral contraceptive pill**
- **Long-distance sedentary travel**
- **Thrombophilia**
- **Obesity**

Clinical Features Of Pulmonary Embolism:

The symptoms of pulmonary embolism can vary widely depending on the size of the clot and the extent of the blockage. Common symptoms include:
Shortness of Breath: Sudden difficulty in breathing is one of the hallmark symptoms of PE. It may occur unexpectedly and can worsen with physical activity.

Chest Pain: Patients may experience sharp or stabbing chest pain that may feel like pressure. The pain can be persistent or intermittent and may worsen with deep breathing.

Coughing: A persistent cough, sometimes accompanied by blood-streaked sputum.

Rapid Heart Rate: tachycardia may occur as the heart tries to compensate for the reduced blood flow.

Lightheadedness or Fainting: Severe cases of PE can lead to dizziness, lightheadedness, or even loss of consciousness due to hypoxia.

Swelling: Swelling, particularly in one leg, may be observed if the clot originated from a deep vein thrombosis (DVT).

Diagnosis Of Pulmonary Embolism:

Diagnosing pulmonary embolism involves a combination of clinical assessment, imaging tests, and laboratory tests:

Clinical Evaluation: A healthcare provider will assess symptoms, medical history, and risk factors.

D-dimer: An elevated d-dimer will occur with a PE and a number of other disorders. A normal d-dimer will not occur with a PE and thus can be used to rule out a PE as the diagnosis.

Electrocardiogram (ECG): The most frequent ECG finding seen in the patient with a PE is sinus tachycardia.

Echocardiography (ECHO): Useful in the identification of a PE, because it can provide visualization of any emboli in the central pulmonary arteries.

CT Pulmonary Angiography (CTPA): A primary diagnostic tool, CTPA uses contrast dye to visualize clots in the pulmonary arteries.

Ventilation-Perfusion (V/Q) Scan: This test evaluates the distribution of air and blood in the lungs to identify areas of abnormality.

Ultrasound: An ultrasound of the legs may be performed to detect deep vein thrombosis that could have led to PE.

Treatment Of Pulmonary Embolism

Treatment for pulmonary embolism aims to dissolve the clot, prevent new clots, and manage symptoms. Treatment options include:

Anticoagulants (Blood Thinners): Medications such as heparin or warfarin help prevent further clotting and allow the body to break down the existing clot over time.

Thrombolytics (Clot Busters): In severe cases, thrombolytics may be used to rapidly dissolve the clot. These are generally reserved for life-threatening situations due to their potential side effects.

Inferior Vena Cava (IVC) Filter: For patients who cannot take anticoagulants or have recurrent PE despite treatment, an IVC filter may be placed in the inferior vena cava to catch and prevent clots from reaching the lungs.

Nursing Management

1. Prevention of PE should be a major nursing focus, because the majority of critically ill patients are at risk for this disorder.

2. Nursing actions are aimed at preventing the development of DVT, which is a major complication of immobility and a leading cause of PE. These measures include the use of pneumatic compression devices, active/passive range-of-motion exercises involving foot extension, adequate hydration, and progressive ambulation.

3. Nursing interventions to optimize oxygenation and ventilation include positioning, preventing desaturation, and promoting secretion clearance.

4. The patient receiving anticoagulant or fibrinolytic therapy should be observed for signs of bleeding. The patient's gums, skin, urine, stool, and emesis should be screened for signs of overt or covert bleeding.