

PATHOGENESIS ANALYSIS, RISK FACTORS, AND MANAGEMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A LITERATURE STUDY

I Nyoman Muliase

Regional General Hospital Anuntaloko Parigi, Indonesia

Email: muliase.m@gmail.com

Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a lung condition that slowly narrows the airways, impairs gas exchange, and causes difficulty breathing. The main risk factors for COPD include smoking, exposure to air pollution, genetics, and exposure to hazardous work environments. Pathogenesis analysis revealed the role of chronic inflammation and damage to lung tissue due to exposure to toxic substances. This research was conducted using a literature study methodology to analyze the pathogenesis, risk factors, and management of COPD. This research approach involves collecting, selecting, and analyzing literature from various reliable sources, such as scientific journals, research articles, and books related to COPD. The first step is to identify the research objectives, namely to analyze the mechanism of pathogenesis, risk factors, and COPD management strategies. Then, the relevant literature sources were collected and analyzed systematically. This research focuses on understanding how exposure to smoking and air pollution contribute to inflammation and damage to lung tissue in the pathogenesis of COPD. In addition, other risk factors such as genetics and work history are also analyzed in the context of the development of this disease. The results of the analysis show that quitting smoking, avoiding exposure to air pollution, using drugs, and changing lifestyles are the recommended approaches in COPD management. Psychological support and pulmonary rehabilitation also have an important role in improving the patient's quality of life. By combining the results of literature analysis and a literature review research methodology approach, this study provides a comprehensive view of COPD pathogenesis, risk factors, and management strategies.

Keywords: Pathogenesis, Risk Factors, Management, Chronic Obstructive Pulmonary Disease

INTRODUCTION

Based on Soeroto & Suryadinata, (2014), Chronic Obstructive Pulmonary Disease (COPD) is one of the chronic diseases that poses a significant health burden worldwide. COPD is a respiratory condition characterized by chronic and progressive narrowing of the airway, causing impaired airflow that is difficult to stop

(Baraldo et al., 2012). This disease is included in the category of non-infectious lung diseases that most commonly occur and has a serious impact on the quality of life of patients and incurs high health service costs (Yudhawati & Prasetyo, 2019).

COPD is primarily associated with long-term exposure to respiratory irritants, especially cigarette smoke, indoor and outdoor air pollutants, and genetic factors (Elonheimo et al., 2022). As the global population ages, the prevalence of COPD is expected to continue to rise, making it an increasingly urgent public health issue to address.

The study of the pathogenesis of COPD is very important in the effort to understand the biological processes underlying the development of this disease. Knowing the mechanisms of chronic inflammation, structural damage to the lungs, and the role of inflammatory enzymes and mediators in COPD will provide better insight into the development of treatment and prevention strategies.

COPD risk factors are integral to understanding the disease (Roversi et al., 2016). Secondhand smoke exposure is a major risk factor, but other factors such as air pollution, occupations that involve exposure to toxic chemicals, and family history also have a significant role in the increased risk of developing COPD. The introduction of these risk factors provides a foundation for public intervention and education efforts to reduce the incidence of COPD in the future.

The management of COPD includes a holistic approach, including pharmacological therapy, respiratory rehabilitation, symptom management, and lifestyle changes. A deep understanding of the management of COPD from various aspects, including the application of bronchodilator therapy, inhaled corticosteroids, and non-pharmacological strategies such as controlled physical exercise and psychosocial support, has a major impact on improving the quality of life of patients.

In this context, an in-depth study of the pathogenesis, risk factors, and management of COPD through literature analysis aims to compile a comprehensive picture of the development of this disease. Through careful review of the literature, scientific discoveries and recent developments in the field of COPD can be identified, analyzed, and gained a deeper understanding.

RESEARCH METHODS

The research methodology "Analysis of Pathogenesis, Risk Factors, and Management of Chronic Obstructive Pulmonary Disease: A Literature Study" involves an in-depth review of the existing literature to reveal the essence of the disease (Sueyoshi et al., 2017). The first step is to collect literature sources from various reliable sources such as scientific journals, research articles, and books related to Chronic Obstructive Pulmonary Disease (COPD) (Lareau et al., 2019). Once the literature is collected, researchers select and organize the material based on key aspects, such as the pathogenesis of COPD, contributing risk factors, and identified management strategies. From this analysis, the study will summarize significant findings in the final report, providing a deeper understanding of how the disease progresses, the factors that influence it, as well as the steps that can be taken in its management.

RESULTS AND DISCUSSION

Pathogenesis Analysis of Chronic Obstructive Pulmonary Disease

Analysis of the pathogenesis of Chronic Obstructive Pulmonary Disease (COPD) involves an in-depth understanding of the developmental process and mechanisms underlying this condition (Soemarwoto et al., 2019). COPD is a chronic lung disease characterized by narrowing of the airways and impaired gas exchange, resulting in difficulty breathing (Rosha & Dewi, 2018).

One of the main factors in the pathogenesis of COPD is long-term exposure to toxic substances in cigarette smoke. Cigarette smoke induces chronic inflammation in the airways, resulting in structural and functional changes in lung tissue. This inflammation leads to hypersecretion of mucus and increased production of enzymes that damage lung tissue. This can lead to a decrease in tissue elasticity and damage to the walls of the alveoli, which are responsible for gas exchange. In addition, this inflammatory reaction can also trigger an immune response that contributes to the worsening of the disease.

Other risk factors include exposure to air pollution, industrial chemicals, and genetics. An imbalance between protease and antiprotease proteins in the lungs can cause damage to tissues. Over time, this damage leads to increased narrowing of the airways and symptoms of shortness of breath typical of COPD.

Analysis of the pathogenesis of COPD results in a deeper understanding of how these factors interact with each other and contribute to disease progression (Hikichi et al., 2019). With this understanding, COPD management can be more targeted and effective, integrating preventive measures, symptom management, and appropriate treatment.

Risk Factors for Chronic Obstructive Pulmonary Disease

Risk factors that contribute to the development of Chronic Obstructive Pulmonary Disease (COPD) are various conditions or exposures that can increase a person's chances of developing the disease. COPD is a chronic lung disease characterized by narrowing of the airways, causing breathing difficulties and disturbances in gas exchange in the lungs.

Smoking tobacco is one of the main risk factors for COPD (Salawati, 2016). Long-term exposure to harmful substances in cigarette smoke results in chronic inflammation in the airways and damages lung tissue. The longer and more often a person smokes, the greater their risk of developing COPD. In addition, exposure to outdoor and indoor air pollution is also a significant risk factor. Air pollution from sources such as vehicle, industrial, or wood-burning fuels can damage the lungs and worsen COPD symptoms.

Genetic factors also have a role. Some individuals may have genetic susceptibility that makes them more susceptible to the effects of smoking or exposure to air pollution. A history of work that involves exposure to dust, smoke, or harmful chemicals can also increase the risk of COPD (Richard & Amouyel, 2001). Lastly, factors such as a history of frequent respiratory infections or passive exposure to secondhand smoke from others can also contribute to the development of the disease. An understanding of these risk factors is important in efforts to prevent and manage COPD.

Management of Chronic Obstructive Pulmonary Disease

Management of Chronic Obstructive Pulmonary Disease (COPD) is an approach that focuses on reducing symptoms, slowing progression, and improving quality of life for individuals affected by this condition (Dewi & Herawati, 2023). Because COPD is a chronic lung disease that cannot be completely cured, this management approach aims to provide holistic, coordinated care to ensure patients have the best possible daily life.

One of the first steps in the management of COPD is to stop smoking and avoid exposure to secondhand smoke (van Koeverden et al., 2015). This is very important because smoking is a major cause of the disease and quitting smoking can slow the progress of the disease. The use of drugs is also a key element in management. These include bronchodilators, which help dilate the airways and facilitate breathing, as well as inhaled glucocorticoids that reduce inflammation in the lungs.

In addition, the holistic approach also includes lifestyle aspects. Adopting a healthy diet, exercising regularly, and maintaining a clean and air pollution-free environment can help improve physical condition and overall well-being (Ajibade et al., 2021). A pulmonary rehabilitation program, which includes physical exercise and controlled breathing, can help patients improve their cardiorespiratory condition.

In addition to the physical aspect, the management of COPD also pays attention to the mental well-being of patients. Psychological support or support groups can help individuals deal with the challenges and stress associated with this chronic disease. Having a plan of action in place of exacerbations (peaks of more severe symptoms) is also important to cope with emergency situations.

Overall, COPD management is a collaborative effort between patients and health care teams. By combining medical approaches, lifestyle changes, physical rehabilitation, and mental support, individuals affected by COPD can lead better lives despite having chronic illnesses.

CONCLUSION

Chronic Obstructive Pulmonary Disease (COPD) is a health condition that involves narrowing of the airways and impaired gas exchange in the lungs, resulting in breathing difficulties and impacting quality of life. COPD is generally caused by risk factors such as tobacco smoking, exposure to air pollution, genetic factors, a history of respiratory infections, and a history of certain occupations.

Analysis of the pathogenesis of COPD revealed that chronic inflammation in the airways and damage to lung tissue are at the core of the development of the disease. Long-term exposure to harmful substances in cigarette smoke is a major trigger for this inflammation and damage.

However, there are efforts that can be made in the management of COPD. Quitting smoking and avoiding exposure to risk factors are key steps in stopping further damage to the lungs. The use of medications, respiratory therapy, physical rehabilitation, healthy lifestyle changes, and psychological support are also important components in managing symptoms and slowing the progression of COPD.

The importance of collaboration between patients and health care teams in the management of COPD is undeniable. By combining medical measures, lifestyle changes, mental support, and emergency action plans when exacerbations occur,

individuals affected by COPD can improve their quality of life and better face the challenges of this chronic disease. Overall, an understanding of the pathogenesis, risk factors, and management of COPD provides a more comprehensive view of how the disease affects individuals and how appropriate steps can be taken to address its effects.

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