HSO4007: Anatomy and Physiology for Health and Social Care

Anatomy and Physiology

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1. Introduction

According to medical science, a physiological condition is a state of the human body when it starts to deflect because of organ malfunctions or external influences. Chronic Obstructive Pulmonary Disease (COPD) is a type of chronic inflammatory lung disease that hinders airflow from the lungs. However, COPD has the capability to damage the lungs and lead humans to suffer from difficulties in breathing. The primary aim of this portfolio is to identify relevant anatomy of the respiratory system for defining the concept of COPD. Furthermore, it will highlight the possible impacts of this chronic health condition on other systems of the human body with valid resources. This essay will discuss COPD in detail to develop an idea about this disease. This essay will illustrate the way it can harm the daily living standard of the patient with valid evidence. Finally, this essay will assess the applicable treatments, care and monitoring that are required to offer the patients properly.

2. Description

COPD (Chronic Obstructive Pulmonary Disease) is a highly inflammatory disease that creates breathing issues by obstructing airflow from the lungs. Mainly two types of COPD can be found in human bodies including chronic bronchitis and emphysema. During chronic bronchitis, people suffer from coughing with mucus for a long time. Alternatively, emphysema damages the lungs of people over time (Mayo Clinic, 2023). According to reports, smoking is one of the major reasons for this chronic disease. Long-term smoking can lead people to suffer from COPD over the decades. Several researches proved that asthma increases the chances of occurring COPD. Dust, chemicals and pollution can also cause this in human bodies. The airflow is restricted in the lungs because COPD narrows the bronchi. According to the reports, about 25% of COPD patients never smoked in their lives. COPD is the second most common lung disease in the UK

in recent years. Approximately 1.2 million people were suffering from this disease in the UK during the financial year 2021-2022 (ALA, 2023). However, this disease can lead the patients to death if they do not take proper treatments. People over 65 years old have the highest death rates from COPD which is about 86% in 2023 (NPJ, 2023).

Breathing is the main work of the lungs and it is affected by COPD significantly. As per the evaluation phase of Gibbs' Cycle, I have analysed that it creates breathing issues in the human body and also damages the lungs the most. The development of narrow airflow passages is directly linked to physiology and anatomy of COPD. Bronchoconstriction as well as inflammation make the air passages narrow and lead the patients to suffer from breathing issues (NPJ, 2023). COPD has four stages including early, moderate, severe and very severe. Highly critical COPD conditions can also lead patients to death. COPD negatively affects the function of bronchioles and reduces the air filling capability of lungs. COPD limits the airflow in the lungs and creates muscle-fibre shortening in the diaphragm. Eventually, this situation impairs diaphragmatic mobility and it reduces the breathing by 80% in several medical conditions (CDC, 2023).

The air sacs in the lungs become incapable of containing air. Eventually, this condition can also lead the air sacs to become less elastic and also destroy a few air sacks. According to Gibbs' reflective cycle, damaged air sacs and narrowed air passages are the main anatomy behind the development of COPD. However, emphysema is a type of COPD that destroys fragile walls and fibres of alveoli. This situation collapses small airways and hinders the diaphragm from pulling lungs downwards (ATrain Education, 2023). Hence, air cannot be inhaled to the lungs through mouth, nose and trachea. A large amount of mucus blocks the bronchial tubes and creates

chronic cough. It leads lungs to create high pressure and cause the resultant barrel chest with COPD (Barnes, 2020).

Respiratory systems move oxygen to the bloodstream and from the lungs. During that time, carbon dioxide is exchanged with the inhaled oxygen systematically. The respiratory system includes different parts including the bronchus, lungs, trachea, nose, mouth, diaphragm, nasal septum and respiratory epithelium. COPD mainly damages the lungs and it hampers functions of whole respiratory systems (ATrain Education, 2023). Hence, this system fails to move oxygen to cells and blood vessels properly. Reduction in stretching and shrinking abilities of the lungs hampers the air movement capability to blood vessels. However, people with COPD are more likely to get affected by colds and flues. Several times, combined effects of flues and COPD damage the tissue and cells of lungs (Barnes, 2020).

However, critical COPD can increase respiratory infections and make people intensely ill. Chest infection is a common type of impact of COPD on the human body in recent times. Common cold leads people to suffer from severe chest infections and inflammatory disease. Malfunctions in the respiratory system can also cause pneumonia and lead people to suffer from fever, cough as well as breathing challenges (ATrain Education, 2023). This disease infects parts of the respiratory system including alveoli and bronchioles. Critical COPD can also create collapsed lungs and develop unwanted air pockets. In this case, air leaks into the space between the lungs and chest wall. Eventually, air leakages can create shortness of breath and sudden chest pain which can create life threats (CDC, 2023).

Chronic Obstructive Pulmonary Disease (COPD) is a chronic state of the human body that generally impacts on respiratory and circulatory systems. It blocks the normal flow of oxygen and carbon dioxide from the lungs by complicating the normal breathing pattern of patients

(WHO, 2023). It has been noticed that in the majority of cases, the shortness of breath is generally felt by COPD patients during physical activities. Besides this, there are several signs and common symptoms of COPD including energy deficiency, infection in the respiratory tract and chest stiffness. Wheezing is another major sign of COPD that informs the urgency of treatment and proper medication (WHO, 2023). Chronic cough is one of the major common symptoms of COPD which may produce yellowish or greenish mucus.

Besides this, COPD patients may show an unintended reduction in body weight in the advanced stage which is a common sign of COPD. Patients with COPD further show swelling issues in feet and legs which indicates the urgency of treatment. In addition to this, chronic bronchitis may form due to COPD which closes the lung alveolus. Furthermore, medical studies and articles have shown that these patients may show frequent fevers over 101 degrees Fahrenheit (WHO, 2023). In addition, they may feel dizziness and lightheadedness which prominently indicates the signs of COPD. The early signs of COPD further involve extreme fatigue while walking up the stairs or carrying heavy loads (WHO, 2023). Besides this, some COPD patients are identified with blue fingernails or lips which are another symptom of this chronic disease.

As per medical studies, chronic pulmonary diseases have a relationship with the functioning of the heart. Medicines have shown that low-grade systematic functioning of the lungs can cause heart failure issues among patients (Pietrangelo, 2023). Besides this, patients with moderate or severe COPD have a higher risk of cardiovascular disease as well. The normal blood pressure rate also fluctuates due to high COPD issues among patients as per evidence-based studies. It can disrupt the normal functioning of the human being due to high blood pressure issues and heart rate fluctuation (Pietrangelo, 2023). Besides this, COPD may trigger Punlomary Hypertension among patients which can reduce the standard quality of life. A news report has shown that

almost 20% of COPD patients have been identified with Cardiac Dysfunction and artery disease (Howley, 2017).

In addition to this, evidence-based reports have shown that COPD is further associated with disruption of Histidine-Histamine and Creatinine metabolic pathways. Hence, the process of homeostasis is also restricted due to this chronic disease of the lungs. Hence, an equilibrium state of the human body in terms of internal, chemical, physical and social is disrupted precisely (Leslie *et al.*, 2021). It causes a major dysfunction of several chemical and hormonal elements within the human body. In addition to this, Bronchial inflammation and frequent bacterial infection in the respiratory tract reduce the energy of patients to perform their day-to-day activities (Howley, 2017). Therefore, it is essential for COPD patients to consult doctors and take regular medicines to reduce their negative impacts on normal living.

There are a few ways that can be employed by patients and medical practitioners to limit the impacts of COPD. COPD patients are required to quit smoking and take adequate rest as primary care measures after getting alarming alerts from doctors. Besides this, controlling the breathing pattern through effective breathing exercises can reduce the shortness of breath. In addition to this, regular exercise and lung therapies are also fruitful treatment channels for addressing COPD (Mayo Clinic, 2023). Oxygen therapy and pulmonary rehabilitation programmes are effective treatment methods for reducing the negative impact of COPD. As per NICE guidelines, healthy diet intake can further help patients to minimise the negative impacts of COPD. In addition to this, healthy food intake can further control the underweight and overweight issues among COPD patients.

According to Infection Control guidelines, the application of Bronchodilators such as Levalbuterol and Ipratropium can relax the muscles of the airways by reducing the effort while

breathing. Doctors and medical technicians can further offer Fluticasone and Budesonide to help the patients in preventing exacerbation issues (Mayo Clinic, 2023). Besides this, inhaled steroids and oral steroids with combined bronchodilators can be useful solutions for COPD. Additionally, Theophylline, Phosphodiesterase-4 inhibitors and antibiotics can be applied by medical professionals to induce the prevention of COPD (Mayo Clinic, 2023). These medicines can be effective for patients who have identified with severe Bronchitis and COPD symptoms. Besides this, research reports have shown that lung transplant and lung volume reduction surgery along with Bullectomy are essential for treating COPD patients.

Research experts in medical institutes are required to collaborate as a team in order to offer coordinated care to COPD patients. In addition to this, doctors are required to develop effective medical solutions by identifying the symptoms among them (Rhee *et al.*, 2019). Besides this, individual care by nursing staff and medical technicians is further required for comprehensive care of COPD patients. Additionally, medical specialists are required to be registered for COPD patients who have expertise in treating alpha-1-antitrypsin deficiency (Mayo Clinic, 2023). In addition to this, endoscopic lung volume reduction surgery is required to be employed by clinical professionals in order to offer effective care to these patients.

In addition to this, it is essential for severe COPD patients to visit medical institutes and hospitals for regular checkups in order to control the severity. Clinician appointments are required to expose the current smoking status of COPD patients in order to determine the regular monitoring systems. Additionally, lung functioning needs to be monitored on a daily basis to prevent sudden dysfunction or deterioration (Rhee *et al.*, 2019). Besides this, medical practitioners are required to monitor the side effects of medicines in order to maximise the effectiveness of treatment. Patients with COPD need to be reevaluated monthly by health

practitioners in order to monitor inhalation technique, exercise tolerance and food intake. Similarly, respiratory symptoms are required to be recorded monthly in order to monitor the effectiveness of lung transplants.

Besides this, it is essential to use ICT skills in health and social care services as it maximises the capability of multitasking for healthcare institutes. As a professional health and social care professional it is vital to record the past medical conditions of patients while treating complicated cases like COPD (Konttila *et al.*, 2019). However, it has been observed that the ICT skills of healthcare professionals support them in maintaining past clinical records of patients along with current medical reports. Besides this, the therapeutic treatment for COPD management requires proficiency in machine learning and ICT skills (Konttila *et al.*, 2019). Therefore, a healthcare worker needs to acquire efficiency in basic computer skills to manage patient management functions precisely.

In addition to this, the surgical procedure for severe COPD patients requires ICT skills in order to maintain medical equipment and surgical machines. Furthermore, electronic imaging of respiratory and cardiovascular systems also needs expertise in ICT skills for health and social care workers. Healthcare practitioners and nursing personnel require standard accreditation of technical knowledge in order to perform ventilation functions for COPD patients (Nyberg *et al.*, 2023). Similarly, stable management of post-surgical patient monitoring further requires good ICT knowledge while recording the readings of machines. As per Gibbs' cycle, I have realised that my moderate knowledge of ICT skills assisted me in monitoring COPD patients in my health care centre. Henceforth, ICT skills are important for managing patient care programmes as a social and health care worker.

3. Conclusion

This essay has presented a detailed discussion of COPD with suitable justification and valid resources by mentioning the severity of the disease. According to the above discussion, this physiological condition attacks the lungs directly and hampers their normal functioning. The essay has outlined the detailed anatomy of the respiratory system along with valid medical studies to support the discussion. Besides this, the impacts of COPD on other systems of the body have been mentioned in this essay in detail with evidence-based studies. In addition to this, the study has further highlighted key signs and symptoms of COPD along with clinical evidence. Proper care and treatments can cure humans from this physiological condition quickly. Finally, this report has described the implemented treatments, monitoring processes and care for curing this disease quickly.

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