Concepts of Cardiovascular Disorders

Student's Name

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Week 3 Assessment: Concepts of Cardiovascular Disorders

Pathophysiology & Clinical Findings of the Disease

1. Are the spirometry results consistent with obstructive or restrictive pulmonary disease? What is the most likely pulmonary diagnosis for this patient?

Spirometry is a type of pulmonary function test. This test measures how much air is inhaled and exhaled from a patient's lungs. It also measures how fast the air is inhaled and exhaled. The main volumes for interpretation are the forced vital capacity (FVC), which is the total amount of air that can be expelled from full lungs (Langan et al. A.G. 2020), and the forced expiratory volume in one second (FEV1). If there is a normal FVC and a decrease in the FEV1/FVC ratio, this indicates an obstruction defect's potentiality. According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, patients with less than 70% or 0.7 FEV1/FVC ratio indicate obstructive pulmonary defect (2020). The patient is most likely experiencing obstructive pulmonary disease in the case study. The patient did a spirometry test, and his FVC was 93%, FEV1 64%, and FEV1/FVC ratio /1 64% was 69%. His FVC is normal at 93%, but his FEV1/FVC ratio has decreased at 69%. These results are consistent with obstructive pulmonary disease.

2. Explain the pathophysiology associated with the chosen pulmonary disease.

Obstructive pulmonary disease results from the combined processes of peripheral airway inflammation and narrowing of the airways. This leads to the limitation of airflow and the destruction and loss of alveoli. One of the main risk factors for chronic obstructive pulmonary disease (COPD) is smoking. The epithelial cells that line the airways are irritated due to the smoke inhalation. Over time, chronic irritation and inhalation cause small airway disease and parenchymal destruction (McCance et al., S.E. (2019). Long-term inflammation causes

constriction of the bronchi, reducing airflow in the lungs. Reduced airflow on exhalation leads to air trapping and carbon dioxide retention, resulting in reduced inspiratory capacity. The abnormality in gas exchange occurs due to the reduced airflow and ventilation from the destruction and loss of alveolar structure (McCance et al., S.E. (2019). Low blood oxygen levels and increased blood carbon dioxide levels result from impaired gas exchange and can worsen as the disease progresses.

3. Identify at least three subjective findings from the case that support the chosen diagnosis.

Subjective findings that support the chosen diagnosis are the patient's complaints of fatigue, increased dyspnea for the past 3 months, and the shortness of breath that has not improved that he feels like that is getting worse. He also states that he has a dry, nonproductive cough in the morning. The abnormality in gas exchange from the obstructive is most likely the reason why the patient is experiencing fatigue, shortness of increased dyspnea. pulmonary disease breath, and 10

4. Identify at t least three objective findings from the case which support the chosen diagnosis

Objective findings that support the chosen diagnosis are seen in the chest x-ray that shows lungs are hyper-inflated bilaterally with a flattened diaphragm. Upon auscultation, his lungs have bilateral wheezes heard with forced exhalation along with a prolonged expiratory phase. He is also tachypneic with a respiratory rate of 22, and his SaO2 is low at 93%. All these findings are consistent with obstructive pulmonary disease.

Management of the Disease

*Utilize the required Clinical Practice Guideline (CPG) to support your treatment recommendations.

1. Classify the patient's disease severity. Is this considered stable or unstable?

Severity is determined with the use of a bronchodilator after the initial spirometry test. The patient will take two spirometry tests, one before the administration of a bronchodilator, and one after the bronchodilator. In this case study, the patient's FEV1 after the bronchodilator only increased from 64% to 66%. According to the GOLD criteria (2020), the patient is experiencing moderate severity with his COPD because his FEV1 after the bronchodilator was in between 50-79%. This patient's severity is considered stable because his symptoms are manageable and pulmonary decline is minimized, (Bollmeier, S. G., &; Hartmann, A. P. 2020). The patient did not experience frequent or severe exacerbation that required department, which is seen in unstable patients with COPD. the need to go to the emergency.

2. Identify two (2) "Evidence A" recommended medication classes for the treatment of this condition and provide an example (drug name) for each.

According to the GOLD criteria, long-acting beta2 antagonists (LABAs) and long-acting antimuscarinic antagonists (LAMAs) significantly improve lung function dyspnea, health status, and reduce exacerbation rates (Evidence A), (2020). An example of a LABA is Vilantero, and an example of a LAMA is Umeclidinium. Their combined brand name (Vilantero/Umeclidinium) is Anoro Ellipta.

3. Describe the mechanism of action for each of the medication classes identified above.

In long-acting beta2 agonists, its mechanism of action is to relax airway smooth muscle by stimulating beta2-adrenergic receptors, which increases cyclic AMP and produces functional

antagonism to bronchoconstriction. In long-acting antimuscarinic antagonists, they block the

bronchoconstriction effect of acetylcholine on M3 muscarinic receptors expressed in airway

smooth muscle, (Global Initiative for Chronic Obstructive Lung Disease (2020). They're called

long acting because the effect lasts at least twelve hours.

      4. Identify two (2) "Evidence A" recommended non-pharmacological for this patient.

      Non-pharmacological treatments for this patient include physical vaccination (Global

Initiative for Chronic Obstructive Lung Disease (2020). These are both Evidence A

recommendations from the GOLD criteria. Physical activity is a strong predictor of acrease the

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mortality, and patients should be encouraged to of physical activity. It is recommended for all

patients with COPD. Since the flu causes additional inflammation, it is a COPD symptom and

the worse.