Medicina Biomedica Journal
Vol. 1, No. 2, July 2024, pp. 63 ~ 68
ISSN: 2827- 8275, DOI: 10.30596/mbj.v1i1

PROPORTION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN CORONARY HEART DISEASE PATIENTS AT THE HAJI ADAM MALIK GENERAL HOSPITAL MEDAN

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ABSTRACT

Chronic obstructive pulmonary disease and coronary heart disease are diseases that have several common risk factors, one of which is age and smoking habits. Research conducted by Enriguez et al. reported that CHD patients with COPD had a significantly increased risk of death after 1 year compared to patients with COPD. without COPD, meaning that finding the right diagnosis and appropriate treatment for CHD patients can improve the patient's quality of life and possibly reduce the mortality rate in CHD patients. This study aims to determine the proportion of chronic obstructive pulmonary disease in patients with coronary heart disease at the Haji Adam Malik General Hospital Medan. The research method is descriptive, the research sample is 40 samples, namely patients with coronary heart disease who are treated as outpatients at the cardiology clinic of Haji Adam Malik Hospital, Medan. After examining the history, questionnaire, and post-bronchodilator spirometry, it was found that the proportion of COPD patients in CHD patients was 27.50%. This study of the proportion of COPD in patients with coronary heart disease is quite high as much as 27.50%, so it is necessary for clinicians to carry out pulmonary function examinations in CHD patients, especially those who have risk factors for COPD so that clinicians can determine the appropriate management for the patient.

Keyword : Coronary heart disease, Chronic obstructive pulmonary disease

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1. INTRODUCTION

Chronic obstructive pulmonary disease and chronic heart disease have a high prevalence worldwide and their incidence increases with age. The Global Burden of Disease program estimates that COPD causes the deaths of at least 2.9 million people per year. COPD was the sixth leading cause of death in 1990, the fourth leading cause of death since 2000, and is expected to be the third leading cause of death by 2020.3 By 2030, COPD is estimated to be the direct cause of all deaths by 7.8% and 27% of smoking-related deaths and 33% death from cancer and 29% due to cardiovascular disease.

2. METHOD

Chronic Obstructive Pulmonary Disease is a preventable and treatable disease generally characterized by persistent or persistent airflow limitation that is usually progressive and

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associated with an increased chronic inflammatory response in the airways and lungs to noxious particles/or gases. Exacerbations and comorbidities overall contribute to patient severity. Coronary heart disease is also known as the atherosclerotic disease is the end result of the accumulation of atheromatous plaques on the walls of the coronary arteries.

Chronic obstructive pulmonary disease and coronary heart disease have high morbidity and mortality rates in the world. These two diseases often appear simultaneously because they have the same risk factors. In 1990 COPD was the sixth leading cause of death, in 2000 it was the fourth leading cause of death and is expected to be the third by 2020, and 27% of deaths are related to smoking, about 33% due to lung cancer, and 29% due to cardiovascular disease. Large population-based studies have shown that COPD patients with cardiovascular disease have a two to three times greater risk of mortality, whereas those with coronary heart disease with COPD have twice the risk of mortality.

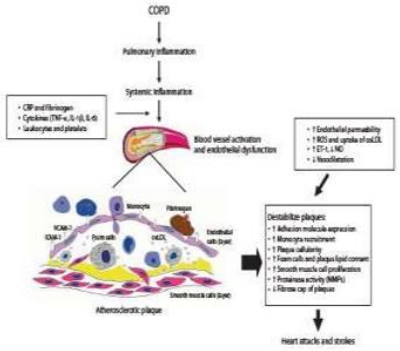

Figure 1. Mechanism of systemic inflammation in COPD on the Cardiovascular system[7]

Mechanisms of Systemic Inflammation in COPD and Atherosclerosis

The pathogenesis of atherosclerosis is complex and multifactorial. Mild systemic inflammation is important in initiating plaque formation and the development of atherosclerotic disease. Several epidemiological studies have linked systemic inflammation to the extent of atherosclerosis, ischemic heart disease, stroke, and coronary death. An important step in initiating atherosclerotic plaque is the activation of the vascular endothelium. Inflammatory conditions such as diabetes, COPD, or obesity cause the endothelium to overexpress surface adhesion molecules such as VCAM-1 which allows circulating white blood cells to adhere to the activated endothelial surface, triggering a whole series of inflammatory reactions in the vessel wall.

Some molecules such as CRP can increase the inflammatory process. C-reactive protein (CRP) can increase the regulation of the production of inflammatory cytokines, activate the complement system, increase the uptake of LDL by macrophages and help the attachment of leukocytes to the endothelium of blood vessels, thereby expanding the inflammatory reaction in the blood vessel walls. C-reactive protein (CRP) also interacts with endothelial cells and stimulates the production of IL-6, MCP-1, and endothelin-1, which alter the function of the vascular endothelium. The Framingham study showed CRP levels <1.1 to 3.3 mg/L were associated with mild, moderate, and severe cardiovascular events. Other acute-phase proteins such as fibrinogen also predict cardiovascular events. The standard difference between CRP levels in COPD patients and the control group was 1.86 mg/L, while for fibrinogen it was 0.37 g/L.

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The mechanism of COPD and its effects on the cardiovascular system are not known with certainty, but a mild systemic inflammatory reaction associated with COPD plays a role in the atherothrombotic cardiovascular disease in these patients. It is suspected that COPD is associated with airway and lung inflammation leading to the direct or indirect release of proinflammatory mediators such as acute phase proteins, cytokines, and chemokines into the bloodstream. These mediators induce a persistent systemic.

Figure 3 shows a potential pathway for systemic inflammation in COPD to activate blood vessels resulting in activation and endothelial dysfunction and instability of atherosclerotic plaques that can lead to events such as acute coronary syndromes and stroke.

3. RESULTS

The research sample consisted of 40 samples, namely CHD patients who were in the Cardiology Outpatient Clinic at H. Adam Malik Hospital Medan from July 2014 to October 2014.

Table.1 Proportion of COPD in CHD Patients

COPD Status	N	%
CHD with COPD	11	27.50
PJK without COPD	29	72.50
Total	**40**	**100.00**

From the table above, the proportion of COPD in CHD patients is 27.50%.

Table 2. Distribution of COPD status in CHD patients

CHD status	N	%
NSTEMI	14	35.00
OMI	2	5.00
Post PCI	21	52.50
STEMI	3	7.50
Total	**40**	**100.00**

Judging by CHD status, it was dominated by post PCI CHD status as much as 52.50% (21 people) and NSTEMI 35.00% (14 people), STEM 7.50% (3 people), and 5% OMI (2 people).

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Table 3. COPD status is associated with CHD status

CHD Status	PJK Status				Total
	CHD with COPD		PJK without COPD		
	n	%	N	%	N
NSTEMI	2	18,20	12	41.40	14
OMI	0	0.00	2	6.90	2
Post PCI	9	81.80	12	41.40	21
STEMI	0	0.00	3	10,30	3
Total	**11**	**100.00**	**29**	**100.00**	**40**

The table above shows that 81.80% (9 people) were CHD with COPD with CHD status being post PCI and 18.20% (2 people) were CHD with COPD with NSTEMI CHD status, meanwhile 41.40% (12 people)

4. Discussions

Chronic obstructive pulmonary disease and coronary heart disease have the same risk factors, namely age and exposure to cigarette smoke, but until now the mechanism of the relationship between chronic obstructive pulmonary disease and coronary heart disease is still unclear, only on prevalence, but systemic inflammation, oxidative stress, and hypoxemia. plays an important role in coronary heart disease. Coronary heart disease with COPD is a disease that has the same risk factors, getting the right diagnosis and management of these two diseases will be able to improve the quality of life of patients and reduce morbidity or mortality from these two diseases. Where according to Sin et al in several studies the two influence each other and have independent factors in increasing the mortality rate of these two diseases.[1,,2,3,10]

In this study, there were 40 samples of CHD sufferers who were treated as outpatients at the Cardiology clinic of H. Adam Malik Hospital, Medan from July 2014 to October 2014. Based on gender, there was 92.50% male and only 7.50% female, and 100% diagnosed with CHD COPD (11 people) were all male. In a study conducted by Joan et al, 83.3% of patients with CHD with COPD were male.4In the United States, CHD symptoms before the age of 60 are found in 1 in 5 men and 1 in 17 women. This means that men have a risk of CHD 2-3 times greater than women, and in this study, patients with CHD with COPD were men who had a smoking habit where men and smoking were risk factors for the occurrence of these two diseases.[4,5]

Based on the most, the 40-50 age group was 45.50% (5 people) and the 51-60 age group was 27.30 (3 people) and the age group > 60 was 27.30% (3 people) in accordance with the risk factors for the occurrence of COPD and CHD are age above 40 years. In this study, all respondents aged over 40 years are risk factors for the occurrence of COPD and CHD. Several studies have reported an association between age and death from CHD. Most cases of death occurred in men aged 35-44 years and increased with increasing age.[2,3,6]

Based on this study, it was also found that 100% of CHD patients with COPD were ex- smokers, in this study 11 CHD patients with COPD had a Brinkman index of 81.8% (9 people) with a severe Brinkman index and 18.20% (2 people). with a moderate Brinkman index. Smokers have the same risk factors for the occurrence of CHD and COPD, where cigarette smoke will cause local inflammation in the lungs and can also cause systemic effects because the local inflammation in the lungs will cause pulmonary inflammatory mediators to enter the systemic circulation which can cause disturbances. Systemic one of which is coronary heart disease. Research conducted by Suwa et al showed that rabbits that were high in fat experienced

atherosclerosis after being exposed to harmful particles and showed a systemic inflammatory reaction, meaning that patients with CHD with smoking or with COPD will further aggravate coronary heart disease, smokers have a 3 to 4 times greater risk of developing this disease than non-smokers. Smoking interacts with other risk factors such as high blood pressure, cholesterol, and diabetes. The Framingham study found that sudden death from CHD in male smokers was 10X greater than in nonsmokers and in female smokers 4.5X more than in nonsmokers. The effect of smoking is to cause an increase in myocardial burden due to stimulation by catecholamines and a decrease in 02 consumption due to inhalation of CO.[5,7]

Based on the results of this study, it was also found that 90.9% of patients with COPD had respiratory complaints of shortness of breath and chronic cough, and only 9.10% (1 person). This is in accordance with the degree of MMRC where 81.80% (9 people) with MMRC grade 3 and as
many as 18.20% (2 people) with MMRC grade 4 are CHD patients with COPD. Respiratory symptoms in patients with COPD are shortness of breath and chronic cough.2 This is in accordance with clinical guidelines, diagnostics, and management of COPD, where the clinical symptoms of COPD include shortness of breath and chronic cough that are progressive in nature.[2,6]

Based on spirometry results, 100% (11 people) were CHD patients with COPD with a combination of obstructive and restrictive pulmonary function interpretation, 44,80% (13 people) were CHD patients with normal interpretation and 27.60% (8 people)) with restrictive pulmonary function interpretation. This is in accordance with research conducted by Marcus et al. The results of this study are that there is a relationship between decreased lung function with the incidence of CHD.

Based on CHD status in this study, it was found that 81.80% (9 people) were CHD patients with COPD with POST PCI status, where all CHD patients with COPD were correspondents who had high-risk factors for COPD, of which 9 people had COPD- PS with a score above > 5 and all former smokers with a heavy Brinkman index. And only 18.20% (2 people) are CHD patients with COPD who have NSTEMI CHD status, there is no theory that can explain the relationship between COPD and CHD diagnosis status, which is only limited to prevalence according to research conducted by Faris Muntana et al found 44% of the 59 study samples diagnosed with COPD in patients with CHD with post-CABG CHD status, meaning that the more severe the CHD is and the relationship with COPD, COPD has chronic inflammation that can cause persistent systemic effects. research conducted by Wakabashi et al found that COPD is a strong predictor of severity in CHD patients.[8,9]

Many studies have reported mortality rates in COPD patients with cardiovascular compared to those without COPD. In the follow- up of 4,2284 coronary heart patients who received hospitalization, there was a 21% mortality rate of patients with COPD compared to 9% without COPD. In this study, the proportion of COPD in CHD was found to be 27.50% (11 people) were CHD with COPD. Several studies conducted by Muntana et al of 56 patients with CHD found 44% diagnosed with COPD and the Soriono study reported a prevalence of COPD of 33.6% in 119 patients with CHD who had regular treatment from October 2006 to June 2008.[3,8]

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