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Case Study: Chronic Obstructive Pulmonary Disease (COPD)

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Case study: Female aged 56- a year with S.L.E. and COPD

Presentation of the case

A 56 years old female patient has a history of systemic lupus erythematosus (S.L.E.) and COPD. Symptoms began around prior and gradually improved as she continued to get medications. She has been experiencing Coughing, sputum production, palpitations, chest pain, and wheezing. She describes new-onset and shortness of breathe, labored breathing at rest, mild weariness, feeling chilly and depressed. There are no documented allergies to foods, medications, or the environment.

Her medication includes Hizentra 15 grams, Benlysta 200mg weekly, prednisone 15mg, Amitiza 60x2, Cymbalta 60x2, Topiramate 50 x 2 and 100x2 Fosamax 70 mg week, Botos 200 Units (S.L.E. migraines) Singular 10, Allegra 180, Wellbutrin 300, and Pilocarpine 5x4 and took most medicines of them was taken every week.

Past medical history is significant in developing coronary artery disease, COPD, hypertension, hypothyroidism, myocardial infarction, hyperlipidemia, diabetes mellitus, peripheral vascular disease, and cigarette use. A history of heart catheterization, appendectomy, stent nephrectomy, implantation, hysterectomy, or is noteworthy.

Chronic obstructive pulmonary disease (COPD)

COPD is a life-threatening group of diseases and conditions that cause airflow and breathing problems. The evolution of advanced functions associated with COPD is referred to as pathophysiology. People with the disease experience airway damage and tiny air sacs in their lungs.

Different bodies have different definitions of the disease. American thoracic society (A.T.S.) defines COPD as states characterized by limitation of airflow due to chronic bronchitis or emphysema, two main types of COPD. Obstruction of airflow is progressive, and sometimes it is accompanied by hyperactivity, and parts may be reversible. European Respiratory Society (E.R.S.) stated that COPD reduces high expiratory and flow lowers forced emptying of the lungs (Delcroix et al., 2020). The Global Initiative for Chronic Obstructive Lung Disease (GOLD) defines disease as a state associated with a limited airflow that's not reversible entirely.

The airflow limitation is closely associated with abnormal lung inflammation in response to gasses or harmful particles, and it's progressive. It includes emphysema, lung damage, and chronic bronchitis related to long-term cough with mucus. Around 2% of the United Kingdom citizen and 4.5% of the population aged over 40 years living with COPD (Doiron et al., 2019). System lupus erythematosus

refers to chronic disease with a phase of worsening symptoms alternating with mild symptoms. Both COPD and S.L.E. are life-threatening diseases; having both conditions ruins one's body immunes. For COPD patients with lung damage, the process is irreversible. COPD continues to impose a significant economic and health burden in the United Kingdom and worldwide. Some well-known COPD risk factor includes occupational exposures, smoking, asthma, air pollution, airway hyperresponsiveness, and certain genetic variations.

Furthermore, evidence that COPD represents multiple diseases and conditions processes with different interventions continues to rise. COPD prevalence and mortality remain high in most of the world. This research will primarily focus on the cause, type's treatments, symptoms, and preventive measures to control its impacts.

Types of COPD

The patient could be experiencing the two types of the disease based on the symptoms. The primary chronic obstructive pulmonary disease is emphysema and chronic bronchitis. The two disease types are different in the kind of damage they do to the lungs and airways.

Emphysema

In this type of disease, the alveoli, small airways, and air sacs walls experience damage. As a result of the injury, the air sacs lose shape and their degree to recoil in the expiratory breathing process cycle; as a result, the air in the lungs is trapped (Elhakim et al., 2020). The trapped air distends the alveoli making a cycle of obstructions of airways. The lungs become hyper-inflated due to the changes reducing the exchange of gasses. People with this condition find it difficult to breathe and oxygenate the blood and body cells effectively, simultaneously impairing the ability of the lungs to breathe out carbon dioxide from the heart.

Chronic bronchitis

It is a type of COPD where the airway lining stays inflamed and narrower causing shortness of breathing (Guillien et al., 2019). As a result, there is the formation of mucus and swelling. The tiny hairs are destroyed (cilia) in the lung's airways. The disease is associated with long-term cough and phlegm.

Stages of COPD

COPD is diagnosed using different classification systems. GOLD drives the guidelines from breathing spirometry grading. The test captures COPD's one component (Aliagas et al., 2018). For example, the patient's stage was severe since she labored and experienced shortness of breathing. Still, after several weeks of medication, she could speak without conditions. COPD aspects, such as the risk of exacerbations, symptoms severity, and comorbidities presence, are essential to patient experience to prognosis and disease. The stages include mild, moderate, severe, and very severe.

Causes of COPD

Proprietary blend 1: Silica/zeolites, vitamin C, and trace mineral

An essential role of vitamin C in the body's immune system includes; allergic reactivity, tumor suppression, connective tissue maintenance, and antioxidant qualities, known as ascorbate or L-ascorbic acid. COPD symptoms such as wheezing, dyspnea, and worsening have been linked to vitamin C deficiency. It also demonstrates that dietary vitamin C helps to minimize oxidative stress, enhance collagen production, and restore levels of epidermal growth factor and lung cell proliferation (Mosallanezhad et al., 2019). Research shows that intake of vitamin C can help prevent COPD. ACCORDING TO A STUDY, Vitamin C's beneficial benefits on COPD are reliable. A lack of vitamin C can lead to an increased risk of lung tissue damage and necessitate the need for the body to repair this tissue. It is also water-soluble, so it won't accumulate in your body and become poisonous.

Trace substances can influence enzymatic processes and the oxidant/antioxidant balance. COPD is just one of several disorders linked to trace elements, either directly or indirectly. According to recent studies, trace mineral supplements help reduce the time

spent on mechanical ventilation. Chronic hypoxia (such as in COPD) results in a lack of the primary electron acceptor in the respiratory chain, decreasing ATP production. Deficiencies in minerals and trace elements can harm many bodily activities, including numerous enzyme systems.

Smoking

Around 9 out of every 10 instances of COPD are estimated to be caused by smoking. Cigarette smoking is primarily blamed for a whopping 85 to 90 percent of all cases of COPD. More than 7,000 compounds are produced during the combustion process, many of which are hazardous (Alqahtani et al., 2020). You can get COPD by smoking cigarettes, which decreases your lungs' ability to fight off infections, narrows air pathways, promotes air tube enlargement, and decimates air sacs.

Environment

At work, at home, and outside, the air you breathe can play a role in developing COPD (Brightling & Greening, 2019). If you've been exposed to secondhand Smoke or dust or fumes, or chemical vapors for an extended period, you may have COPD.

Dust and fumes

Workplace dust and chemical exposure can harm the lungs and raise your chance of developing chronic obstructive pulmonary disease. COPD has been associated with cadmium dust and fumes, silica dust, isocyanates, welding fumes, grain and flour dust, and a variety of other toxic substances

Pollution of the air

Exposure to air pollution in the long term can impair lung function and raise your chance of developing COPD ("Air Pollution and Chronic Obstructive Pulmonary Disease," 2020). As of right now, there is no definitive evidence linking air pollution to COPD, although studies are ongoing.

Genetics

If someone smokes and has a close relative who has the disease, the development of COPD goes up. Genetics shows that certain people are predisposed to the disease genetically. A hereditary disorder referred to as alpha-1-antitrypsin deficiency impacts approximately 1 person in every 100 patients with COPD (Lázár et al., 2020). Alpha-1-antitrypsin has multiple benefits for the lungs. To avoid lung damage, it is essential to keep it in place. Cigarettes smoking is a significant risk factor for developing COPD in people with alpha-1-antitrypsin deficiency.

Diagnosis of COPD

It is very typical for people with COPD to be misdiagnosed. Unfortunately, many people with COPD go undiagnosed until the disease has progressed to a severe stage. A doctor will examine symptoms and evaluate family and medical history.

Lung function test

During these examinations, your lungs and breathing capacity are evaluated to see if you are getting enough oxygen into your bloodstream (Brandl et al., 2018). You blow into a wide tube attached to a small machine to measure the number of air the lungs can contain and the speed it can blow air out of the lungs during the standard test called spirometry.

A chest X-ray

The most common cause of COPD is emphysema, which may be realized on a chest X ray. It is also possible to rule out heart or lung disease with an X-ray.

A CT scan

If the patient is diagnosed with emphysema, a lung C.T. scan helps evaluate if you are a good candidate for surgery for COPD. Lung cancer screening with C.T. scans is another option.

Arterial blood gas analysis

This analysis test examines how the lungs remove carbon dioxide from the blood and deliver oxygen to the rest of your body.

Laboratory test

Laboratory tests determine the source of symptoms or rule out other illnesses. Lab testing is not necessary. For patients with deficiency of alpha-1-antitrypsin, which causes COPD in certain people, a lab test can be conducted to establish whether or not you have the illness. The patient in the case study has a family history of COPD and acquired COPD early. This test is favourable and recommended.

Treatments and management of COPD

Patients took a drop of proprietary blend 1 in B.I.D., in 2nd week she took two drops, and in week 3, she took 3 drops Most people with COPD experience mild from the disease where little therapy is required and smoking cessation. In an advanced stage of the illness, treatment is applied to control and reduce symptoms, reduce progression, slow exacerbations and complications, and enable the patient to have an active life. Chronic bronchitis and emphysema have no specified cure, researches and studies have stated that medical treatments and lifestyle changes help in improving quality of life and help in delaying worsening conditions. In treatment, she took Benlysta 200 mg to treat systemic lupus erythematosus, for which she had a history of the disease. She also took Hizentra 15 grams and prednisone, which helped improve the chronic condition she was experiencing. The depression she was experiencing was cured as she took Cymbalta orally, and the situation improved over the week as she continued to get medication. Amitiza was so helpful to the patient since it helped in fluid secretion and other chronic idiopathic. Fosamax 70 mg helped the patient treat bone loss (osteoporosis) which is closely associated with the disease.

Smoking cessation

Stop smoking is the most crucial step in treating a COPD regimen. Failure to Smoke can slow COPD progression and improve your breathing capacity. Quitting smoking, on the other hand, is not a simple task. Most people try, and if the situation fails, this endeavor may feel even more overwhelming (Rabe et al., 2018). The best way to avoid relapse is to seek advice from a medical professional about nicotine product replacement and medications. The doctor may recommend group support for those trying to stop smoking. Also, whenever possible, keep off inhaling Secondhand Smoke.

Medications

It is possible to treat and manage both the symptoms and problems associated with COPD with various drugs. Some medications may be taken regularly, while others may only be taken when necessary.

Bronchodilators

Inhalable bronchodilators work by relaxing the muscles surrounding the airways in your lungs. Fosamax that the patient took was helpful as it helped in bone improvements. This can ease Coughing and shortness of breathing difficulties. A long-acting bronchodilator that the patient uses and a short-acting bronchodilator before any physical activity are necessary, depending on the severity of the ailment.

Steroids are inhaled through the nose

The patient took Hizentra, which was helpful in the control of chronic inflammation. Inhaling corticosteroid medicines reduces inflammation of the airways. Bruising, oral infections and hoarseness are all possible side effects. Those who have recurrent COPD exacerbations can benefit from these drugs.

Steroid injections

Short durations of oral corticosteroids prevent COPD from worsening in patients experiencing severe and moderate acute exacerbation. However, medications in the long term cause significant side effects like weight gain, diabetes, osteoporosis, cataracts, and an increased risk of infection.

Antibiotics

The COPD symptoms are likely exacerbated by respiratory infections, like pneumonia, acute bronchitis, and influenza. Antibiotics drugs help treat COPD flare-ups, but they aren't usually advised as a long-term strategy (Stolbrink et al., 2017). Some research regarding antibiotics drugs like azithromycin (Zithromax) reduces COPD, but antibiotic resistance and side effects limit their use.

Lung therapy
Oxygen therapy

Supplemental oxygen is necessary if blood does not contain enough oxygen. Various oxygen delivery systems, including lightweight, portable units that carry around town for errands and other activities, are available.

Pulmonary rehabilitation program

Education, physical training, nutritional counseling, and other forms of support are all standard components of these programs. A team of specialists will work with you to design a rehabilitation plan tailored to your specific needs. Treatments for deteriorating COPD with pulmonary rehabilitation may help you avoid a hospital stay, return to daily activities, and enhance your overall health and well-being.

Taking care of flare-ups

Even if you receive regular treatment, you may suffer periods of deterioration in your symptoms that last for days or even weeks. Air pollution and respiratory infections are possible sources of inflammation that can lead to exacerbations. Additional drugs (such as antibiotics, steroids, or a combination of the two), oxygen therapy, or even hospitalization may be necessary if an exacerbation occurs.

Surgery
Lung volume reduction

The physician removes small chunks of damaged upper lung tissue during this procedure. As a result, healthy lung tissue expands, and the diaphragm functions more effectively. An endobronchial valve implanted in the lung decreases the damaged lobe, allowing the healthy portion to grow and function more effectively. This procedure is called Endoscopic Lung Volume Reduction (ELVR).

Lung transplant

A lung transplant may be an option for those who meet specific requirements. The capacity to breathe and move around more freely after a transplant is one of the many benefits of the procedure (George et al., 2019). Patients take immune-suppressing medications for the rest of their lives because it is a significant operation with severe risks like organ rejection.

Lifestyle change

Her pulmonologist always asked the patient to do some exercise like walking to improve her mood and smoothen her breathing difficulties. They may also want to ask for help from family and friends. In addition, keeping their surroundings free of irritants such as second hand Smoke is a good idea for them (Akyil et al., 2021). COPD symptoms might make it difficult for some people to eat enough. If this is the case, they should consult with their physician to determine the best course of action to ensure that they receive adequate nourishment. Even a doctor might recommend eating smaller, more frequent meals.

COPD symptoms

Breathlessness

Symptoms of COPD include shortness of breath (or dyspnea) because the obstruction in your breathing tubes makes it harder to transport air into and out of your lungs. The patient experienced breathing complications which are associated with COPD. Inhaling and exhaling become more difficult because many people try to prevent this feeling by becoming less active. Shortness of breath can worsen if you follow this strategy for long periods. Avoiding physical activity might result in being unfit or deconditioned, leading to further shortness of breath during physical activity.

Tiredness

COPD patients frequently complain of exhaustion (or exhaustion). When you're weary, you're less likely to stay active, which increases your energy loss and, in turn, your sleepiness. It might be challenging to break this pattern once it has begun.

Excess mucous

COPD can cause a buildup of mucus (phlegm or sputum). Several ounces of mucus is usual for the lungs to generate daily. To maintain a moist environment in the respiratory tract, mucus is a must. Typically, you swallow this mucous without even realizing it. To protect themselves from infection or irritants, the lungs produce more mucus than usual, which causes the patient to cough. Mucus production is frequently attributed to smoking. Additionally, vaping using

e-cigarettes and similar devices might produce symptoms and should be avoided.

Cough

Coughing is a typical symptom of COPD. Sputum (phlegm) and mucus (sputum) can cause CoughingCoughing, but they can also be a means for the airways to protect themselves against irritating substances (Crooks et al., 2018). When the mucus is cleared from the lungs, CoughingCoughing is healthy. Pneumonia and oxygen deprivation can be caused by excessive mucus in the breathing tubes. Coughing up mucus is essential, but you don't want to overdo it to the point where it's doing more harm than good. Getting mucus out of your lungs requires a forceful cough, but not one that is unnecessarily exacerbating your condition. Smoking-induced cough is unlikely to go away until you quit the habit. Throat lozenges treat coughs caused by various irritants (cough drops).

Conclusion

The patient had a history of COPD and S.L.E., and she needed close attention from her family and her pulmonologist. Under intensive care, their condition will be better and reduce readmission since she will not be under a depression of the disease. COPD is a serious condition since it's a life-threatening disease. The leading cause of the disease is smoking which has affected many people worldwide (Vogelmeier et al., 2020). The cure for the disease has not been found, but the condition is easily prevented at an early stage. Many people live with the disease early and experience some minor lung complications. Patients ignore treatments and medication without realizing the condition is causing lung complications. If the disease is discovered initially, it can easily be treated and prevented. Different therapies and drugs do not fully control the situation, but they reduce the severity of the condition. Care and attention should be close to ensure the patient is well supported to increase the quality of life. People with COPD should work closely with their doctors

to be exposed to different activities to prevent the disease and avoid readmission. The health sector should enlighten people on the danger caused by smoking and exposure to dust and fumes, which are the risk factors associated with the occurrence of the disease.

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