Systematic Review: Evaluation of Treatment in Cardiac Patients

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Keywords: Heart Disease, Heart Medicine.

Abstract: Coronary heart disease is a form of cardiovascular disease, the number one cause of death in the world and a degenerative disease linked to people's socio-economic lifestyle. It is caused by the narrowing of the coronary arteries, usually referred to as atherosclerosis. The aim of this research was to evaluate treatments for heart disease. The research method used was a PRISMA (Preferred Reporting Items for Systematic Review) level systematic review, which was done by searching for published articles about the use of drugs for heart disease. The literature search was conducted from June to September 2023 using Google Scholar, the National Library of Medicine and Public Health Review. The most commonly used treatments for heart disease are antiplatelets (clopidogrel, aspirin), anticoagulants (enoxaparin, warfarin, fondaparinux, UFH), and beta-blockers (propranolol, bisoprolol, carvedilol), ARBs (candesartan, telmisartan and irbesartan), statins (atorvastatin), nitrates (ISDN and nitroglycerin), CCBs (amlodipine) and diuretics (furosemide, spironolactone) and the least used is Ace-i (captopril, imidapril and ramipril). Conclusions from a review of the literature on the treatment of heart disease are important to ensure appropriate and effective treatment.

1 INTRODUCTION

Heart and blood vessel disease (cardiovascular disease) is a major health problem in developed and developing countries. Heart disease occurs when the cardiac output is insufficient to provide the body with the oxygen it needs (Elly, Bayu and Nurdiana, 2019).

Cardiovascular disease (CVD) remains a global threat and is the leading cause of death worldwide. According to the World Health Organization (WHO), more than 17 million people worldwide die from heart and blood vessel diseases.

The medicines that are commonly used to treat the heart depend on the type of heart disease. Several classes of drugs that are commonly used to treat heart disease include Antiplatelets, Anticoagulants, Betablockers, ARBs, Statins, Nitrates, CCBs and Diuretics.

Based on 2018 Basic Health Research (Riskesdas) data, the incidence of 52 heart and blood vessel diseases is increasing year by year. At least 15 out of every 1000 people, or about 2,784,064 people in Indonesia, suffer from heart disease (Ministry of Health, 2019).

The treatment of heart disease is not only about reducing or eliminating symptoms, but most importantly about preserving heart function to prolong life. In addition to heart disease, patients also have co-morbidities that require different types of drugs in the therapy given. Therefore, the choice of the type of drug will largely determine the quality of drug use in the selection of therapy.

2 RESEARCH METHODS

The research method used is a systematic review, which searches for published articles related to the use of cardiac medications. The search strategy used to obtain research articles used online database facilities via the Google Scholar site, the National Library of Medicine and Public Health Reviews using the keywords "heart disease, heart medicine", with the search years limited to 2017 to 2023. The author used systematic review methods according to the PRISMA (Preferred Reporting Items for Systematic Review) stages, which include identification, filtering, inclusion and eligibility of articles for further analysis.

To record treatment, articles that met the inclusion criteria were reviewed. Each risk factor found in the published research report is recorded and presented with a narrative explanation. Conclusions are drawn based on treatment and drug data related to the use of

cardiac medications. The literature search yielded 1670 articles from Public Health Reviews, National Library of Medicine and Google Scholar data, there were several that did not meet the inclusion criteria, 40 articles were excluded. There are still 20 articles with full manuscripts.
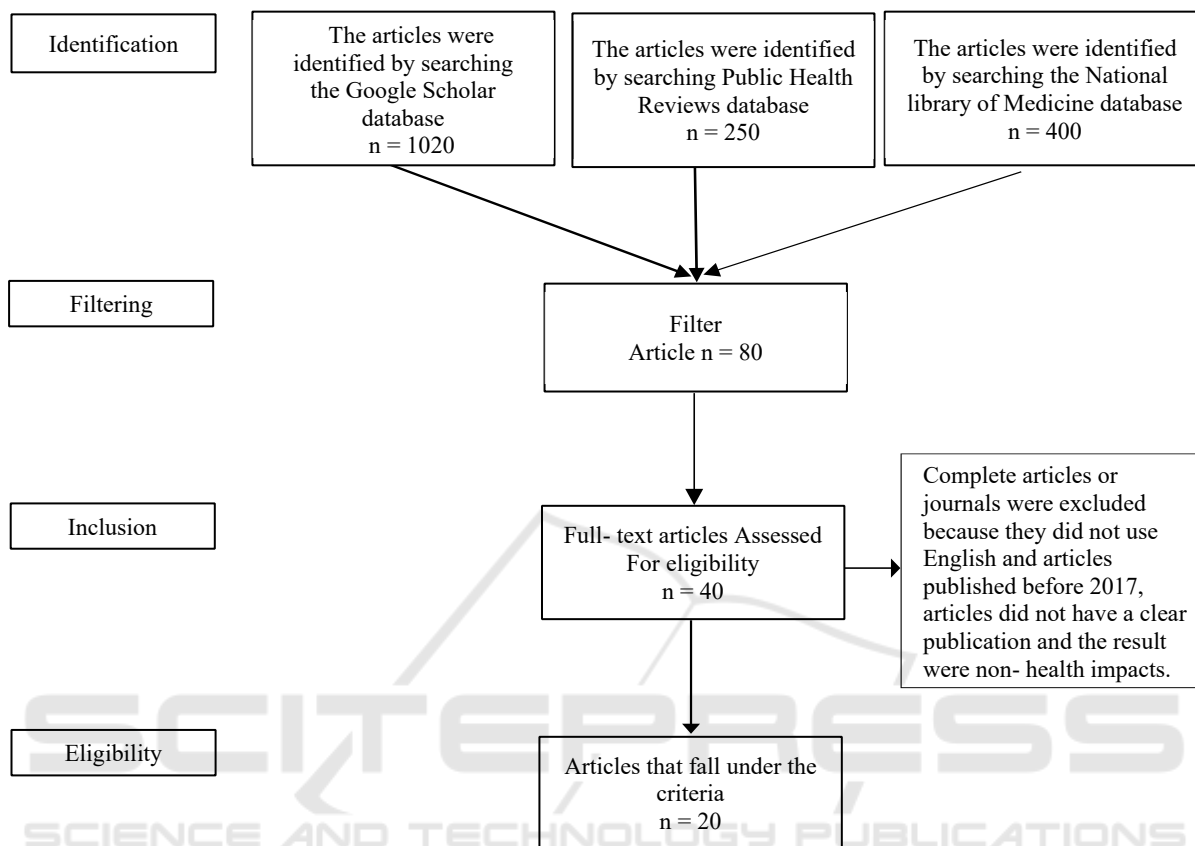

Figure 1: Article collection using the PRISMA method.

3 RESULTS PERVIOUS RESEARCH

Table 1: Pervious research.

No.	Author	Title	Conclusion
1	Yuni Andriani, Robiyanto, Nurmainah (2017)	Profile of Patients Using Inpatient Coronary Heart Medicine at Sultan Syarif Mohammad Alkadrie Regional Hospital Pontianak, 2017	The types of drugs used in CHD patients were nitrates in 37 patients, antiplatelets in 34 patients, anticoagulants in 30 patients, statins in 23 patients, and β-blockers in 15 patients.
2	Tri Wulandari, Nurmainah, Robiyanto, (2017)	Description of Drug Use in Inpatient Congestive Heart Failure Patients at Sultan Syarif Mohamad Alkadrie Hospital Pontianak, 2017	that the most frequently used drugs were diuretic drugs 62.50%, ARB 23.75%, ACE inhibitors 7.50%, and beta blockers 6.25%.
3	Dwi Ulfa Rahmawati, Nurul Mutmainah (2018)	Study of Potential Drug Interactions in Inpatient Coronary Heart Disease Patients at Moewardi Regional Hospital, 2018	Management of coronary heart disease requires several medications such as (beta blockers, nitrates, CCBs, ARBs, ACE-Inhibitors); anti- platelets (Aspirin, Ticagrelor, Clopidogrel); anti- coagulants (Enoxaparin, Warfarin, Fondaparinux, UFH) and statin drugs as lipid controllers.

Table 1: Pervious research (cont.).

No.	Author	Title	Conclusion
4	Anisa, Widya Fikma, (2019)	Evaluation of Medication Use in Congestive Heart Failure Patients at the Cardiac Clinic of RSUP DR. M. Djamil Padang.	The results of research on the use of the most widely used drugs are Bisoprolol (26.1%), Furosemide (25.5%), and Spironolactone (20.9%).
5	Indah Setyaningsi, Rinto Susilo, Khofifah, (vol.1 No. 2, January 2019)	Description of Potential Drug Interactions in Prescriptions for Cardiovascular Patients at the Internal Medicine Clinic at Gunung Jati Regional Hospital, Cirebon 2018	The research results show that the most frequently prescribed cardiovascular drug is amlodipine, namely 63 sheets, the least is ACEI inhibitor drugs such as captopril, imidapril and ramipril, each of which only has 1 sheet.
6	Tatang Tajudin, Velya Faradiba, Ikhwan Dwi Wahyu Nugroho, (2019)	Combination Analysis of Drug Use in Coronary Heart Disease Patients with Concomitant Diseases at X Hospital Cilacap, 2019	Cardiovascular system drugs that are often given for coronary heart cases are CCB (Amlodipine), antiplatelet (Aspirin, Clopidogrel), Beta blockers (Bisoprolol, ARB (Irbesartan, Candesartan), Statins (simvastatin, Atorvastatin) and at least ACE-i (Captopril, Ramipril)
7	Wirtanto, Ardy Putra, (2019)	Application of the European Society of Cardiology Suspension Failure Management Guidelines for Heart Failure Patients for the Period January 2015 – December 2018 at RSUP. Adam Malik Medan.	Recommended drug use based on indications is ACE-i/ARB (89.1%), beta-blockers (83.4%), and diuretics (93.7%)
8	Fitriadi. Ab, Muh. Shawwal (2020)	Profile of Cardiovascular Drug Use in Makassar Inpatient Health Centers for the Period January 2019 - June 2019	There were 5 types of medication given to each patient with different doses, it was found that Clopidogrel, Simvastatin, Bisoprolol, Valsartan, Aspilet, Candesartan, and Nitrokaf.
9	Ria Selrina, Endang Susilowati, (2020)	Coronary Heart Disease Prescribing Patterns at the Outpatient Clinic of Hermina Tangkuban Prahu Hospital, Malang, February 2020.	The results of the study showed that the drug classes used in CHD therapy were antiplatelet 37.5% (Clopidogrel, acetosal, cilostazol, tricagelor), Statin 29.8% (simvastatin, atorvastatin, rovastatin), nitrate 20.5% (ISDN, and Nitroglycerin), beta blockers 4.7% (Propranolol, Bisoprolol and carvedilol), ARB 4.2% (Candesartan, telmisartan and irbesartan), ACE-I 0.7% (Imidapril and perindopril) and CCB 0.5% (Amlodipine).
10	Rini Dwi Lestari, Rasmala Dewi, Mukhlis Sanuddin, (2020)	Evaluation of Medication Use in Coronary Heart Disease Patients in the Inpatient Installation of Raden Mattaher Regional Hospital Jambi,2020	The results of the research show that the type of drug most widely used for coronary heart patients is the antiplatelet group (100%), beta blockers(100%, statins (100 %), nitrate (95.2 %), ACE inhibitors (11.9 %).
11	Risma Siagian, (2020)	Description of Drug Prescribing Profile in Outpatient Heart Disease Patients at Rs. Bhayangkara Medan, 2020	The results of the study showed that the highest types of drugs used by heart disease sufferers were Bisoprolol at 40%, Valsartan at 28%, Isosorbide Dinitrate and Nitroglycerin at 3%, Warfarin, digoxin and Amlodipine at 3%, and Candesartan at 1%.
11	Risma Siagian, (2020)	Description of Drug Prescribing Profile in Outpatient Heart Disease Patients at Rs. Bhayangkara Medan, 2020	The results of the study showed that the highest types of drugs used by heart disease sufferers were Bisoprolol at 40%, Valsartan at 28%, Isosorbide Dinitrate and Nitroglycerin at 3%, Warfarin, digoxin and Amlodipine at 3%, and Candesartan at 1%.
12	Ayu Wulandari, (2021).	Profile of Medication Use in Coronary Heart Patients Inpatients at Wirabuana General Hospital, Palu	Based on research results from an analysis of the rationality of therapy for the use of the most widely used coronary heart drug, namely amlodipine, at 25%.
13	Nur Hasanah, Fadly Putajaya, Lela Kania, Nur Wulan Adi Ismaya, Nanda Nurul Aini, (2021)	Description of Heart Disease Based on Demographics and Medication Use in Patients with Heart Disease at Home Hospital X in the city of South Tangerang for the period 2015 to 2019	The research results show that the drugs that doctors often prescribe are antiplatelets (Clopidogrel) and Betablockers (Bisoprolol).

Table 1: Pervious research (cont.).

No.	Author	Title	Conclusion
14	Safitri, Puput Novita (2021)	Heart Disease Drug Prescription Profile at the Gama Sidoardjo Pharmacy December 2020 – January 2021.	The most common types of drugs used by heart disease sufferers are Spironolactone, Furosemide and Candesartan.
15	Anisa Dwi Syafitri, (2022).	Identification of Potential Drug Interactions in Prescribing Coronary Heart Patients in the Outpatient Installation of Airlangga University Hospital, Surabaya, 2022.	The results of the study showed that the types of drugs used were 316 antiplatelets and 288 beta blockers.
16	Rakhmawati, Dian (2022)	Profile of heart medication prescribing in outpatient services at Hospital X Surabaya for the period June-August 2021.	The research results show that the most widely prescribed drug classes are: Statin group (20.21%), Antiplatelet group (16.53%), Ca Antagonist group (12.25%), Angiotensin II Receptor Antagonist group (10.94%) and Betablocker group (10.70%).
17	Muhammad Tahir,(2022)	Profile of Heart Medication Use in Outpatients at Stella Maris Hospital Makasar	The research results show amlodipine drug 32.7%, Bisoprolol 25.8%, Candesartan 21.9%, Furosemide 13.3%, Simvastatin 6.87%, and Nifedipine 1.25% and the least used drug is Captopril 0.13%.
18	Moiwend, Richa Feronika, (2022)	Overview of the Use of Heart Medicine in Heart Disease Patients in the Out patient Installation of Santa Maria General Hospital, Pemalang, 2022	The results of the study showed that the most common drug use was bisoprolol. The drug group that is often used to reduce and prevent myocardial ischemia is the antiplatelet group (aspirin, clopidorel), nitrates (Nitroglycerin), beta-blockers (Bisoprolol), statins (atorvastatin).
19	Meidy, Arsa Nur (2022)	Profile of Prescribing Heart Disease Medicines in Outpatient Care at Wiyung Sejahtera Hospital, Surabaya, 2021	The most common use of heart drug therapy is beta blockers (Bisoprolol), Spironolactone (Diuretic), Simvastatin (statin) and ARB (Candesartan.)
20	Wan Syurya Tri Dharma, (2023)	Evaluating Drug Use For Coronary Heart Disease Patients After Stent Insertion at RSPAD Gatot Soebroto,2023	The results of the study showed that the type of drug used was a combination of aspirin and clopidogrel in 70 patients (83.34%).

4 DISCUSSION

The following are used to treat:

1. Antiplatelets (Clopidogrel, Aspirin), The mechanism of action of Clopidogrel and Aspirin is to prevent blood clots from forming in the blood vessels because it can cause narrowing of blood flow in the blood vessels, which can cause the death of cells in the heart. (Nur Hasanah, Fadly Putajaya, Lela Kania, Nur Wulan Adi Ismaya, Nanda Nurul Aini, 2021).
2. Anticoagulants (Enoxaparin, Warfarin, Fondaparinux, UFH), The mechanism of action of anticoagulants works by preventing the formation of networks between platelet cells. (Dr Aditya Angela Adam, M. Biomed, 2022).
3. Betablockers (propranolol, bisoprolol, carvedilol), the mechanism of action is different from that of antihypertensive or antihypertensive drugs and are used for secondary prevention. (Nur Hasanah, Fadly Putajaya, Lela Kania, Nur Wulan Adi Ismaya, Nanda Nurul Aini, 2021).
4. ARBs (candesartan, telmisartan and irbesartan), The mechanism is angiotensin II receptor antagonist. Their properties are similar to ACE inhibitors, but this class of drugs does not inhibit the breakdown of bradykinin and other kinins, so it does not cause the persistent dry cough that usually interferes with therapy with ACE inhibitors. (Ria Selrina, Endang Susilowati, 2020).
5. Statins (atorvastatin), Treatment with statins reduces the risk of primary or secondary prevention. Atorvastatin as primary prevention of

CHD in post-hypertension. In addition to lowering cholesterol, statins have other mechanisms (pleiotropic effects) that may play a role, including anti-inflammatory and anti-thrombotic effects. (Ria Selrina, Endang Susilowati, 2020).

6. Nitrates (ISDN and nitroglycerine), are nitrates that have a vasodilator effect. This medicine works by dilating blood vessels and increasing blood flow.

7. CCB (Amlodipine), Amlodipine works by relaxing the walls of blood vessels, the effect of which is to facilitate blood flow to the heart and reduce heart pressure, in addition to reducing symptoms of chest pain or angina pectoris in coronary heart disease. (Ria Selrina, Endang Susilowati, 2020).

8. Diuretics (furosemide, spironolactone), The mechanism works by helping the kidneys to release more salt and water from the blood vessels into the urine.

9. Ace-i (Captopril, Imidapril and Ramipril),The mechanisms can inhibit bradykinin degradation and stimulate the synthesis of substances that can cause vasodilation, increasing bradykinin increases the blood pressure lowering effect of ACE inhibitors.

5 CONCLUSION

Based on the results of a systematic review, the most commonly used treatments in patients with heart disease are antiplatelets (clopidogrel, aspirin), anticoagulants (enoxaparin, warfarin, fondaparinux, UFH), betablockers (propranolol, bisoprolol, carvedilol), carvedilol), ARBs (candesartan, telmisartan and irbesartan), statins (atorvastatin), nitrates (ISDN and nitroglycerin), CCBs (amlodipine) and diuretics (furosemide, spironolactone) and the least used is Ace-i (captopril, imidapril and ramipril).

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