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Boyer, Conrad, "Chronic Bronchitis" (2018). *Nursing Student Class Projects (Formerly MSN)*. 309.
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Chronic Bronchitis

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Introduction

- Chronic Bronchitis is a facet of the broad disease known as Chronic Obstructive Pulmonary Disease (COPD) (Kim & Criner, 2013).
- COPD affects over 15 million people and is the third leading cause of death in the United States (Mendy et al., 2018).
- There are many factors that can lead to the diagnosis of COPD age and smoking being the most common. However smoking is the considered the most important factor (Johns, Walters, & Walters, 2014).
- 50% of smokers will eventually develop COPD and that statistic is decreased by half following smoking cessation (Johns, Walters, & Walters, 2014).
- As a nurse anesthesia student understanding the pathological condition of this prevalent pulmonary disease will make for a more knowledgeable practitioner and understanding on a cellular level how anesthesia could affect COPD patients.



Figure 1- Chest X-ray of hyperinflated lungs. Retrieved from <http://keywordsuggest.org/gallery/94888.html>

Signs & Symptoms

- COPD is a broad term with multiple pathologies however the initial signs and symptoms are very similar (Hinkle & Cheever, 2014).
- Chronic Bronchitis is defined as the presence of cough and sputum production for at least 3 months in each of 2 consecutive years (Hinkle & Cheever, 2014).
- Characterized by three primary symptoms: Chronic cough, sputum production and dyspnea on exertion (Hinkle & Cheever, 2014).
- According to Johns, Walters and Walters (2014) there is a debate between the Global Initiative for Chronic Obstructive Lung Disease-

- (GOLD) and National Institute for Health and Care Excellence (NICE) as to how COPD should be diagnosed. The NICE advice not diagnosing COPD in the absence of symptoms in patients with mild airway obstruction and GOLD thinks practitioners should (p. 1562).
- Research from Elbehairy, Webb, Neder and O'Donnell (2013) align more with GOLD emphasizing that it is cost ineffective to screen all smokers for COPD and many COPD patients evade diagnosis related to barriers (p. 1995).
- Barriers to diagnosis being perception of practitioner misguided, physiological adaptations, patients successful minimization of symptoms, limitations to diagnostic spirometry, lack of evidence to early drug therapy to decrease disease progression and early diagnosis can be challenging given broad phenotypic expression (Elbehairy et al., 2013).

Underlying Pathophysiology

- In COPD the airflow limitation is both progressive and associated with abnormal inflammation that occurs throughout the proximal and peripheral airways, lung parenchyma and pulmonary vasculature (Hinkle & Cheever, 2014). The constant irritation of Chronic Bronchitis causes mucus-secreting glands and goblet cell hyperplasia causing increase mucous production (Hinkle & Cheever, 2014). This leads to mucous plugging, bronchial wall thickens, narrowing airway and scarring (Hinkle & Cheever, 2014).
- Mucous metaplasia is the pathologic foundation of Chronic--

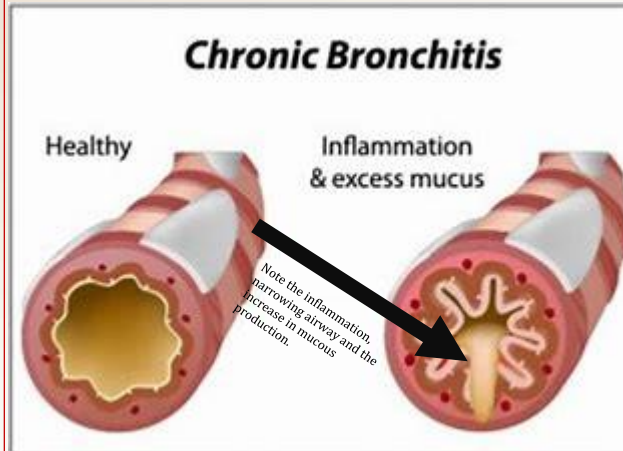


Figure 2- Normal bronchial vs Bronchitis airway. Retrieved from https://www.physio-pedia.com/Chronic_Bronchitis

- Bronchitis, hypersecretion of mucous and decreased cilia function is a consequence of cigarette smoking exposure (Kim & Criner, 2013).
- Significance of Pathophysiology**
- Increased risk of bacteria and viral respiratory infection. Narrowing airway leads to difficulty breathing, wheezing, obstruction and decreased airway clearance (Hinkle & Cheever, 2014).
- Chronic inflammation causes increased extracellular matrix deposits producing fibrous scar tissue and thicken airway walls resulting in loss of elasticity of lung tissue and poor lung compliance (Ferrari et al., 2016).
- Chronic Bronchitis carries increased risk of COPD exacerbation than those without Chronic Bronchitis (Kim & Criner, 2013).
- Increase risk of lung cancer and mortality (Johns, Walters & Walters, 20114).
- Increased pulmonary vascular resistance equals increased Right Ventricle afterload leading to right Heart Failure (Kawut et al., 2014).



Figure 3- Depiction of smoke entering the lung tissue. Retrieved from <https://www.vapour.com/latest/smoking-related-lung-disease-to-cost-the-nhs-2-3billion-by-2030/>

Implications for Nursing

- Education- Kim & Criner (2013) the primary risk factor of COPD is smoking, inhalation of biomass fuels, dust, chemical fumes and environmental irritates. Gastroesophageal reflux disease has shown to cause COPD, relate to aspirated gastric content causing pulmonary irritation (p. 229). Smoking cessation is the most cost-effective intervention to reduce COPD and stop its progression (Hinkle & Cheever, 2014).
- Treatment- The goal of treatment is to reduce/slow the progression of COPD while promoting airway clearance and opening airway to reduce symptoms. Each patient with COPD is different, but the use of short/long beta agonists, inhaled steroids, anticholinergics, antibiotics and antioxidants are used in varying combinations (Kim & Criner, 2013).
- Alternative therapies- Intervention such as chest physiotherapy with postural drainage, stay hydrated to thin secretions, improving breathing patterns with diaphragmatic and purse lip breathing to reduce air trapping and prevention of disease with annual flu and up-to-date vaccines (Hinkle & Cheever, 2014).

Conclusion

COPD a broad and complex but preventable disease with proper education and safety measures could possibly decline in the future. However, until then it is important for practitioners to understand the pathology at work, to better teach, treat and improve the quality of life in COPD patients.

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