Patient Responsiveness to Cardiovascular Drug Therapies

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Research Article

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Abstract

Background: Cardiovascular Disease or Coronary Heart Disease (CHD) is currently one of the leading causes of death in developed and developing countries. CHD is the heart and blood vessel disease caused by narrowing of the coronary arteries. Narrowing of the arteries due to atherosclerosis process. The main therapy is the administration of antiplatelet, antithrombin, antihyperlipidemia, antihypertensive. Standard in order to take place in an optimal treatment of CHD, it is necessary to constantly monitor the system and monitor the patient receiving drug therapy. Therefore it is necessary for the monitoring of drug therapy in general and in particular the influence of creatinine clearance decline in geriatric patients suffering from CHD. To assess patient response to therapy cardiovascular and clinical outcomes of patients. Study was conducted by the method of longitudinal prospective 4-week cardiology patients. All data obtained from the patient's medical record. Patients were followed up every day and see the clinical outcomes of patients when patients go home from the hospital. Statistic analysis performed using non-parametric test. During the study period found 40 people patients with a diagnosis of which 27 were patients diagnosed with Acute Coroner syndrome (67.5%), and 8 patients were diagnosed with Congestive cardiac failure (20%), and 3 patients with Unstable Angina (7, 5%), and 1 patient with Ischemic Heart Diseases (2.5%), and 1 patient with Non-ST Elevation Myocardial Infarction (2.5%). Generally comes from the Malay race 35 patients (87.5%) and Chinese race 5 patients (12.5%). Of the total patients with a history of smoking are generally 31 patients were smokers (77.5%) and 9 patients were not smokers (22.5%).

Found the average age was 59.53 ± 12.675. Length of stay of patients on average 4.15 ± 1.231. Provided that antiplatelet therapy, antithrombin, antihyperlipidemia, antihypertensive. Statistically, no association between the sociodemographic diseases (P> 0.05). Drug therapy given to cardiology patients is appropriate. Where the patients showed good response to therapy, can be seen from the disappearance of clinical symptoms of patients. Clinical outcome improves in the patient upon receiving effective treatment .

Keywords: cardiovascular disease, acute coronary syndrome, unstable angina, NSTEMI, antipletelet.

Introduction

The cardiovascular system is one of the most important systems in the body because there are no cells and tissues that can function properly without the presence of oxygen and blood supply is sufficient. If there are problems with the heart, then the whole body will be very affect[1]. Coronary heart disease (CHD) is the heart and blood vessel disease caused by narrowing of the coronary arteries. Narrowing of the arteries due to atherosclerosis or spasm of the process or combination of both. Atherosclerosis that occurs due to accumulation of cholesterol and connective tissue in blood vessel walls slowly, it is frequently characterized by complaints of chest pain [2].

Acute Coronary Syndrome (ACS) is one of the major clinical manifestations of CHD and the most frequent cause of death. ACS is a progressive CHD course of their illness, often abruptly changes from a stable into an unstable state or acute [3]. Mechanism of the ACS is caused by the reduction of oxygen supply from the acute or sub acute infarction, which is triggered by the presence of atherosclerotic plaques and tears associated with the inflammatory process, thrombosis, vasoconstriction and micro embolism. ACS clinical manifestations may include unstable angina pectoris / APTS, Non-ST elevation myocardial infarction / NSTEMI, or ST elevation myocardial infarction / STEMI[4].

ACS is a term or terms used to describe a condition or disease process that includes a collection of unstable

angina pectoris / APTS (unstable angina / UA), myocardial infarction without ST segment elevation (non-ST elevation myocardial infarction / NSTEMI), myocardial infarction with ST segment elevation (ST elevation myocardial infarction / STEMI) 4. APTS and NSTEMI visible blood vessels do not have total occlusion or total occlusion did not (patency), and so we need to prevent the progression of plaque stabilization, thrombosis and vasoconstriction. APTS and NSTEMI is ACS characterized by an imbalance of supply and myocardial oxygen demand. The main cause is coronary stenosis due to non-occlusive thrombi that occur in atherosclerotic plaque erosion, fissure, and ruptur[5].

Describes recent developments of atherosclerosis is an inflammatory process or infection, which was initially characterized by abnormalities early in the endothelial layer, the formation of foam cells and fatty acids, the formation of fibrous lesions cups and more, as well as the rupture of unstable atherosclerotic plaque. Many studies have show that inflammation as an important role in the process of aterosklerosis[4].

Paradigm of treatment or medical treatment strategy of patients ACS change and progress was made with the results of research on the pathogenesis of ACS and new management guidelines[5]. Progress in the medical therapy includes treatment for control of risk factors (dyslipidemia important for statins, antihypertension drugs, especially ACE-I drugs), antithrombolytic new drugs, anti-platelet, heart failure, and aritmia[6]. Various guidelines and treatment standards have been created for the management of patients with ACS, standards and strategies for treatment management of ACS patients in an optimal, effective and efficient in accordance with the guidelines or standards established therapies. So that need for a system or mechanism that continuously monitors drug therapy received by patient. Management of Drug Related Problems (DRPs) is a process that includes all the functions necessary to ensure the patient's drug therapy that is safe, affective and economically carried out continuously and assess patient response to therapy. DRPs management of its main functions are: to identify the issues associated with DRPs either potential or actual, to overcome the actual DRPs and prevent DRPs are potential[8].

Optimally implementation of Pharmaceutical Care (Pharmaceutical Care) in the management of patients with cardiovascular disease, which includes the management of DRPs is the right choice and strategic. In an effort to maximize the medicine response; the effectiveness of the drug to the patient [8]. It is important for pharmacy to understand the pathophysiology of cardiovascular disease because it serves as a reason for choosing drug therapy and expect a good response to medication to patients to reduce mortality from cardiovascular disease.

Material and Method

The research was conducted using longitudinal studies design and used methods of a prospective observational to gather information from data on patients of cardiology at the Hospital USM.

Source of Data
Data sources include data from patient medical records and interviewing the patients themselves if the patient is in a state that has begun to improve.

Types of Data
Type of data used is divided into 2 parts:

Data inclusion
Data is collected by way of recording patient medical record at the Hospital USM includes data such as patient age, gender, history of present illness, previous medical history, family history, previous drug history, therapeutic measures, diagnosis, physical examination, and investigations. The data taken was transferred to the data collection sheet that has been prepared.

Data exclusion
Data are not included as research data is the patient who died on the first day go to the hospital.
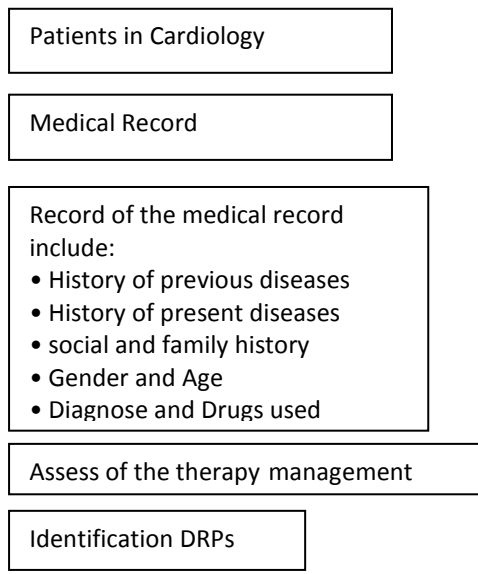
Procedure Research

Sample Determination Criteria
The population was all patients who suffer from cardiovascular disease in USM Hospital during the period 1st April 2012 to 31st Mei 2012.

Analysis of Data
Data were analyzed statistically with categorical data and continuous, and analyzed by chi-square and one way Anova.

Research Framework

Patients in Cardiology

Medical Record

Record of the medical record include:
• History of previous diseases
• History of present diseases
• social and family history
• Gender and Age
• Diagnose and Drugs used

Assess of the therapy management

Identification DRPs

Monitoring clinical outcomes include:
• Effect therapy, Side effects, Interactions with other drugs

Analysis :
• The disease suffered by patients, Drugs used
• The relationship of social demography of the type of disease, Clinical outcome, and drug related problems (DRPs)

Results

The results of research on the therapeutic management of cardiovascular disease and assess the patient's response to cardiovascular drugs in cardiology ward at the Hospital Universiti Sain Malaysia (HUSM) carried out from 1 April to 31 May 2012 are as follows:

Sociodemographic

This table describes the data sociodemographic of patients, including gender, race, age, smoking status, and duration of treatment of patients at the Hospital. The results indicate that patients suffering from cardiovascular disease that most were male (62.5%) whereas for women only (37.5%). Malay race to race get the most affected by cardiovascular disease (87.5%) whereas China (12.5%). smoking status obtained for patients with a history of smoking a lot of cardiovascular disease. For long day care of patients in the hospital was 5 days.

Characteristic Compare sociodemographic with diagnosis	N (%) / mean ± SD	P value
Gender		0.760
Male	25 (62.5)	
Female	15 (37.5)	
Race		1.000
Malay	35 (87.5)	
Chinese	5 (12.5)	
Smoker		0.833
Smoker	15 (37.5)	
No smoker	9 (22.5)	
Ex. Smoker	16 (40)	
Age	59.53 ±12.675	0.007
Length Of Stay	4.55 ±1.709	0.431

Figure 1. Diagram of the percentage of patients with cardiovascular disease by Gender in HUSM, Malaysia.
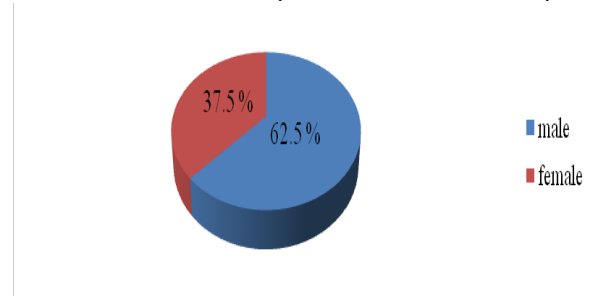

Figure 2. Diagram of the percentage of patients with cardiovascular disease by Race at the HUSM, Malaysia.
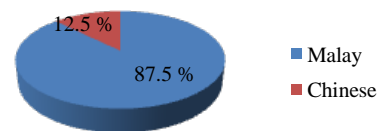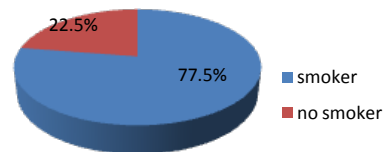

Figure 3. Diagram of the percentage of patients with cardiovascular disease based on smoking status at the HUSM, Malaysia

Clinical Characteristic
This table describes the types of cardiovascular disease and complications experienced by patients obtained a percentage (%) for diagnosis is a CCF of 20%, ACS 67.5%, IHD by 2.5%, 7.5% Unstable Angina and NSTEMI 2.5%, the majority of disease is ACS.

Characteristic	N (%)
Diagnosis	
CCF	8 (20)
ACS	27 (67.5)
IHD	1 (2.5)
Unstable Angina	3 (7.5)
NSTEMI	1 (2.5)

*CCF = Congestive Cardiac Failure
*ACS= Acute Coronary Syndrome
*IHD = Ischemic Heart Diseases
*NSTEMI = Non

Specific Sign Symptoms among Patient
This table describes the frequency of symptoms experienced by patients during treatment days in the hospital. Which can be seen that before getting the drugs patients experience symptoms such as Chest Pain, SOB, Palpitation, Nausea, Sweating, vomiting. But as long as the use of drugs the patient symptoms are gone 100%.

Characteristic Compare Specific Symptoms with Diagnosis	N (%)		P value
	Pre	Post	
Chest Pain	26 (65)	0 (100)	0.019
SOB	20 (5)	0 (100)	
Palpitation	19 (47.5)	0 (100)	
Nausea	12 (30)	0 (100)	
Sweating	11 (27.5)	0 (100)	
Vomiting	8 (20)	0 (100)	

Outcome Of Treatment
This table illustrates the percentage of N (%) of treatment outcome of patients with gender, discharge obtained with complication Female = 11 (27.5) & Female = 20 (50), and Discharge without complication Female = 4 (10) & Female = 5 (12.5)

Characteristic Compare clinical Outcome with diagnosis	N (%)		P value
	Female	Male	
Discharge with complication	11(27.5)	20(50)	0.000
Discharge without complication	4(10)	5(12.5)	

Discussion and Conclusion

Research on the management of cardiovascular disease therapy aims to see the response to therapy of patients obtained by the patient, during care at the Hospital and the rationality of drug used. Rational use of drugs is to use treatments that have been recognized and scientifically proven to take into account the benefits and risks of side effects. In addition, identification, assessment and resolution of drug related problems (DRPS) [9].

Patient Data overview Sociodemographic
Judging from the number of patients during the study period, obtained the number of patients hospitalized with cardiovascular disease are as many as 40 patients. The percentage of data on gender sociodemographic patients of 40 patients found that 62.5% of patients were male and 37.5% of female patients suffering from cardiovascular disease. Cardiovascular disease is often considered a disease of adult males. In fact, cardiovascular disease can strike anyone, both men and women. Cardiovascular diseases in men the same age as women who have entered menopause were more likely to occur. However, after menopause, women develop cardiovascular disease risk increased to nearly the same as the risk of men. Research has shown that after menopause, women are at increased risk of heart disease [10].

Researchers have linked this pattern to the decline in estrogens levels in women during menopause. Where a process beginning at age 50, estrogens is associated with the level of High Density Lipoprotein (HDL or "good cholesterol") are higher and lower levels of Low-Density Lipoprotein (LDL or "bad cholesterol"). Naturally occurring estrogens withdrawal at menopause causes a decrease in HDL and increase LDL thus increasing the risk of heart disease in women [11].

Statistically, using Chi-Square analysis, earned P value = 0.760. This suggests that gender had no significant association with cardiovascular disease, so patients can be said that men and women are equally at risk for cardiovascular disease.

Based on patient race, it was found that in general patients with Malay race who suffer from cardiovascular disease by a percentage that is 87.5% and 12.5% Malay race Chinese. From a study saying that the main cause of death in Malaysia in 2005 which is the heart or cardiovascular disease are more experienced by men. This is because the lifestyle of the people associated with the food. In recent decades not only to increase the amount of fatty foods, but also to changes in the composition of a diet and lifestyle.

Ministry of Health Malaysia carrying out public interventions that promote healthy lifestyles to be targeted to the entire population of Malaysia. It is also known that cardiovascular disease is preventable through lifestyle changes, particularly the modification of risk factors such as obesity, smoking, hypertension, hypercholesterolemia, and hyperglycemias [1].

Statistically, using Chi-Square analysis, earned P value = 1.000. This suggests that race has no significant association with cardiovascular disease, so it can be said that any race with patients at risk for cardiovascular disease. However, in this study found that most Malay races suffer from cardiovascular disease.

In the present study found that patients suffering from cardiovascular disease are the life span of 59.53 ± 12.675. 20 people found geriatric patients with age> 60 years and 20 adult patients. Heart disease in geriatric has a multifactorial cause overlapping. For that we must understand the concept of risk factors

and degenerative diseases. Risk factor is a habit, disorders and other factors which, if found / owned one will cause the person to be significantly more likely to suffer from certain degenerative diseases [12].

Statistically, using one-way ANOVA analysis obtained P value = 0.833. Can be interpreted that there is no significant relationship between age with cardiovascular disease. This indicated that there was no effect of age on diagnosis of patients, because of various risk factors experienced by each patient is different.

Judging from the patient's smoking history was found that 77.5% of patients with a history of smoking with cardiovascular disease. Where, every time someone smokes, the chemicals in cigarette smoke, nicotine and carbon monoxide in particular, will damage the cardiovascular system. Nicotine causes an increase in both short-and long-term blood pressure, heart rate, cardiac output and coronary blood flow. Carbon monoxide binds to haemoglobin, which works to bring oxygen from the lungs through the bloodstream, thereby reducing the amount of oxygen reaching body tissues [13].

Smoking also makes blood vessels and blood cells sticky, allowing the formation of harmful cholesterol and fatty material. This is called atherosclerosis, which can ultimately lead to increased blood pressure and clot formation. Studies have confirmed that smoking can cause damage to blood vessels. A study showed the arteries of people aged 15-34 years who died when the measure is full of fat deposition, thiocyanate and cholesterol levels in the blood vessels, is a marker for smokers. This study found that every person who had smoked more shows early signs of atherosclerosis than those who never smoked. In some cases, second-hand smoke has been identified as contributors to heart disease [14].

Statistically, using Chi-square analysis, obtained P values = 0.007 in this study. This indicated that a history of smoking had a significant association with cardiovascular disease. So it can be said that smoking is an important risk factor of cardiovascular disease [15].

Clinical Characteristics of Patient Data

Cardiovascular disease is a term that refers to more than one circulatory system diseases, including heart and blood vessels, both blood vessels in the lungs, brain, kidneys or other parts of the body 3. Judging from the data characteristics of the patient's clinical diagnoses found that the type of cardiovascular disease found in this study is complete, including 67.5% of patients diagnosed with Acute Coroner Syndrome (ACS) or acute coronary syndrome (ACS). SKA is one of the clinical manifestations of coronary heart disease (CHD) is the main and most frequent cause of death. It also found that 20% of patients diagnosed with Congestive cardiac failure (CCF) or congestive heart failure, 2.5% of

patients with Ischemic Heart Diseases (IHD) or ischemic heart disease, 7.5% of patients with Unstable Angina or angina pectoris stable, and 2.5% of patients with Non-ST Elevation Myocardial Infarction (NSTEMI).

Ischemic heart disease, unstable angina and NSTEMI are treated as a medical emergency. The third condition is closely associated with acute coronary syndrome, which means that all three are caused by plaque rupture in coronary arteries. In each type of ACS, it is important to rapidly stabilize cardiac ischemia produced by plaque rupture, and then take steps to stabilize the plaque [16]. The incidence of atherosclerosis is not simply caused by a single factor, but also compounded by many other factors such as hypertension, high lipid levels, smoking, and abnormal blood sugar levels. Where from this study found that 77.5% of patients with complications, such as by hypertension, hyperlipidemia, diabetes mellitus, and chronic renal failure [17].

From the analysis of the acceptable combination of drugs was found that among adult patient group receiving antiplatelet drugs, anti-thrombin, hypertension (Diuretics, Angiotension-Converting Enzyme (ACE) Inhibitors, Angiotension Receptor Blockers (ARBs), calcium channel blockers), hyperlipidemia, and anticoagulation.

American College of Cardiology (ACC) / American Heart Association (AHA) is a body charged with governing guidelines (guidelines) to make recommendations regarding diagnosis and treatment of patients with cardiovascular disease is already established or is suspected. Antiplatelet and antithrombotic therapy is very important to change the disease process and its development to be worse than acute coronary syndromes.

Getting the number of patients drug therapy Cardiovascular Drugs Used by Group

Patients treated with the diagnosis of cardiovascular disease, normal cardiac drug therapy. In the present study found that patients get the heart medication with a nitrate group, beta-lockers, and positive inotropic agents. The percentage of patients who get heart medication that is isosorbid dinitrate nitrate group of 22 patients (55%), class of positive inotropic agents are dobutamine 1 patients (2.5%), and the class of beta-blockers are metoprolol 6 patients (15%), atenolol 1 patients (2.5%), bisoprolol 2 patients (5%), carvedilol 1 patients (2.5%).

Cardiovascular Drug Therapy Used Nitric Patient Group

Nitrate compounds (isosorbid dinitrat) used in cardiovascular therapy because of its hemodynamic action of complement. Properties owned venodilator

nitrate compounds caused the reduction in preload phase. Moreover, nitrate also has the ability menginhibisi ventricular remodeling process and contributes to the prevention of heart disease severity [18]. Dinitrate isosorbid dose for adults, including parents in Intravenous is between 2 mg and 12 mg per hour. However, the dose to 20 mg per day administered should be adjusted to patient response. The dose for intra-coronary route generally is 1 mg given as a bolus injection prior to balloon inflation. Further doses may be administered does not exceed 5 mg in 30 minutes [19]. In this study it was found that the dose received by patients is 2 mg IV isosorbid dinitrate and 3 mg, for 10 mg tablet isosorbid dinitrate. So it can be said that the doses received by patients is appropriate.

Unwanted effects during administration isosorbid dinitrat are the effect on the nervous system disorders such as headache, dizziness, drowsiness. Heart problems such as tachycardia, angina pectoris aggravated. Vascular disorders such as orthostatic hypotension, collapse (sometimes accompanied by Brady arrhythmia and syncope). Gastrointestinal disturbances such as nausea, vomiting, heartburn. Skin and subcutaneous tissue disorders such as allergic skin reactions (e.g. rash), angioedema, and Stevens - Johnson syndrome and the effects of severe hypotension has been reported [20]. However, in this study did not reveal any undesirable effects or adverse events occur in patients.

Cardiovascular Drug Therapy Class Agents Used in Patients positive inotropic
Positive inotropic agent dobutamine is a compound that β1 and β2 receptor agonist with little effect on α1 receptors, the main effect arising usually vasodilatation. This compound has a fairly potent inotropic effects produce significant changes in heart rate. Initiation dose of 2.5 to 5 mcg / kg / min can be increased gradually until it reached 20 mcg / kg / min or more according to clinical response and hemodynamic of the patient before [19]. In this study patients received 250mg dose dobutamine infusion in 50 cc / hour

Cardiovascular Drug Therapy Group of β-blockers are used Patient
Beneficial affects of β-blocker compounds such as metoprolol, atenolol, bisoprolol, and carvedilol can be caused by a slowdown or detrimental ventricular of remodelling induced by sympathetic stimulation. Decrease myocyte death by necrosis or apoptosis induced by catecholamines, the onset of antiarrhythmic effect and prevention of effects caused by activation of the sympathetic nervous system. This class of drugs can consistently increase of left ventricular ejection fraction, lower LV mass, and reduced systolic and diastolic volumes [4, 20].

Initiation dose and dose regimen that targets have been tested on a large scale Clinically dose metoprolol initiation was 12.5 to 25 mg per day, the target dose of 200 mg per day. For dose atenolol 25-100 mg orally daily, for the initiation dose bisoprolol 1.25 mg daily dose, target dose 10 mg per day, and the initiation of carvedilol 3.125 mg dose twice daily, target dose 25 mg twice daily, in patients with body weight > 85 kg dose of 50 mg twice a day [18]. In the present study found that patients used a dose of bisoprolol was 2.5 mg, for 25 mg dose of metoprolol, atenolol 100 mg dose, and for doses of 12.5 mg carvedilol. Can been said that all patients get a dose of medication that is in conformity with the established guidelines. Side effects of this drug class in the myocardium are bradycardia, (AV), and acute heart failure. Inhibition of smooth muscle anterior β2 receptors can lead to extreme cold and intermittent pain exacerbated Reynaud's phenomenon due to decreased peripheral blood flow [21]. In the present study found no adverse events occurred in patients who were treated.

Getting the number of patients antiplatelet drug therapy
Patients treated with the diagnosis of cardiovascular disease in general get antiplatelet drug therapy. In the present study found that almost all patients received antiplatelet drugs. The percentage of patients receiving antiplatelet drugs are aspirin 35 patients (87.5%) and 35 clopidogrel patients (87.5%), only one person ticlodipin patients (2.5%).

Judging from the patient's diagnosis, it was found that the diagnosis is most acute coronary syndromes. Acute coronary syndrome is caused by plaque rupture and thrombosis, antiplatelet and antithrombotic therapy that is very important to change the disease process and its development becomes worse. The use of combination antiplatelet, anticoagulant, and glycoprotein (GP) IIB / IIIA inhibitor is recommended. Antiplatelet drugs such as aspirin (ASA), which inhibits cycloxygenase-1 in platelets and prevents the formation of thromboxane A2 to reduce platelet aggregation recommended in this case [5].

Initial dose of aspirin (ASA) used was 160 mg, which is based on the trial of this dose found effectiveness in patients in order to survive. Subsequent doses of ASA 75-325 mg daily then it should be prescribed indefinitely unless contraindicated [23]. In this study, found that patients receiving aspirin therapy at a dose of 150 mg, this is because patients are getting treatment early in the ER, namely aspirin 160 mg. Cardiology ward where treatment is that maintenance therapy with doses of 100 mg aspirin and 150 mg. So it can be said that the doses received by patients is in accordance with existing guidelines.

Unwanted effects from the use of aspirin is, active bleeding, uncontrolled hypertension or peptic ulcer. So its use must be considered in patients who have conditions such as above and also patients who are

allergic to aspirin. In the present study found no side effects in 22 patients.

Thienopyridines or adenosine receptor antagonists dephosphate (ADP) such as clopidogrel (plavix) and ticlopidine (Ticlid) works by inhibiting platelet aggregation. Clopidogrel inhibit the binding of ADP to platelet receptors selectively complex and activation of receptor-mediated GP-Iib/IIIa by ADP, where the prevention of adhesion of blood plate. Clopidogrel should be given in a hospital emergency room (ER) if the patient has an allergy to aspirin. There is strong evidence to support the concurrent use of clopidogrel with aspirin in acute coronary syndrome cases, the UA / NSTEMI [23]. In the present study found that patients using aspirin and clopidogrel simultaneously.

Provided with a loading dose of clopidogrel 300 mg and then 75 mg orally every day. In the present study found that patients get the therapy at a dose of 75 mg clopidogrel. This dose has been established in accordance with guideline [23].

Getting the number of patients drug therapy antithrombolytic
Antithrombotic therapy is designed to stop the annoying process of platelet aggregation and coagulation. Fondaparinux is a selective inhibitor for factor Xa, this drug binds to antithrombin accelerating activity. At therapeutic plasma concentrations, these drugs have no direct effect on the activity of thrombin. These drugs are proven to prevent venous thromboembolism (TEV) in patients undergoing surgery [14]. Dose of fondaparinux is 2.5 mg subcutaneously once daily. Fondaparinux also demonstrated for TVD and PE treatment, the doses used for this indication is 7.5 mg subcutaneously once daily. In this study patients received therapy at a dose of fondaparinux 2.5 mg subcutaneously. So it can be said that the patient receives the right dose [13].

Getting the number of patients that antihypertensive drug therapy Drugs Used by Group
Patients treated with the diagnosis of cardiovascular disease, normal antihypertensive drug therapy. In the present study found that patients get the antihypertensive drugs with diuretics, ACE inhibitors, Calcium Channel Blockers and. The percentage of patients receiving antihypertensive drugs is diuretics furosemide 26 patients (65%), hydrochorticosteriods 9 patients (22.5%). For the class of the ACE inhibitor ramipril 13 patients (32.5%), enalapril 1 patients (2.5%). Calcium Channel Blockers for the class of felodipine 7 patients (17.5%), and amlodipine 5 patients (12.5%).

Class of antihypertensive drug therapy Diuretics Used in Patients
Antihypertensive drug thiazide diuretics and the snare loop diuretics (furosemide) is a group selected for treating hypertension. Diuretics lower blood pressure by causing diuresis, a reduction in plasma volume associated with diuresis in a decrease in cardiac output (cardiac output, CO)

and blood pressure in the end. The main decrease in cardiac output leads to increased peripheral resistance. The decrease in peripheral vascular resistance is responsible for long-term hypotensive effect. Thiazid lowers blood pressure by mobilizing the sodium and water from the wall arterior a role in peripheral vascular resistance decreased [24].

Diuretics (furosemide) are the type most commonly used diuretics in heart failure therapy. Said snare loop diuretics in this type of activity that indicates the location of the region increases at the snare loop. This diuretic which induces an increase in blood flow mediated by the natriuretic effect of prostaglandins which produce [24].

Side effects of thiazide are hypokalemia, hypercalcemia, hyperuricemia, and sexual dysfunction. Whereas furosemide had less side effects, namely hypokalemia. Hypokalemia can cause muscle weakness or convulsions[24]. In the present study did not reveal any side effects in patients.

Class of antihypertension drug therapy of ACE Inhibitors Used in Patients
ACE inhibitor ramipril and enalapril are working to prevent changes angiostensin I became Angiostensi II (vasoconstrictor stimulus potential and aldosterone secretion). ACE inhibitors also prevent the degradation of bradykinin and other vasodilator compounds menstimulasisintesis including prostaglandin E2 and prostacyclin. In fact ACE inhibitors reduce blood pressure in patients with normal plasma renin activity, bradykinin, and the production of tissue ACE is important in hypertension [18]

Initial dose of low-dose ACE inhibitor should then be increased slowly. The recommended dosage for ramipril is 2.5 to 20 mg per day, while the dose of enalapril 5 mg daily for initial therapy and 10-40 mg per day for maintenance therapy 13. In the present study found that patients getting 2.5 mg doses of the drug ramipril and enalapril 5 mg sedangakn to 5 mg. can be said that the patient is getting appropriate medication dosage guidelines set Serious side effects that may result from the use of ACE inhibitors is neutropenia, and agranulocyte, proteinuria, glomerulonephritis, and acute renal failure. However, the patient's side effects are not found [18].

Antihypertensive drug therapy Calcium Channel Blockers Type Used in Patients
Calcium channel blockers are felodipine and amlodipine works by blocking calcium channels, thereby reducing the influx of extracellular calcium into the cell as a result makes the heart and smooth muscle relaxation. Relaxation of vascular smooth

muscle causing vasodilation and blood pressure associated with a reduction [21].

The recommended dose for Calcium Channel Blockers class denagn Amlodipine dose is 5-10 mg per day while felodipine 2.5 to 20 mg once a day [13]. In the present study found that patients get the therapy felodipine 5 mg and 15 mg once daily, whereas for amlodipine 5 mg once daily. Can be said that the patient had a therapeutic dose in accordance with existing guidelines.

Getting the number of patients drug therapy Antihyperlipidemia
Patients treated with the diagnosis of cardiovascular disease in general get antihyperlipidemia drug therapy. In this study it was found that virtually all patients get the drugs known as statins, namely atorvastatin antihyperlipidemia. The percentage of patients who received atorvastatin was 35 patients (87.5%).

Cholesterol, triglycerides, and phospholipids carried in the blood as a complex of lipids and proteins, known lipoprotein. Increased total and LDL cholesterol and decrease HDL cholesterol associated with the development of coronary heart disease. Antihyperlipidemia statin drugs inhibit 3-hydroxy-3-metilglutarit coenzyme A (HMG-CoA) reductase, interfering with conversion of HMG-CoA reductase to mevalonate, which is an important step in the biosynthesis of cholesterol [18]. Therapeutic dose of atorvastatin 40 mg a day is defined as the standard cardiovascular therapy [5]. In the present study found patients getting therapy with atorvastatin 40 mg once a day. It could be argued that the appropriate dose patients had an existing guideline.

Side effects of statins may include mild abdominal complaints, skin rashes, itchy stimuli, headache, fatigue, and sleep. However, in patients with no side affects were 18. Based on the above explanation drugs received by patient basically has to follow the standards (guidelines) which is in accordance with the AHA (American Heart Association), WHO (World Health Organization) and NICE (National Institute of Clinical Excellence) clinical guideline. Evaluation of priority use of the drug in a rational assessment of drug use. Evaluation of drug usage by comparing the use of drugs in hospitals with established standards or guidelines.

Assessment Drug Therapy and Patient Response to Cardiovascular Drugs
In the assessment of Drug Related Problems (DRPs) based on the accuracy of patient drug use indications, patient, drug, dose, time of administration, route of administration, interval of administration, duration of, and side effects did not reveal any DRPs, this suggests that the use of drugs in disease therapy Cardiovascular Hospital HUSM, Malaysia is in conformity with the standard therapy, in other words is the rational use of drugs and showed a good response to the patient with the known symptoms of loss felt by the patient

at admission Hospitals such as chest pain, palpitations, shortness of breath, sweating , vomiting.

Statistically, using Chi-Square analysis of the obtained P = 0.019, this shows that the symptoms experienced by patients having a significant association with cardiovascular disease. Of statistical data between the presence and absence of symptoms are felt by the sixth day of patient care, using Chi-Square analysis of the obtained P = 0.007. This indicated that the symptoms experienced by patients having a significant relationship with the sixth day of patient care. This means that on the sixth day of treatment all patients experienced symptoms disappear. So it can be said that the therapy in cardiovascular patients to give good results.

Description of Clinical Outcome Patients
For the rehabilitation and planning of patients discharge from hospital, the patient will be informed about the disease and management of cardiovascular risk factors and drug therapy for secondary prevention, lifestyle changes and are advised to take medication and follow-up care or control[25].

Based on the results obtained, it can be said that the treatment of cardiovascular disease at the HUSM been effective and patients showed a good response and good clinical outcomes for all patients, which can be seen from the data that none of the patients died. The outcome of this study found the percentage of patients that return home uncomplicated male patients were 5 men (12.5%) and female patients as many as 4 people (10%). While home with complications for 20 male patients (50%) and 11 were female patients (27.5%).

Statistically, using Chi-Square analysis obtained P value = 0.000. This indicated the clinical outcome patients had a significant association with cardiovascular disease. Means that the outcome is strongly influenced by patient drug response and therapy of cardiovascular disease.

Conclusion Therapy cardiovascular disease in HUSM have been effective, patients showed a good response and good clinical outcome for all patients.

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests