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THE USE OF ANTIHYPERTENSIONS IN HYPERTENSION PATIENTS AT X HOSPITAL IN JEMBER

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ABSTRACT

Background: Hypertension is the most common and common disease suffered by society. According to WHO (2023), hypertension is the third cause of death, because 1.28 billion people in the world suffer from hypertension. Hypertension sufferers at X Hospital Jember in 2022 are 4,774 patients. The increase in hypertension can be caused by risk factors, such as age, gender, obesity, lack of physical activity, smoking, stress, and consuming high levels of fat. The aim of the research is to determine the use of antihypertensive drugs in hypertensive patients at X Hospital Jember in 2023. **Methods:** This research is a non-experimental study with a retrospective descriptive research design. The data source in this research is the patient's electronic medical record data. Samples were taken using a total sampling technique which met the inclusion criteria as many as 44 patients. This research was conducted in the medical records room at X Hospital Jember with data for January-December 2022. Data is displayed in frequency and percentage form. Research results: During the research, it was found that almost half of the drug categories used a single drug with a percentage of 48%, and a small number of drug categories used a combination of three groups with a percentage of 11%. Based on drug class, almost half of them use ARB class drugs with a percentage of 27.3%. Based on drug type, almost half of the patients use candesartan drugs with a percentage of 27.3%. Based on the drug dose, a small percentage received a prescription for candesartan at a dose of 8 mg once a day with a percentage of 18.4%. **Conclusion:** Almost half of the use of antihypertensives in hypertensive patients at X Hospital in Jember is the ARB group, namely candesartan 8mg given once a day.

Key words: antihypertensive, hypertension, drug use.

INTRODUCTION

Hypertension is an increase in blood pressure with systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg in two measurements taken five minutes in a state of sufficient rest or calm (Ministry of Health of the Republic of Indonesia, 2017). Hypertension is one of the main factors causing death. Hypertension is the third cause of death after stroke and tuberculosis, reaching 6.7% (Natalia *et al*, 2014).

According to the World Health Organization (2023), there are an estimated 1.28 billion people suffering from hypertension in the world, most of whom live in low and middle income

countries. The number of hypertension sufferers in Indonesia according to the Ministry of Health (2018) is 34.1%. According to the East Java Health Service (2021), the number of hypertension sufferers aged ≥15 years in East Java Province is around 11,686,592 people. According to the Jember District Health Service (2020), there are 741,735 people suffering from hypertension. According to the results of a preliminary study at X Hospital in January - December 2022, cases of hypertension in outpatient settings were 4,774 patients suffering from hypertension based on the data obtained.

Hypertension is divided into two types, namely primary (essential) hypertension and secondary hypertension. Primary (essential) hypertension is a type of hypertension where no cause is found for the increase in blood pressure. Primary hypertension can be said to be a multifactorial disease which is influenced by genetic and environmental factors which trigger an increase in blood pressure which will be made worse by diabetes, obesity, stress and other bad lifestyle habits. Meanwhile, secondary hypertension can be caused by kidney failure, hyperaldosteronism, renovascular disease, endocrine disease, and other causes (Anggriani, 2018).

The most important and first step in treating hypertension in someone who has been diagnosed with hypertension is modifying their lifestyle and after that administering medication. The main goal in treating hypertension is to reduce mortality and morbidity that is related to or most likely caused by a person suffering from organ damage. The target blood pressure value recommended in JNC VII is below <140/90 mmHg.

If the recommended blood pressure target is not achieved, it can cause several problems, including complications, decreased quality of life, increased treatment costs for hypertension, namely stroke (51%), visual impairment, and kidney failure. To overcome this problem, non-pharmacological treatment and pharmacological treatment can be used.

Various types of antihypertensive drugs, namely: alpha blockers, betablockers, ACE inhibitors, diuretics and vasodilators. The stage of using antihypertensive drugs recommended by WHO is monotherapy with one of the diuretic drug groups, beta blockers, ACE inhibitors, calcium channel blockers, and alpha blockers. The five drug groups mentioned above were chosen as the first phase of antihypertensive drugs, because they do not cause many side effects. annoying and does not cause tolerance during long-term administration, so it can be used as monotherapy (Soraya, 2018). The drugs frequently used by hypertension patients at X Hospital are amlodipine, candesartan and valsartan.

Pharmaceutical services are one of the health services in hospitals that can be expected to meet service standards. According to the Minister of Health Regulation (PMK) number 72 of 2016 concerning pharmaceutical service standards in hospitals, it is stated that a hospital is a health service institution that provides comprehensive individual health services that provide inpatient, outpatient and emergency services. Pharmaceutical services are direct and responsible services to patients related to pharmaceutical preparations with the aim of achieving definite results to improve the patient's quality of life. One of the clinical pharmacy services includes assessment and prescription services. One of the clinical pharmacy services chosen by the researchers was the drug information service (PIO) because they wanted to know the profile of antihypertensive drug use in the hospital.

METHODS

This research includes non-experimental research with a retrospective descriptive research design. The data source in this research is the patient's electronic medical record data. Samples were taken using a total sampling technique which met the inclusion criteria as many as 44 patients. This research was conducted in the medical records room at X Hospital Jember with data for January-December 2022. Data is displayed in frequency and percentage form.

RESULTS

Table 5.1 Patient characteristics based on age of hypertensive patients in the Outpatient Installation of X Hospital Jember January-December 2022

No.	Age	Frequency	Percentage
1.	30-60 years	24	54,5%
2.	>61 years	20	45,5%
	Total	44	100%

Source: X Hospital Medical Records

Table 5.2 Patient characteristics based on gender of hypertensive patients in the Outpatient Installation of X Hospital Jember January-December 2022.

No.	Gender	Frequency	Percentage
1.	Male	22	50%
2.	Female	22	50%
	Total	44	100%

Source: X Hospital Medical Records

The following are the results of researchon 44 patients based on age in hypertensive patients at the X Hospital Jember Outpatient Installation which can be seen in table 5.1 Based on table 5.1, data shows that the majority of people aged 30-60 years occupy a percentage of 54.5% (24 patients), 45.5% (20 patients) are >61 years old. The following are the results of research on 44 patients based on gender in hypertensive patients at the X Hospital Jember Outpatient Installation, which can be seen in table 5.2 Based on table 5.2, data shows that the number of women is the same as the number of men, namely at a percentage of 50%. The following are the results of research on 44 patients based on comorbidities in hypertensive patients at the X Hospital Jember Outpatient Installation, which can be seen in table 5.3.

Table 5.3 Patient characteristics based on comorbidities of hypertension patients in the Outpatient Installation of X Hospital Jember January-December 2022

No.	Concomitant Disease	Frequency	Percentage
1.	Patients with comorbidities	4	9%
2.	Patients without comorbidities	40	91%
	Total	44	100%

Source: X Hospital Medical Records

Based on table 5.3, data shows that the majority of patients are without comorbidities, namely 91% (40 patients), and for patients with comorbidities, it is 9% (4 patients). The following are the results of research on 44 patients based on drug categories for hypertensive patients at the X Hospital Jember Outpatient Installation, which can be seen in table 5.4 Based

on table 5.4, it is found that almost half of the drug categories use a single drug with a percentage of 48% (21 patients).

Table 5.4 Patient characteristics based on drug category for hypertension patients in the Outpatient Installation of X Hospital Jember January-December 2022

No.	Drug Category	Frequency	Percentage
1.	Single	21	48%
2.	Combination of 2 Groups	18	41%
3.	Combination of 3 Group	5	11%
	Total	44	100%

Source: X Hospital Medical Records

Table 5.5 Patient characteristics based on drug class for hypertension patients in the Outpatient Installation of X Hospital Jember January-December 2022

Drug Category	Golongan Obat	Frekuensi	Persentase
Single	CCB	8	18,4%
	ARB	12	27,3%
	ACEI	1	2,2%
Combination of 2 Groups	ACEI+CCB	2	5,0%
	ARB+CCB	9	20,1%
	BB+ARB	5	11,0%
	CCB+BB	2	5,0%
Combination of 3 Groups	ARB+ARB+CCB	1	2,2%
	BB+Diuretik+ARB	1	2,2%
	CCB+ACEI+ACEI	1	2,2%
	ACEI+BB+CCB	1	2,2%
	ARB+CCB+BB	1	2,2%
Total		44	100%

Source: X Hospital Medical Records

Table 5.6 Patient characteristics based on type of medication for hypertension patients in the Outpatient Installation of X Hospital Jember January-December 2022

Drug Category	Drug Class	Drug Type	Frequency	Percentage
Single	CCB	Amlodipin	8	18,4%
	ARB	Candesartan	12	27,3%
	ACEI	Lisinopril	1	2,2%
Combination of 2 Groups	ACEI+CCB	Lisinopril+Amlodipin	2	5,0%
	ARB+CCB	Candesartan+Amlodipin	5	11,0%
	ARB+CCB	Candesartan+Adalat Oros	2	5,0%
	ARB+CCB	Valsartan+Amlodipin	2	5,0%
	BB+ARB	Bisovell+Valsartan	1	2,2%
	BB+ARB	Bisoprolol+Candesartan	4	9,0%
	CCB+BB	Amlodipin+Bisoprolol	2	2,2%
Combination of 3 Groups	ARB+ARB+CCB	Candesartan+Canderin+ Amlodipine	1	2,2%
	BB+Diuretik+ARB	Bisoprolol+Spirolacton + Candesartan	1	2,2%
	CCB+ACEI+ACEI	Amlodipine+Lisinopril+ Lisinopril	1	2,2%
	ACEI+BB+CCB	Lisinopril+Bisoprolol+ Amlodipin	1	2,2%

	ARB+CCB+BB	Candesartan+Amlodipin +Bisoprolol	1	2,2%
Total			44	100%

Source: X Hospital Medical Records

The following are the results of research on 44 patients based on drug class in hypertensive patients at the X Hospital Jember Outpatient Installation, which can be seen in table 5.5 Based on table 5.5, it is found that almost half of the patients use the ARB group. The following are the results of research on 44 patients based on the type of medication in hypertensive patients at the X Hospital Jember Outpatient Installation, which can be seen in the table. Based on table 5.6, it can be seen that almost half of the patients used the drug candesartan.

Table 5.7 Patient characteristics based on drug dosage for hypertension patients in the Outpatient Installation of X Hospital Jember January-December 2022

Drug Category	Drug Class	Drug Type	Frequency	Percentage
Sigle	CCB	Amlodipin 1x5mg	7	15,2%
	CCB	Amlodipin 1x10mg	1	2,2%
	ARB	Candesartan 1x8mg	8	18,4%
	ARB	Candesartan 1x16mg	4	9,0%
	ACE	Lisinopril 1x10mg	1	2,2%
Combination of 2 Groups	ACEI+CCB	Lisinopril 1x10mg + Amlodipin1x10mg	1	2,2%
	ACEI+CCB	Lisinopril 1x10 + Amlodipin 1x5mg	1	2,2%
	ARB+CCB	Candesartan 1x8mg + Amlodipin 1x5mg	2	5,0%
	ARB+CCB	Candesartan 1x8mg + Amlodipin 1x10mg	1	2,2%
	ARB+CCB	Candesartan 1x16mg + Amlodipin 1x10mg	2	5,0%
	ARB+ CCB	Candesartan 1x16mg + Adalat Oros 1x30mg	2	5,0%
	ARB+CCB	Valsaran 1x160mg + Amlodipin 1x5mg	1	2,2%
	ARB+CCB	Valsartan 1x160mg + Amlodipin 1x10mg	1	2,2%
	BB+ARB	Bisovell 1x2,5mg + Valsartan 1x160mg	1	2,2%
	BB+ARB	Bisoprolol 1x2,5mg + Candesartan 1x16mg	2	5,0%
	BB+ARB	Bisoprolol 1x2,5mg + Candesartan 1x8mg	1	2,2%
	BB+ARB	Bisoprolol 1x2,5mg + Candesartan 1x16mg	1	2,2%
	CCB+BB	Amlodipin 1x5mg + Bisoprolol 5x5mg	1	2,2%
	CCB+BB	Amlodipin 1x5mg + Bisoprolol 5x2,5mg	1	2,2%
Combination of 3 Groups	ARB+ARB+CCB	Candesartan 1x16mg + Canderin1x16mg + Amlodipin1x10mg	1	2,2%
	BB+Diuretik+ARB	Bisoprolol 1x2,5mg + Spirolacton 1x2,5mg + Candesartan 1x16mg	1	2,2%
	CCB+ACEI+ACEI	Amlodipine 1x10mg + Lisinopril 1x5mg + Lisinopril 1x10mg	1	2,2%
	ACEI+BB+CCB	Lisinopril 1x10mg + Bisoprolol 1x2,5mg + Amlodipin1x10mg	1	2,2%

	ARB+CCB+BB	Candesartan 1x16mg + Amlodipin 1x5mg + Bisoprolol 1x2,5mg	1	2,2%
Total			44	100%

Source: X Hospital Medical Records

The following are the results of research on 44 patients based on drug doses for hypertensive patients at the X Hospital Jember Outpatient Installation, which can be seen in table 5.7 Based on table 5.7, it can be seen that a small number of patients received a dose of 1x8 mg of the drug candesartan.

DISCUSSION

Based on the results of research on the use of hypertension drugs based on the category of drugs used in hypertensive patients at X Hospital, Jember. This can be seen in the percentage of patients in the drug category almost half, namely using a single drug with a percentage of 48% (21 patients). This research is not much different from the research conducted by Tutoli et al in 2021 at the Tilamuta Health Center. Where the results obtained in this study show that the use of a single drug is more often prescribed in hypertensive patients.

Based on JNC VIII hypertension therapy management, initial treatment of hypertension does not require a combination of two drugs but only requires single therapy. Combination therapy is used if the patient with single therapy does not show blood pressure achievement. Combination therapy in hypertensive patients who receive the first treatment can also result in a rapid and strong decrease in blood pressure, which can result in an uncontrolled decrease in blood pressure. In patients with stage II hypertension, combination therapy is very necessary to achieve the desired blood pressure target. Especially in patients with compelling indications which aim to avoid further organ damage. JNC VIII recommends that combination drugs can be given if the blood pressure is 20/10 mmHg above the target blood pressure, namely <150/90 mmHg (Tutoli *et al*., 2021).

This study shows that patients with the highest percentage of drug categories are patients who use single drugs, because single drugs are the first line drugs in lowering blood pressure in hypertensive patients. Combination antihypertensive drugs are needed if a single antihypertensive is not able to control the desired blood pressure target. Commonly known antihypertensive drugs are diuretics, ACEI, ARB, and BB.

Based on the results of research on the use of hypertension drugs based on the drug classes used in hypertensive patients at X Hospital Jember. It can be seen in table 5.5 that almost half the number of patients, namely 27.3% (12 patients) used the ARB group. This research is not much different from the research conducted by Khairiyah *et al* (2022) at Sultan Syarif Mohamad Alkadrie Hospital Pontianak. Where the results obtained in this study show that the use of ARB drugs is more often prescribed to hypertensive patients.

According to Khairiyah *et al* (2022), the ARB antihypertensive drug that is also prescribed is telmisartan. ARB has a mechanism of action by inhibiting the binding of compounds that have the effect of narrowing blood vessels, called Angiotension II. Angiotensin II's binding to the receptor is inhibited so that blood vessels widen and blood flow is smoother and blood pressure decreases. The ARB group can be given as an alternative for patients who cannot tolerate ACEIs, such as having a dry cough (Khairiyah et al., 2022). The

use of ARB drugs with ACEI is not recommended, this combination of drugs can increase the risk of serious side effects, acute kidney damage and hyperkalemia. In addition, concurrent use of tacrolimus with ARB drugs can also increase the risk of hyperkalemia and/or nephrotoxicity (Momuat & Annisaa', 2023). Meanwhile, thiazide diuretics have a mechanism of action by reducing peripheral vascular resistance in the long term while reducing circulating blood volume in the short term by inhibiting Na reabsorption by the distal tubule. Diuretic drugs and their derivative compounds have an antihypertensive effect when used as a single antihypertensive and this drug will increase the efficacy of almost all other antihypertensive drugs (Khairiyah *et al.*, 2022).

This study shows that the use of ARB drugs is more often prescribed to hypertensive patients at RS X Jember. This is possible because ARBs have several advantages, such as being able to treat heart failure accompanied by hypertension, can also treat chronic kidney disease, prevent further damage after heart attacks, even strokes, and can reduce albuminuria levels in patients.

Based on the results of research on the use of hypertension drugs based on the type of drugs used in hypertensive patients at RS X Jember. It can be seen in table 5.6 that almost half the number of patients, namely 27.3% (12 patients) used the drug candesartan. This research is not much different from research conducted by Momuat and Annisaa in (2023) at RSUP Dr. Kariadi Semarang. The results obtained in this study show that the use of the drug candesartan is more often prescribed to hypertensive patients.

Candesartan is a long-acting antihypertensive agent whose activity is more effective than other drugs in the ARB class. Candesartan is usually recommended to be taken once a day as an initial dose, the dose can be doubled every less than 2 weeks. Candesartan is an example of an ARB class of drugs used in hypertension therapy. According to Momuat and Annisaa (2023) candesartan is one of the drugs most widely used in the treatment of hypertension. This may be because candesartan is a highly selective compound and has high potency, as well as a long duration of action. Several clinical trials have shown that candesartan is an effective agent in reducing the risk of death related to cardiovascular disease, stroke, heart failure, arterial stiffness, renal failure, retinopathy, and migraine in adult patient populations with type 2 DM, metabolic syndrome, or other disorders. kidney (Momuat & Annisaa', 2023).

Based on the results of research on the use of hypertension drugs based on the type of drugs used in hypertensive patients at RS X Jember. It can be seen in table 5.7 that it was found that a small number of patients, namely 18.4% (8 patients) received a dose of 1x8 mg of the drug candesartan. Based on JNC VIII, this research is appropriate, because it does not exceed the recommended dose, where the results obtained in the research show that the most widely used dose is candesartan 1x8mg/day.

Dosage is an important aspect to determine the efficacy of a drug. If the dose of a drug is too high, especially drugs that have a narrow therapeutic range, there is a very high risk of causing side effects. However, if the drug dose is given below the therapeutic range, it does not guarantee that the blood pressure target will be achieved. The dose of antihypertensive medication given to patients in this study can be said to be the correct dosage if the antihypertensive medication is within the minimum dosage range and daily dosage recommended in the JNC VIII guidelines (Ismaya & Emelia, 2022). This study shows that the dose given for candesartan is 8 mg once a day, while the therapeutic dose range for candesartan

is 8-32 mg per day with a frequency of use of 1-2 times per day. Insufficient dosage can result in the failure of a therapy, therefore it is very important to ensure that the therapeutic dose is in accordance with the recommended therapeutic range. Other studies show that candesartan is a drug with high benefits when given to hypertensive patients complicated by kidney problems, because this drug has been proven to reduce albuminuria levels in patients. Candesartan at a dose of 8-16 mg/day can reduce IMT (Body Mass Index) and AMI (Acute Myocardial Infarction), the use of candesartan as an early antihypertensive has a beneficial effect on cerebral and myocardial ischemia (Firmansyah *et al.*, 2021).

It can be seen that in this study it exceeded the recommended dose of JNC VIII but did not exceed the maximum recommended dose. This is because most patients treated at RS X Jember suffer from stage 2 hypertension, so the dose of candesartan is increased.

Based on JNC VIII, this research is appropriate, because it does not exceed the recommended dose, where the results obtained in the research show that the most widely used dose is candesartan 1x8mg/day.

CONCLUSIONS

Almost half of the drug categories for hypertensive patients at X Hospital Jember, 48% (21 patients) use a single category. Almost half of the use of antihypertensive drugs in hypertensive patients at X Hospital Jember, 27.3% (12 patients) used ARB drugs. Almost half of the drug use in hypertensive patients at X Hospital Jember, 27.3% (12 patients) used candesartan. The use of dose-related drugs in hypertensive patients at Hospital X Jember was small, 18.4% (8 patients) received candesartan at a dose of 1x8mg/day.

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