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THE RELATIONSHIP OF *HYPERTENSIVE HEART DISEASE* (HHD) TO THE INCIDENCE OF CORONARY HEART DISEASE IN 2023 AT IBNU SINA HOSPITAL, MAKASSAR CITY

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Abstract

Background: *Hypertensive heart disease* (HHD) is a long-term consequence of chronic high blood pressure. Persistent high blood pressure is a major risk factor for the development of heart diseases such as atherosclerotic disease, heart failure, atrial fibrillation, and coronary heart disease. Objective: To determine the relationship of Hypertensive Heart Disease (HHD) to the incidence of Coronary Heart Disease (CHD) in 2023 at Ibnu Sina Hospital Makassar City. Methods: Analytic observational research with cross sectional method. Results: HHD patients who suffered from CHD were 29 people (38.7%), while HHD patients who did not suffer from CHD were 46 people (61.3%) p value of 0.735 with *chi-square* test. Conclusion: There is no significant relationship between *Hypertensive Heart Disease* (HHD) and the incidence of Coronary Heart Disease.

Keywords: Hypertensive Heart Disease (HHD), Coronary Heart Disease (CHD), Ibn Sina Hospital Makassar City

Introduction

Cardiovascular disease remains a major problem worldwide with high morbidity and mortality rates. According to the *World Health Organization* (WHO), 17.9 million people died from cardiovascular disease in 2019. Cardiovascular diseases include coronary heart disease, cerebrovascular disease, hypertension, peripheral arterial disease, congenital heart disease and heart failure. It is estimated that around 7.4 million people die from Coronary Heart Disease (CHD). Basic Health Research (Riskesdas) data shows the prevalence of cardiovascular diseases such as hypertension increased from 25.8% (2013) to 34.1% (2018), Coronary Heart Disease (CHD) remained at 1.5% (2013-2018) where the highest incidence (3.6%) was in the age group of 65-74 years and followed by the age group above 75 years at 3.2%.[1,2]

Hypertensive Heart Disease (HHD) is a chronic progressive disease that develops over many years. HHD is the long-term result of chronic high blood pressure. According to WHO in 2023, if blood pressure is measured on two different days, and the systolic blood pressure reading on the second day is >140 mmHg and the diastolic pressure is >90 mmHg will be diagnosed as hypertension.[3,4] HHD is a chronic progressive disease that significantly increases the risk of cardiovascular death. Persistent high blood pressure is a major risk factor for the development of heart

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diseases such as atherosclerotic disease, heart failure, valvular disease, atrial fibrillation, and coronary heart disease.[3]

Coronary Heart Disease (CHD) is a condition that occurs when the arteries that supply blood to the heart muscle harden and narrow, spasm or a combination of both, making the heart unable to get the blood and oxygen it needs which can consequently disrupt heart function. Risk factors for Coronary Heart Disease are generally influenced by smoking, high blood pressure or hypertension, and lack of physical activity.[2,5] According to research conducted by *Tsai* et al (2017), hypertension is one of the important cardiovascular risk factors that increase the incidence of coronary heart disease. Another study conducted by Sari (2017) showed that high blood pressure has a significant impact on the incidence of CHD, because an increase in heart workload increases the risk of heart damage.[5,6]

Based on the background description above, the researcher is interested in conducting research on how the relationship between HHD and the incidence of coronary heart disease in 2023, especially at Ibnu Sina Hospital Makassar City.

Methods

This research is a *cross sectional* study with an observational analytic method that uses an analytic descriptive approach. The research location was at Ibnu Sina Hospital Makassar City which was carried out in July 2024. The population of this study were *Hypertensive Heart Disease* (HHD) patients recorded at Ibnu Sina Hospital Makassar City for the period 2023. The research sample was taken using *total sampling* technique with a total sample that met the inclusion criteria, so that the total sample obtained was 75 people. Data were collected from secondary data in the form of treatment records obtained from the medical records of patients recorded as HHD patients in the Inpatient Installation for the period 2023. The collected data will be analyzed using *Microsoft Excel* and SPSS programs.

Results

This study uses univariate and bivariate analysis to examine the incidence of *Hypertensive Heart Disease* (HHD), the relationship between *Hypertensive Heart Disease* (HHD) to the incidence of CHD, and the most commonly used medical therapy by *Hypertensive Heart Disease* (HHD) patients at Ibnu Sina Hospital Makassar City in 2023. With a total of 125 patients recorded suffering from HHD in the Inpatient Installation but who met the inclusion criteria of 75 people.

Univariate Analysis Results

Characteristics Based on HHD Medication Management

Table 1. Antihypertensive drugs used by HHD patients in the Inpatient Installation of Ibnu Sina Hospital Makassar City

Type of Therapy	Goals	Generic Name	Total	Percentage
1 type of medicine	CCB	Amlodipine	19	25%
		Nicardipine	1	1%
	Diuretics	Furosemide	7	9%
	ACE-Inhibitors	Captopril	3	4%
	ARB	Candesartan	2	3%
	Beta Blockers	Bisoprolol	2	3%
2 types of medicine	Diuretics	Furosemide	9	12%
	ACE-Inhibitors	Captopril		

Type of Therapy	Goals	Generic Name	Total	Percentage
		Furosemide Ramipril	1	1%
	Diuretics *Beta Blockers*	Furosemide Bisoprolol	9	12%
	Beta Blockers ACE-Inhibitors	Bisoprolol Captopril	1	1%
		Bisoprolol Lisinopril	1	1%
	Beta Blockers ARB	Bisoprolol Candesartan	2	3%
	CCB ACE-Inhibitors	Amlodipine Ramipril	2	3%
	CCB Diuretics	Amlodipine Furosemide	1	1%
	ARB Diuretics	Candesartan Furosemide	1	1%
	Beta Blockers CCB	Bisoprolol Amlodipine	1	1%
	CCB ARB	Amlodipine Candesartan	2	3%
3 Types of Medicine	Diuretics *Beta Blockers* CCB	Furosemide Bisoprolol Amlodipine	4	5%
	Diuretics ACE-Inhibitors	Furosemide Captopril	2	3%
	Beta Blockers Diuretics CCB	Bisoprolol Furosemide Amlodipine	2	3%
	ARB Diuretics ACE-Inhibitors	Candesartan Furosemide Captopril	1	1%
	CCB Diuretics ARB	Amlodipine Furosemide Candesartan	1	1%
	Beta Blockers CCB ARB	Bisoprolol Amlodipine Irbesartan	1	1%
	Beta Blockers	Bisoprolol		
Total			**75**	**100%**

(Source: Secondary Data, 2024)

From the results of the research conducted, medical therapy (antihypertension) of HHD patients in the Inpatient Installation at Ibn Sina Hospital in 2023 was divided into 3 namely, patients who had received 1 type of drug, 2 types of drugs, and 3 types of drugs. Patients who received 1 type of drug therapy during hospitalization were 34 patients. The most commonly used drug is the *Calcium Channel Blocker* (CCB) group, namely amlodipine as much as 25%, and Nicardipine as much as 1%. Furthermore, the diuretic group is furosemide as much as 9%. Followed by the ACE-Inhibitor group, namely Captopril as much as 4%. And then followed by the *Angiotensin Receptor Blocker* (ARB) group, namely candesartan and *Beta Blocker* (Bisoprolol) by 3%.

Patients who had received 3 types of drugs while being treated at the Inpatient Installation were 11 patients. The most are diuretics, and beta blockers, CCBs namely Furosemide, Bisoprolol, and Amlodipine by 5%. Furthermore, diuretics, ACE-Inhibitors, and beta blockers, namely furosemide, captopril, and bisoprolol by 3%. Then also patients who have received diuretic, CCB, and ARB drugs,

namely furosemide, amlodipine, and candesartan by 3%. Furthermore, diuretics, ACE-Inhibitors, and CCBs, namely furosemide, captopril, amlodipine by 1%. Then followed by diuretics, ARBs, *beta blockers*, namely furosemide, candesartan, and bisoprolol by 1%. Furthermore, patients who have received CCB, ARB, and *beta blocker* drugs are amlodpine, irbesartan, and bisoprolol by 1%.

Distribution of Patients Based on CHD Events and Diagnosis of Hypertensive Heart Disease (HHD)

In this study, the operational definition of HHD is a patient diagnosed with HHD based on the criteria:

1. Anamnesis
2. Physical examination: TDS ≥140 mmHg & diastolic blood pressure ≥90 mmHg.
3. ECG overview
4. Thoracic X-Ray Examination

So that patients are assessed based on the fulfillment of these criteria, which are categorized by meeting 2 criteria, 3 criteria and 4 criteria. The following data illustrates the distribution of HHD patients with/not with Coronary Heart Disease and the diagnosis of HHD.

Table 2: Distribution of Patients Based on the Incidence of Coronary Heart Disease (CHD) and Diagnosis of Hypertensive Heart Disease (HHD)

Category	Subcategory	n	Percentage (%)
Incidence of CHD	Yes	29	38.7
	No	46	61.3
Total (CHD)		75	100
Diagnosis of HHD	Meets 2 Criteria	8	10.7
	Meets 3 Criteria	41	54.7
	Meets 4 Criteria	26	34.7
Total (HHD)		75	100

Source: Secondary Data, 2024

Based on table 2, it is known that HHD patients who suffer from CHD are 29 people with a percentage of 38.7%. Meanwhile, HHD patients who did not suffer from CHD were 46 people with a percentage of 61.3%. Patients diagnosed with HHD by meeting 2 criteria were 8 people with a percentage of 10.7%, who met 3 criteria were 41 people with a percentage of 54.7%, while those who met 4 criteria were 26 people with a percentage of 34.7%.

Bivariate Analysis Results

Relationship between HHD and the incidence of CHD

Bivariate analysis was conducted with the aim of seeing the relationship between HHD and the incidence of Coronary Heart Disease in the Inpatient Installation of Ibnu Sina Hospital Makassar City in 2023. This analysis uses the *chi square* test to see the effect of the two variables. The significance value in this study is 0.05. So that if the value of Asymp. Sig. (2-tailed) <0.05 (H1 is accepted), which means there is a relationship between the two variables studied. The test results are shown in the following table.

Table 3. The Relationship between HHD and the Incidence of CHD in the Inpatient Installation of Ibnu Sina Hospital Makassar City Year 2023

HHD	CHD				Total		*p-value*
	No		Yes				
	n	%	n	%	n	%	
Meets 2 Criteria	4	50.0	4	50	8	100	
Meets 3 Criteria	25	61.0	16	39.0	41	100	0.735
Meets 4 Criteria	17	65.4	9	34.6	26	100	
Total	**46**	**61.3**	**29**	**38.7**	**75**	**100**	

(Source: SPSS22 Output, 2024)

Based on table 3, bivariate analysis using the *chi square* test to see how the relationship between HHD and the incidence of Coronary Heart Disease in the Inpatient Installation of Ibnu Sina Hospital Makassar City in 2023 shows results with a p value of 0.735 where these results statistically indicate that there is no significant relationship (p>0.05). Therefore, it can be concluded that there is no significant relationship between HHD and the incidence of CHD in the Inpatient Installation of Ibnu Sina Hospital Makassar City.

Discussion

Hypertensive Heart Disease (HHD) refers to heart problems caused by long-term high blood pressure. When the heart pumps against this pressure, it has to work harder. Over time, this causes the heart muscle to thicken. High blood pressure also leads to thickening of the blood vessel walls and the formation of atherosclerosis.[7]

Based on the results of secondary data processing carried out on HHD patients at the Ibn Sina Hospital Inpatient Installation in 2023, it was found that there was no significant relationship between HHD and CHD incidence. The results are in accordance with research conducted by Qothi (2021) at the Integrated Heart Service Center of Dr. Soetomo Surabaya Hospital, this study argues that dyslipidemia is the most influential factor on the incidence of CHD with a percentage of 77%. And research conducted by Hakim (2020) also shows that there is no relationship between hypertension and CHD (p value = 0.191).[8,9]

However, in another study from Fika Minata (2019) stated that there was a statistically significant relationship between hypertension and coronary heart disease. Research conducted by Rachmawati (2020) also said that there is a significant relationship between hypertension and coronary heart disease.[10,11]

Based on the 2019 Hypertension Management Consensus, there are five main classes of antihypertensive drugs that are routinely recommended, namely: ACE-Inhibitors, ARBs, *Beta Blockers*, CCBs, and diuretics.[12] The five classes of drugs are in accordance with the types of drugs used in patients with HHD in the Inpatient Installation of Ibnu Sina Hospital Makassar City.

Based on the results of secondary data processing, the most widely used drug class for single therapy in HHD patients at the Ibnu Sina Hospital inpatient installation in 2023 was the *Calcium Channel Blocker* (CCB) group, namely amlodipine as much as 25% (19 patients). CCB is one type of antihypertensive drug that has a mechanism of action that blocks and prevents the entry of calcium into the walls of blood vessels which results in dilated blood vessels so that blood pressure decreases.

The findings of the researchers are in accordance with the results of research by Anggi et al (2021), where it is stated that the most widely used drug class for single therapy is the CCB group, namely amlodipine in patients at the Sleman Regency First Level Health Facility.[13] The results of

research conducted by Dicky Wahyudi (2018) also show that the CCB drug class is the most widely used in hospitalized patients at Arang Boyolali Hospital.[14]

In addition to the use of single therapies such as CCBs that have been discussed previously, this study also found the use of two-drug combination therapy for HHD patients. The use of combination therapy is aimed at improving the effectiveness of blood pressure control in patients with more complex hypertensive conditions or in those with comorbidities such as coronary heart disease.

One of the widely used combinations is the diuretic and ACE-Inhibitor group, with the generic names furosemide and captopril. This combination was used by 9 patients at the Ibn Sina Hospital Inpatient Installation in 2023. Furosemide works by increasing the excretion of sodium and water through the kidneys, by increasing the excretion of sodium and water through the kidneys, thus reducing the volume of fluid in the body and ultimately lowering blood pressure. Meanwhile, ACE-Inhibitors in this case captopril effectively lowers blood pressure through inhibition of the renin-angiotensin system. The use of this drug combination is in line with a study conducted by Claudio Borghi et al (2020), which revealed that ACE-Inhibitors and diuretics are typical first-line antihypertensive drugs with complementary mechanisms of action. The combination of ACE-Inhibitors and diuretics reduces major cardiovascular events in various hypertensive patients with or without comorbidities.[15]

In this study, it was found that the majority of HHD patients accompanied by CHD had received beta blocker therapy as many as 13 people, ARB as many as 5 people, CCB as many as 7 people. This is in accordance with the 2019 Hypertension Management Consensus hypertension patients suffering from CHD are recommended drugs with beta blockers, ARBs, and CCBs.

Based on the results of this study, it is known that there is no relationship between HHD and CHD. As for the treatment of HHD, the CCB antihypertensive drug class is the choice for the management of hypertension either used alone or in combination with other antihypertensive drugs.

Conclusion

Based on the results and discussion, it can be concluded that the number of patients suffering from *Hypertensive Heart Disease* (HHD) in the Inpatient Installation of Ibnu Sina Hospital Makassar City in 2023 was 125 people. And the results showed that there was no significant relationship between HHD and Coronary Heart Disease (CHD). HHD patients at the Ibn Sina Hospital Inpatient Installation in 2023 mostly only took one type of drug during the treatment process with the *Calcium Channel Blocker* (CCB) drug class, namely amlodipine which was most commonly used (19%). However, there were also some patients who took two types of drugs and three types of antihypertensive drugs during the treatment process.

Advice

Future studies are recommended to include a wider range of risk factor variables such as lifestyle, obesity, smoking history, family history, cholesterol levels, as well as using a longitudinal design to monitor patient progression in greater depth. In addition, multivariate analysis is needed to identify significant factors affecting HHD, and the scope of the study can be expanded to other locations to improve the generalizability of the results. Qualitative research can also be conducted to explore patients' perceptions and habits in managing hypertension and preventing HHD complications.

References

[1] Kementrian Kesehatan Republik Indonesia. Penyakit Jantung Koroner Didominasi Masyarakat Kota. *Kementeri Kesehat RI*. Published online 2021:1. https://www.kemkes.go.id/article/view/21093000002/penyakit-jantung-koroner-didominasi-masyarakat-kota.html%0Ahttps://www.depkes.go.id/article/view/19020100003/hari-kanker-sedunia-2019.html

[2] Sattari PG. *Hubungan Hipertensi Terhadap Kejadian Kardiovaskular Mayor Pada Pasien Infark Miokard Akut Yang Dirawat Di RSUD Raden Mattaher Provinsi Jambi Pada Tahun 2021*.; 2022. www.aging-us.com

[3] Moreno MU, González A, López B, et al. Hypertensive Heart Disease. *Encycl Cardiovasc Res Med*. 2023;1-4:517-526. doi:10.1016/B978-0-12-809657-4.10898-1

[4] World Health Organization (WHO). Hypertension. 2023;(March). https://www.who.int/news-room/fact-sheets/detail/hypertension

[5] Sari SRJ. *Faktor Risiko Penyakit Jantung Koroner Pada Pegawai Negeri Sipil UIN Alaudin Makasar Tahun 2017*.; 2017.

[6] Tsai IT, Wang CP, Lu YC, et al. The burden of major adverse cardiac events in patients with coronary artery disease. *BMC Cardiovasc Disord*. 2017;17(1). doi:10.1186/S12872-016-0436-7

[7] Penn Medicine. Hypertensive Heart Disease - Symptoms and Causes. Accessed November 20, 2024. https://www.pennmedicine.org/for-patients-and-visitors/patient-information/conditions-treated-a-to-z/hypertensive-heart-disease

[8] Qothi I, Fuadi MR, Subagjo A. Profile of Major Risk Factors in Acute Coronary Syndrome (ACS) at Pusat Pelayanan Jantung Terpadu (PPJT) Dr. Soetomo Public Hospital Surabaya Between the Period of January-December 2019. *Cardiovasc Cardiometabolic J*. 2021;2(2):59. doi:10.20473/ccj.v2i2.2021.59-72

[9] Marufi R, Rosita L. Hubungan Dislipidemia dan Kejadian Penyakit Jantung Koroner. *JHE (Journal Heal Educ*. 2014;6(1):47-53. doi:10.20885/jkki.vol6.iss1.art7

[10] Rachmawati C, Martini S, Artanti KD. Analisis Faktor Risiko Modifikasi Penyakit Jantung Koroner Di Rsu Haji Surabaya Tahun 2019. *Media Gizi Kesmas*. 2021;10(1):47. doi:10.20473/mgk.v10i1.2021.47-55

[11] Minata F. IM. Hubungan Antara Hipertensi dan Kadar Kolesterol Dengan Penyakit Jantung Koroner (PJK) di RSUD Besemah Pagar Alam. *J Kesehat Saelmakers Perdana*. 2019;2(2):214-219.

[12] Perhimpunan Dokter Hipertensi Indonesia. Konsensus Penatalaksanaan Hipertensi 2019. *Indones Soc Hipertens Indones*. Published online 2019:1-90.

[13] Diwati A, Sofyan O. Profil dan Rasionalitas Penggunaan Obat Antihipertensi Pada Pasien Hipertensi Di Fasilitas Kesehatan Tingkat Pertama Periode Mei - Juli 2021. 2023;19(1):1. doi:10.22146/farmaseutik.v19i1.80153

[14] Wahyudi D. Profil Penggunaan Obat Antihipertensi Pada Pasien Rawat Inap di RSUD Pandan Arang Boyolali Tahun 2018. Published online 2019.

[15] Borghi C, Soldati M, Bragagni A, Cicero AFG. Safety implications of combining ACE inhibitors with thiazides for the treatment of hypertensive patients. *Expert Opin Drug Saf*. 2020;19(12):1577-1583. doi:10.1080/14740338.2020.1836151