

CHAPTER 1

INTRODUCTION

1.1 Research Background

Non-communicable diseases (NCDs) are chronic diseases that are not transmitted from person to person, including heart disease, stroke, cancer, diabetes, and Chronic Obstructive Pulmonary Disease (COPD). Non-communicable diseases account for nearly 70% of deaths worldwide. According to the Ministry of Health in 2017, in 56.9 million deaths worldwide, more than half (54%) were caused by 10 leading disease. Nationally, the top ten causes of death are cerebral vascular disease (21%), ischemic heart disease (12.9%), diabetes mellitus (6.7%), tuberculosis (5.7%), hypertension with complications (5.3%), chronic lower respiratory tract disease (4.9%), liver disease (2.7%), transportation accidents (2.6%), pneumonia (2.1%) and diarrhea (1.9%). The world's leading killer diseases are ischemic heart disease and stroke, and were responsible for a 15.2 million deaths in 2016.¹

Based on Basic Health Research (RisKesDas) 2018 data, the prevalence of coronary heart disease as the main cause of acute coronary syndrome in Indonesia is 1.5%, with the highest prevalence ranking in North Kalimantan Province at 2.2%, Special Region of Yogyakarta at 2% and Gorontalo at 2%.² The mortality rate in Indonesia for patients hospitalized for acute coronary syndrome is 32.3%, which is one of the highest rates worldwide.³

Heart attack can occur when the flow of oxygen-rich blood is cut off, if the blood flow is not restored quickly then parts of the heart muscle will begin to die. Without prompt treatment, a heart attack will cause serious

¹ Dwi Wahyu Nugroho, Pingky Sukmawati, and Yana Utami, "Analisis Biaya Pengobatan Pasien Penyakit Jantung Koroner Dengan Penyakit Penyerta Di Rumah Sakit."

² Kementerian Kesehatan Republik Indonesia, "Laporan Riskesdas 2018 Nasional," n.d.

³ "Analisis Biaya Pengobatan Penyakit Jantung Koroner Pada Pasien Rawat Inap Di Rumah Sakit X," *Medical Sains : Jurnal Ilmiah Kefarmasian* 4, no. 2 (March 31, 2020): 137–44, <https://doi.org/10.37874/ms.v4i2.132>.

health problems and may even result in sudden death. One of the clinical manifestations of coronary heart disease is acute coronary syndrome N-STEMI (Non-ST Elevation Myocardial Infraction). Therapies for the disease include four categories: anti-ischemic drugs, antiplatelets, anticoagulants, and coronary revascularization.⁴

Coronary heart disease (CHD) occurs when oxygen supply to the heart is reduced due to blockage or narrowing of the coronary arteries due to atherosclerosis, spasm, or combination of both. The number of coronary heart disease diagnoses from the web-based Non-Communicable Disease (NCD) information system reached 4,920 cases in total, 2,320 cases in men and 2,600 cases in woman. Based on the number of diagnoses by age group, there were 2,228 people in the elderly group (60 years and over). According to the Hospital Information System (SIRS), there are more cases of men than women hospitalized for coronary heart disease such as 32.314 acute myocardial infarction cases and 18.846 ischemic heart disease cases in Indonesia. Based on age group, the most cases of coronary heart disease in hospitals occurred in the age group of 45 to 64 years old as many as 29,074 cases. Based on provincial data, Central Java Province is the province with the highest number of coronary heart disease cases, totaling 7,737 cases.⁵

Treatment for cardiac patients are very diverse, making the selection of therapy in cardiac patients need to be considered in terms of effectiveness and cost. One of the therapies is antiplatelet drugs. Antiplatelets are drugs that can inhibit platelet aggregation, cause inhibition of thrombus formation, that found in the arterial blood vessels. As mentioned in the hadist:

حَدَّثَنَا هَارُونُ بْنُ مَعْرُوفٍ، وَأَبُو الطَّاهِرِ، وَأَحْمَدُ بْنُ عِيسَى، قَالُوا حَدَّثَنَا ابْنُ وَهْبٍ، أَخْبَرَنِي عَمْرُو، - وَهُوَ ابْنُ الْحَارِثِ - عَنْ عَبْدِ رَبِّهِ بْنِ سَعِيدٍ، عَنْ أَبِي الرَّبِيعِ، عَنْ جَابِرٍ، عَنْ رَسُولِ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ أَنَّهُ قَالَ " لِكُلِّ دَاءٍ دَوَاءٌ فَإِذَا أُصِيبَ دَوَاءُ الدَّاءِ بَرَأَ بِإِذْنِ اللَّهِ عَزَّ وَجَلَّ " .

⁴ Dina Catur Hapsari and Wara Kusharwanti, "Efektivitas Dan Keamanan Antikoagulan Pada Sindroma Koroner Akut Tanpa Elevasi Segmen St" 4 (2014).

⁵ "Buku Cara Praktis Belajar EKG Untuk Tenaga Keperawatan."

Meaning: Every disease has a cure, and when the disease is given a cure, it is cured with the permission of Allah SWT.⁶

Thus, the selection of appropriate treatment of heart disease is part of human efforts as recommended in Islamic teachings. Therefore, in addition to considering the effectiveness of therapy in treating heart disease, it is also important to analyze the cost-effectiveness of using antiplatelet drugs.

Cost-effectiveness analysis is one example to evaluate the comparison between benefits or health and the cost aspects used in health services. Cost analysis in pharmacoeconomic is used to compare cost effectiveness through the use of treatment in certain diseases with the aim of knowing which drugs or therapies are more cost-effective.

1.2 Research Problem

The problem formulation of this research is as follows:

1. How is the cost of using antiplatelet drugs in patients with acute coronary syndrome at Moewardi Hospital?
2. How is the effectiveness of aspirin monotherapy and aspirin-clopidogrel combination therapy in patients with acute coronary syndrome at Moewardi Hospital?
3. 3. How is the comparison of the cost effectiveness value of aspirin monotherapy and aspirin-clopidogrel combination therapy in patients with acute coronary syndrome at Moewardi Hospital based on the Average Cost Effectiveness Ratio (ACER) and Incremental Cost Effectiveness Ratio (ICER)?

⁶ “Sahih Muslim 2204 - The Book of Greetings - كتاب السلام - Sunnah.Com - Sayings and Teachings of Prophet Muhammad (صلى الله عليه و سلم).”

1.3 Research Objective

The objectives of this research are as follows:

1. Knowing the total cost of aspirin monotherapy and aspirin-clopidogrel combination in patients with acute coronary syndrome at Dr. Moewardi Hospital.
2. To determine the effectiveness of aspirin monotherapy and the combination of aspirin- clopidogrel in patients with acute coronary syndrome at Dr. Moewardi Hospital.
3. Knowing the cost effectiveness of aspirin monotherapy and combination therapy aspirin- clopidogrel in patients with acute coronary syndrome at Dr. Moewardi Hospital based on Average Cost Effectiveness Ratio (ACER) and Incremental Cost Effectiveness Ratio (ICER).

1.4 Research Benefits

1. Theoretical Benefits

The results of this research can provide science and benefits, especially in providing information related to the cost of antiplatelet drugs. Knowing the cost effectiveness of aspirin monotherapy and the combination of aspirin-clopidogrel drugs in patients with acute coronary syndrome.

2. Practical Benefits

The results of this study are expected to provide information in determining appropriate antiplatelet combination therapy related to effectiveness and cost for patients with acute coronary syndrome.

1.5 Authenticity Research

Research on cost-effectiveness analysis in acute coronary syndrome patients has been conducted by several researchers as shown in table 1 below :

Table 1 Authenticity Research

Research Title	Research Methods	Variables	Results	Research Differences
Analysis of the effectiveness and cost of dual anti platelet ticagrelor aspirin compared to clopidogrel aspirin in patients with acute coronary syndrome at Cipto Mangunkusumo Hospital for the period 2014-2016. ⁷	This study used a retrospective cohort design	Dependen : Dual anti-platelet ticagrelor-aspirin and clopidogrel-aspirin. Independen : Decrease in the incidence of Major Adverse Cardiovascular Events (MACE), decrease in the incidence of side effects and total costs	The results showed that the more cost-effective therapy was aspirin-ticagrelor combination therapy which was more effective in preventing MACE (major adverse cardiovascular events) in the first 3 months with ICER = Rp 279,438.87.	Dependen : Aspirin-clopidogrel combination therapy and aspirin monotherapy. Independen : Decrease in PT APTT score Decrease in ECG values Cost effectiveness analysis (CEA) method.
Cost Effectiveness Analysis of Enoxaparin and Fondaparinux Therapy in Hospitalized N-STEMI Cardiac Patients at	descriptive observational through the explanation of conditions that are carried out systematically according to the facts and	Dependen : Enoxaparin and Fondaparinux therapy. Independen : Comparison of length of	results obtained which is more Cost-Effectiveness is fondaparinux with ACER value = Rp. 4,257,706.37 while enoxaparin with ACER value = Rp.4,319,185.05/day in the treatment of N-STEMI	Dependen : Combination therapy of aspirin-clopidogrel and aspirin monotherapy Independen :

⁷ Novita Mawar Hadini, "Analisa Efektivitas Dan Biaya Dual Anti Platelet Ticagrelor Aspirin Dibandingkan Klopido-grel Aspirin Pada Pasien Sindrom Koroner Akut Di RSUPN Cipto Mangunkusumo Periode 2014 2016 = Cost Effectiveness Analysis Dual Anti Platelet Ticagrelor Aspirin versus Clopidogrel Aspirin in Patients with Acute Coronary Syndrome in Dr Cipto Mangunkusumo Hospital during 2014-2016."

K.R.M.T. Wongsonegoro Hospital. ⁸	characterize the objects and subjects studied correctly.	stay and duration of therapy and total costs from the results obtained	heart patients at K.R.M.T. Wongsonegoro Hospital.	Decrease in PT APTT score Decrease in ECG values Cost effectiveness analysis (CEA) method.
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⁸ Tew et al., "Geospatial Analysis Of Distribution Of Community Pharmacies And Other Health Care Facilities Providing Minor Ailments Services In Malaysia."