International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

A Case Study: Pulmonary Edema

S. Kavitha

Abstract: ***Pulmonary edema is a condition, that caused by too much amount of fluid in the lungs. The fluid collects in the alveoli sacs in the lungs, it very difficult to inhale and exhale. In most cases, cardiac condition associated with pulmonary edema. But fluid can collect in the lungs for many other reasons for example pneumonia, contact with certain toxic drugs and aspiration. Pulmonary edema is a emergency condition that needs immediate medical care to the patient.***

Keywords: edema, parenchyma, extravascular, hypoxia, cardiogenic, non-cardiogenic

1. Introduction

Pulmonary edema can be defined as an abnormal collection of extravascular fluid in the lung parenchyma. This process leads to decreased oxygen exchange at the alveolar level, progressing to life threating cause of respiratory failure. Some of the cardiogenic problem with the inability to remove sufficient blood away from the pulmonary circulation or non-cardiogenic precipitated by injury to the lung parenchyma. It is one of the important conditions to treat emergency medical care. Clinical features include progressive worsening dyspnea, rales on lung auscultation, and worsening hypoxia.

2. Review of Literature

1) Assessment of pulmonary edema: principles and practice Sherif Assaad, Wolf B Kratzert, Benjamin Shelley, Malcolm B Friedman, Albert Perrino Jr Journal of cardiothoracic and vascular anesthesia 32 (2), 901-914, 2018

Pulmonary edema increasingly is recognized as a perioperative complication affecting outcome. Several risk factors have been identified, including those of cardiogenic origin, such as heart failure or excessive fluid administration, and those related to increased pulmonary capillary permeability secondary to inflammatory mediators. Effective treatment requires prompt diagnosis and early intervention. Consequently, over the past 2 centuries a concentrated effort to develop clinical tools to rapidly diagnose pulmonary edema and track response to.

2) Acute pulmonary edema: Pathology, physiology and clinical management AA Luisada, L Cardi Circulation 13 (1), 113-135, 1956

Acute pulmonary edema may be associated with the most varied clinical conditions including cardiovascular, renal, cerebral, and pulmonary diseases, trauma to the skull or chest, infections, and shock. Many drugs and physical means have been employed in the treatment of this syndrome. Two main clinical types of pulmonary edema may be differentiated because of the different effect of therapy in each of them. Antifoaming therapy, a purely symptomatic method of treatment, tends to break a vicious circle and may be lifesaving. It should be employed initially while the patient is being examined and drugs or other remedies are being selected for possible additional treatment.

3. Etiology

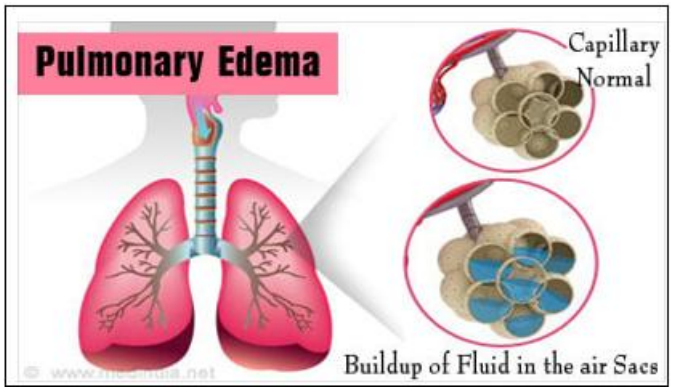
Pulmonary edema classified into cardiogenic pulmonary edema and noncardiogenic pulmonary edema. **Cardiogenic pulmonary edema or volume-overload pulmonary edema** arises due to a rapid elevation in the hydrostatic pressure of the pulmonary capillaries. This is typically seen in the disorders involving left ventricular dysfunction and (acute myocarditis including other etiologies of non-ischemic cardiomyopathy, acute myocardial infarction), valvular function (aortic/mitral regurgitation and stenosis in the moderate to the severe range), rhythm (atrial fibrillation with a rapid ventricular response, ventricular tachycardia, high degree, and third-degree heart

Noncardiogenic pulmonary edema is caused by the only the complaint of lung problem. It not associated with cardiac condition. lung injury with a resultant increase in pulmonary vascular permeability leading to the movement of fluid, rich in proteins, to the alveolar and interstitial compartments. Acute lung injury.

Risk factors
Arrhythmias
Alcohol use
Congenital heart disease
Coronary artery disease
Diabetes
High blood pressure
Sleep apnea
Smoking
Pneumonia

Pathophysiology

Pulmonary edema mostly affected in increased microvascular pressure from abnormal cardiac condition. The blood flow back into the pulmonary-vasculature it leads to inadequate left ventricular function it causes an increased microvascular pressure in the lung, and fluid leak into the interstitial space and the lung alveoli. Other causes of pulmonary edema are hypervolemia or a sudden increase in the intravascular pressure or fluid in the lung



Case Study of Mrs. X

A 64 years female has admitted in the hospital for the complaints of breathing difficulties and persipiration .she has a past medical history of treat of diabetes mellitus for past 10 years.

Clinical Manifestations

- Increasing respiratory distress
- Difficulty in breathing
- Air hunger
- central cyanosis (bluish discolouration of the skin)
- Patients are usually very anxious and often agitated.
- Cold, clammy skin
- As the fluid leaks into the alveoli and mixes with air, a foam or froth is formed. The patient coughs up (or the nurse suctions out) these foamy, frothy, and often blood-tinged secretions.

Diagnostic Findings

- Auscultation reveals crackles in the lung bases (especially in the posterior bases) that rapidly progress toward the apices of the lungs. These crackles are caused by the movement of air through the alveolar fluid.
- The chest x-ray reveals increased interstitial space
- The patient may have tachycardia. Pulse oximetry values begin to fall, and arterial blood gas analysis demonstrates worsening

Medical Management

- Management focuses on correcting the underlying the causes of disorder.
- If the pulmonary edema is cardiac in origin, so the treatment mainly concentrates in the improvement in left ventricular function.
- Vasodilators inotrophic medications, afterload and preload agents, or contractility medications may be administered to the conditions of the patient need.
- If the problem is may be fluid overload diuretics are administered
- Oxygen is administered to correct the hypoxemia and difficulty in breathing
- The patient is extremely anxious and morphine is prescribed to reduce anxiety and control pain.

Nursing management

- Assess the patient condition and monitor the vital signs
- Check the patient any breathing difficulty or any other abnormality e.g cyanosis
- Nursing management includes assisting with administration of oxygen and intubation and mechanical ventilation if respiratory failure occurs.
- The nurse also administered medications as prescribed
- Positioning the patient to promote circulation
- Providing psychological support to the patient and family members
- Assess the patient able to do activities of daily living

Nursing diagnosis

- Impaired gas exchange related to fluid collection in the lungs as manifested by dsypnea
- Ineffective breathing pattern related to shortness of breath and airway irritants.
- Impaired gas exchange related to ventilation –perfusion inequality
- Self care deficit related to fatigue secondary to increased work of breathing and insufficient ventilation
- Activity intolerance due to fatigue, hypoxemia.
- Fear and anxiety related to disease condition

Prevention

- Keep blood pressure under the control
- Manage other medical conditions with proper follow up care
- Don’t smoke
- Don’t drink
- Don’t eat junk food
- Eat less salt drink more fluid
- Choose a healthy diet add more vegetables, legumes, fruits and antioxidant
- Manage weight
- Get regular exercise including walking, breathing exercise

Complications

- Cardiac dysfunction
- Hepatic dysfunction
- Multiorgan system dysfunction
- High attitude pulmonary edema
- Liver congestion and swelling
- Respiratory failure
- Acute respiratory distress syndrome

4. Conclusion

Pulmonary edema is a one of the emergency medical condition. The correct treatment modalities and improve the quality of care to reduce the complications. To maintain healthy life style and avoid sedentary life style to prevent non cardiogenic pulmonary edema. Prevention, can be aided by treating the underlying causes of other disease

References

[1] Joyce M. Black. Medical Surgical Nursing.1st edition, Elsevier publications;944
[2] BT. Basavanthappa, Essentials of Medical Surgical Nursing, 2nd edition Jaypee Brothers Medical publisher (P) Ltd;304
[3] Seenidurai Paulraj, Medical Surgical Nursing Made Esay, 1st edition ;484

[4] Lewis's. Medical Surgical Nursing Assessment and Management of clinical problems, volume II, 3rd edition ;1166
[5] Brunner and Suddarth's. Text Book Of Medical Surgical Nursing, volume II .12nd edition Wolters Kluwer Publications.
[6] Deepak Rathi, "Text book of Medical Surgical Nursing", volume I & II Ist edition published by jaypee brothers
[7] MP Sharma 'Text book of Medical Surgical Nursing Ist edition published by AITBS

Author Profile

Mrs. Kavitha completed her B.Sc (Nursing) in College of Nursing, Madurai Medical College, Madurai, Tamilnadu , India 2016.