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Pulmonary Embolism

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Pathophysiological Process

Acute PE caused by thrombo-emboli may be spontaneous or often originates in the deep venous system of the lower extremities, upper right side of the heart or pelvis (Morici, 2014). There are several factors that can increase a patient’s susceptibility to thrombosis formation. Venous thrombosis (venous, vessel wall injury, and hypercoagulability) can be used to assess the patient’s risk of developing thrombus (Morici, 2014). Staasis is often considered the most prominent factor, which, in comparison, with other vessel damage or hypercoagulability, can lead to clot formation; staasis can present in a variety of settings, including immobilization, chronic venous insufficiency, paroxysm secondary to strike or other causes, and varicose veins (Morici, 2014).

Once deep vein thrombosis develops, clot may dislocate and travel through the venous system and the right side of the heart into the pulmonary arteries where they partially or completely occlude one or more vessels (Tapos, 2018). The outcome depends on the site and number of emboli, the underlying condition of the lung, how well the right ventricle is functioning, and the ability of the patients body to dissolve the clot(s).

Small emboli may have no acute physiologic effects and may be able to dissolve immediately and resolve within hours or days. Larger emboli can cause a reflex increase in ventilation (tachypnea), hypoxemia due to ventilation/perfusion (V/Q) mismatch, and low mixed venous oxygen content as a result of low cardiac output, sepsis due to deodorized hypoxemia and abnormalities in surfactants, and an increase in pulmonary vascular resistance caused by mechanical obstruction and vasoconstriction (Tapos, 2018). When large emboli occlude major pulmonary arteries, or when many small emboli occlude > 50% of the more distal vessels, RV pressures increase, which may lead to acute RV failure, shock, or sudden death. The risk of death depends on the degree and rate of rise of right-sided pressures and on the patient's underlying cardiovascular status (Tapos, 2018).

Hemoptysis, leg swelling/discomfort, chest discomfort, breathlessness, chest discomfort, etc. is the clinician's responsibility to take the proper steps in diagnosing and treating the possible pulmonary embolism. There are many aspects of a patient's care that must be considered by the clinician when managing a patient with a PE. The articles used throughout this presentation will help to provide additional resources and education to those individuals looking to decrease their knowledge base in regards to caring for a patient with a pulmonary embolism.