COPD: Emphysema

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Signs & Symptoms

The main sign of emphysema is dyspnea (shortness of breath).

Many people who have emphysema may experience fatigue, increased mucous production, and wheezing in the early stages. By the time these symptoms appear, often much of the lung tissue has already been destroyed. These symptoms can often be misdiagnosed for other diseases or illnesses (Cleveland Clinic Foundation, 2017). The disease usually progresses where individuals will experience increasing shortness of breath that affects their daily activities, and eventually individuals will be on oxygen therapy added to patients with moderate to severe COPD (Spencer & Hanania, 2013). Corticosteroids are also another drug therapy added to patients with moderate to severe COPD. It is important to educate the patient on side affects of these medications they are prescribed (Spencer & Hanania, 2013).

Evaluating treatment and how adherence to treatment: Making sure patients are following their treatment plan and have appropriate knowledge of disease is crucial. Patients may be discouraged about their disease usually progresses (Hanania, R. 2013, March 26). Emphysema stages. Retrieved May 30, 2017, from https://emedicine.medscape.com/article/295687-overview#aw2aab4408

Implications for Nursing

• Education: The biggest risk factor is smoking. Smoking cessation is the only intervention shown to reduce the rate of the disease progression and related to mortality (Dolan, 2014). Providing patient education about smoking cessation is crucial in to advancing the stages of emphysema and reducing further damage. Also, it is important to educate patients about proper nutrition, exercise, correct ways to use inhalers, and signs and symptoms of exacerbations (Rerdvan & Chowers, 2015).


• Prescribing appropriate medications for patients with emphysema. Long-acting bronchodilators are the recommended therapy for patients with moderate to severe COPD (Spencer & Hanania, 2013). Corticosteroids are also another drug therapy added to patients with moderate to severe COPD. It is important to educate the patient on side affects of these medications they are prescribed (Spencer & Hanania, 2013).

• Pulmonary rehabilitation is an essential part of the treatment (Spencer, & Hanania, 2013). Pulmonary rehabilitation is the process of helping patients improve their physical, psychological, and social functioning, and has been shown to help improve health status; reduce the frequency of exacerbations; improve exercise capacity; reduce hospitalization; and increase self-efficacy (Spencer, & Hanania, 2013). Pulmonary rehabilitation is an essential part of the treatment (Spencer, & Hanania, 2013). Pulmonary rehabilitation is the process of helping patients improve their physical, psychological, and social functioning, and has been shown to help improve health status; reduce the frequency of exacerbations; improve exercise capacity; reduce hospitalization; and increase self-efficacy (Spencer, & Hanania, 2013).

• Early intervention is crucial in to advancing the stages of disease and diseases that can complicate the management and treatment of emphysema (Spencer & Hanania, 2013). Pulmonary rehabilitation is an essential part of the treatment (Spencer, & Hanania, 2013). Pulmonary rehabilitation is the process of helping patients improve their physical, psychological, and social functioning, and has been shown to help improve health status; reduce the frequency of exacerbations; improve exercise capacity; reduce hospitalization; and increase self-efficacy (Spencer, & Hanania, 2013).

Pathophysiology

There are two types of emphysema, primary and secondary emphysema. Primary emphysema has a genetic component. Primary emphysema is an autoimmune recessive trait of alpha-1 antitrypsin deficiency. Alpha-1 antitrypsin is a protease inhibitor and is made in the liver. This gene is a mutation in the SERPINA1 gene located in the 14th chromosome. This protein helps protect the lungs from damage and disease. If not enough is made, this can damage can lead and to emphysema (Bagguare Anariba, 2017). Secondary emphysema usually caused by environmental factors, mainly from cigarette smoke, occupational and air pollutants (Boka, 2016). Below discuss the pathophysiology behind emphysema.

• Foreign antigens inflate the lung epithelial cell barrier (Boka, 2016). Inflammatory cells responsive to polymorphonuclear cells, eosinophils, macrophages, CD4, CD8 lymphocytes (ShahrArahan, Ham, & Kim, 2008).

• The inflammatory cells transport the antigens to the bronchiolar associated lymphatic tissue layer (Boka, 2016).

• Release of neutrophils, chemotactic factors occur (Boka, 2016).

• Proteolytic enzymes are released mainly by macrophages, which destroys the lungs epithelial barrier (Boka, 2016).

• Proteinases and free radicals are released from macrophages to further damage the epithelial basement membrane (Boka, 2016).

• T lymphocytes in the sputum are mainly CD8 cells. These cells release chemotactic factors to recruit more cytokines as cytokines. This leads to structural change to the lungs (Boka, 2016).

• Oxidative stress (produced from cigarette smoke and released from inflammatory, macrophage, and epithelial cells) production further increases the inflammation (Boka, 2016).

• Proteolytic anti-protease imbalance causes bronchial edema and breakdown of lungs elastin (Boka, 2016).

• Thus, causing elastic fiber damage to the parenchyma, known as emphysema (Burt & Corbridge, 2016).

Significance of Pathophysicsology

Understanding the importance of the pathophysiology and how it affects the individual will help providers to understand the disease of emphysema. Below is the significance of the pathophysiology of emphysema.

• Inflammation decreases the elastic recoil of the lung tissue and destroys alveolar attachments to small airways (Burt & Corbridge, 2016).

• Reduction in alveoli with septal wall destruction reduces gas exchange and causes the “barrel-chested” appearance of the “bags of air” (Burt & Corbridge, 2016).

• Bronchial inflammation increases pulmonary secretions, muscle contraction, loss of alveolar supporting structure and airway edema causes airway narrowing or obstruction (Burt & Corbridge, 2013).

• When the airway is narrowed or obstructed, expiratory flow is decreased causing hyperventilation of lung from small shallow breaths. (Burt & Corbridge, 2013).

• Dyspnea occurs because the lungs are being overworked.(Burt & Corbridge, 2013)

• Individuals will have the appearance of “barrel-chested” due to too much air being trapped in the lungs (The Cleveland Clinic Foundation, 2017).

• Furthermore parenchymal destruction impedes gas exchange and leads to hypoxia. (Burt & Corbridge, 2013)