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Evaluation of the use of Antihypertensive Drugs in Outpatient Hypertension Patients at the Lasinrang Regional General Hospital, Pinrang Regency in 2023

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Abstract

Hypertension is a complex condition in which blood pressure is permanently above normal. Hypertension is an increase in systolic blood pressure of more than equal to 140 mmHg and diastolic more than equal to 90 mmHg. This study aims to identify how antihypertensive drugs are used in hypertensive patients at the Lasinrang Regional General Hospital, Pinrang Regency. This study is a non-experimental research with a descriptive design taken retrospectively. The sample in this study is all outpatients with a diagnosis of hypertension at the Lasinrang Regional General Hospital in 2023. The sampling technique used is purposive sampling. The sample of this study is medical record data on hypertension patients in 2023 which is adjusted to the inclusion criteria. The results of the study showed that from 83 samples consisting of 50 women and 33 men, all of which met the inclusion and exclusion criteria, and showed a prevalence of age that dominated around 58-65 years (49,40%). In the evaluation of drug use, outpatient hypertension patients at the Lasinrang Regional General Hospital, Pinrang Regency had an indication accuracy of 100%, 100% drug accuracy, and 100% dose accuracy.

Keywords: Hypertension, Outpatient, Evaluation of Drug Use

1. INTRODUCTION

Hypertension is an increase in systolic blood pressure greater than 140 mmHg and diastolic blood pressure greater than 90 mmHg. Hypertensive patients are at the highest risk for stroke and cardiovascular disease (Ministry of Health, 2021).

Hypertension is called the silent killer because the symptoms are often asymptomatic. Most patients do not know they have hypertension and only find out when complications occur. The only way to prevent this is to control your blood pressure. Hypertension can be prevented by controlling risky behaviors such as smoking, unhealthy diet, insufficient consumption of fruits and vegetables, and excessive consumption of salt [1].

Hypertension epidemiology, which is the global prevalence of hypertension patients around 1.13 billion patients in 2015. Overall, the prevalence of hypertension is about 30-45% in adults. The risk of hypertension increases progressively with age, with a prevalence of >60% at the age of >60 years. According to the Basic Health Research Report (Riskesdas), there has been an increase in the prevalence of hypertension from 25% (2013) to 34.1% (2018) [2].

According to WHO data (2018), worldwide, around 972 million people or 26.4% have hypertension, this figure is likely to increase to 29.2% in 2021 [2]. It is estimated that every year 9.4 million people die from hypertension and complications. 333 million of the 972 million people with hypertension are in developed countries and the rest are in developing countries, one of which is Indonesia [2]. Hypertension causes approximately 8 million deaths each year, 1.5 million of which occur in Southeast Asia. In Indonesia, the 2018 Basic Health Survey (Riskesdas) showed an increase in the prevalence of hypertension in Indonesia, with a population of about 260 million, was 34.1% compared to 25.8% in Riskesdas in 2013. It is estimated that only a quarter of hypertension cases in Indonesia are diagnosed, and data show that only 0.7% of diagnosed hypertension patients take antihypertensive medication [3]

The South Sulawesi Provincial Health Office in 2014, where there were new patients with essential hypertension (primary) with a total of 5,902 cases, of which 7,575 cases were old patients, with 65 deaths, heart hypertension with 1,687 cases, and new patients with 1,670 cases, where 24 people died, renal hypertension with 58 new patient cases, long-term patients with a total of 34 cases, of which 5 people died, heart and secondary hypertension of long-term patients with a total of 2,082. cases and new patients with a total of 2,081 cases, of which 18 people died.

Hypertension can be treated with medication or lifestyle changes. Lifestyle changes can be made by limiting salt intake to no more than 1/4-1/2 teaspoon (6 grams/day), losing weight, avoiding caffeinated beverages, cigarettes, and alcoholic beverages. Exercise is also recommended for people with hypertension, it can be in the form of jogging and controlling stress. For the selection and use of hypertension medications, it is recommended to consult a doctor. The increase or decrease in the prevalence of hypertension is influenced by how well patients follow the instructions of health care professionals.

A wide range of antihypertensive drugs, namely: alpha blockers, beta blockers, ACE inhibitors, diuretics and vasodilators. The stage of use of antihypertensive drugs recommended by the WHO is monotherapy with one of the classes of diuretics, beta-blockers, ACE inhibitors, calcium channel blockers and alpha-blockers. The above five groups of drugs have been selected as the first stage of antihypertensive drugs because they do not cause many troublesome side effects and do not cause hypertension. Tolerance to long-term administration so that it can be used as monotherapy [4].

The use of the right medication for people with hypertension is necessary for treatment to be effective. Ineffective use of medications can lead to treatment failure. The high incidence of inaccurate drug selection is due to various efforts to improve health care. Assessment of the accuracy of drug selection is needed to achieve the therapeutic goal of reducing cardiovascular morbidity and mortality [5].

The negative effects of improper selection of antihypertensive medications are very broad and complex, and can make blood pressure difficult to control and lead to other diseases such as heart attack, stroke, and kidney disease [6]. When many options are available for the same purpose, cost-effectiveness analysis can be used to determine which program or treatment is most appropriate [28].

2. METHODS

This research will be conducted from June 2024 to completion. Data collection was conducted at Lasinrang Regional General Hospital Pinrang Regency. This research was conducted observatively using a qualitative method that is descriptive. By obtaining data from the patient's medical records retrospectively using the purposive sampling method. The number of samples obtained from the calculation using the Slovin formula was 83 samples. Based on the population, the inclusion and exclusion criteria in sampling are as follows: Inclusion criteria Patients diagnosed with hypertension at Lasinrang Regional General Hospital Pinrang Regency, Outpatient therapy patients using antihypertensive drugs, hypertensive patients aged >18 years. Exclusion criteria are criteria where the research subject is not eligible as a research sample and can not be used as a research sample As part of the study, namely pregnant women, medical record data was damaged, illegible, incomplete, and died.

3. RESULT AND DISCUSSION

The aim of antihypertensive drug utilization evaluation is to ensure the rational use of antihypertensive drugs in patients with hypertension. Rational use of medication is essential to improve the success of therapy. If the patient with hypertension is not treated, it can cause complications and worsen the patient's condition. Medication is said to be rational and safe if the drugs used by the community do not cause harm that can cause problems or threats to their health [7].

This study was conducted at Lasinrang Regional General Hospital, Pinrang Regency for about one month in June, titled "Evaluation of the Use of Antihypertensive Drugs in Outpatient Hypertension Patients at the Lasinrang Regional General Hospital, Pinrang Regency in 2023". The research data was obtained from the medical records of patients at the Lasinrang Regional General Hospital who used antihypertensive drugs.

Table 3. Patient Characteristics By Gender

Gender	Number Of Patients	Percentage (%)
Male	33	39,76
Female	50	60,24
Total	83	100

The table above shows that hypertension patients at Lasinrang Regional General Hospital by gender are most patients who are female, as many as 50 people (60.24%) and 33 people (39.76%). Most hypertension patients at Lasinrang Regional General Hospital are female patients.

This is similar to a study conducted by Aryzki et al. (2018) [8], which found that more women experience hypertension related to the menopausal process because estrogen levels continue to decline, which affects high-density lipoprotein (HDL) levels. HDL, which functions to protect blood vessels from damage, is also reduced, causing women to suffer from hypertension more than men.

This is because postmenopausal women are twice as likely to have high blood pressure as premenopausal women. During menopause, estrogen levels continue to decline, causing high-density lipoprotein (HDL) levels to drop and causing women to suffer from high blood pressure more often than men.

The hormone estrogen is a hormone that also affects the development of hypertension, this estrogen plays a role in increasing HDL levels. High levels of HDL are a protective factor against atherosclerosis, which is one of the causes of hypertension [9].

Table 4. Patient Characteristics By Age

Age	Number Of Patients	Percentage (%)
18 – 27	2	2,41
28 – 37	5	6,02
38 – 47	7	8,43
48 – 57	18	21,69
58 – 65	41	49,40
>65	10	12,05
Total	83	100

Based on the table above, it shows that hypertension patients at Lasinrang Regional General Hospital have characterustics based on age, the most common age range is 41 patients (49,40%) and the lowest is patients who have an age range of 18-27 as many 2 patients (2,41%).

Based on the results of the study, blood pressure will increase along with the increasing age of a person. As we age, physiological factors in the body such as the heart and blood vessels will change [10].

This finding is reinforced by the study of Wasilah et al (2022) [9], which obtained the majority of hypertensive patients at the age of 56-65 years. Blood pressure increases with age. An increase in blood pressure is caused by structural and functional changes in the large blood vessels in the body, so that the lumen becomes narrower and the walls of the blood vessels become stiffer, so that blood in each heartbeat is forced to pass through narrower blood vessels than usual, causing an increase in blood pressure [11].

Age affects the occurrence of hypertension, as you get older, the risk of developing hypertension will be greater, so that the prevalence of hypertension among the elderly is quite high, which is about 40% with deaths around over 65 years old. The high level of hypertension with age is caused by structural changes in the large blood vessels so that the lumen becomes narrower and the walls of the blood vessels become stiffer as a result of increased blood pressure [12].

Table 5. Clasification of Hypertension

Blood Pressure	Sistole/Diastole (mmHg)	Number Of Patients	Percentage (%)
Normal	<120/<80	0	0
Pre hypertension	120-139/80	7	8,43
Hypertension Stage 1	140-159/90	35	42,17
Hypertension Stage2	≥160/≥100	41	49,40
Total		83	100

The table above shows the percentage of blood pressure at Lasinrang Regional General Hospital, Pinrang Regency, which is the highest, namely grade 2 hypertention as many as 41 patients (49.40%) out of 83 patients. This study is consistent with research conducted by Haerani (2021) [13] shows that the highest percentage of stage 2 hypertension was obtained in 65 patients (67.7%), for diastolic usually require drug therapy in combination to lower or maintain blood pressure, the choice of drugs for these cases is adjusted to the age of the patient.

Usually, hypertension requires lifelong treatment to keep it under control. Based on the JNC VIII hypertension treatment algorithm, in addition to providing patients with pharmacological therapy, non-pharmacological therapy is also needed, namely by making lifestyle changes [14].

Table 5. Use of Antihypertensive Drugs

Antihypertensive Drugs	Number Of Patients	Percentage (%)
Single	38	45,78
Combination	45	54,22
Total	83	100%

The table above shows that the use of combination antihypertensive drugs in Lasinrang Regional General Hospital is more, namely 45 patients (54.22%), while single antihypertensive drugs are used in only 38 patients (45.78%). In this study, it was found that combination antihypertensive drugs are more widely used than single antihypertensive drugs.

This research is consistent with the research conducted by L. Musnelina at Depok City Hospital, the highest percentage of primary hypertension in the type of combination therapy is 56.92%. A combination of antihypertensive drugs is required by most patients to achieve blood pressure targets, but treatment with a combination of drugs can increase the cost of treatment and lower patient compliance as the number of drugs to be taken increases. On the other hand, this type of therapy with a combination of drugs is highly recommended to produce additive effects, synergistic and can reduce drug side effects.

Combinations of antihypertensive drugs should be chosen from different groups, starting with lower doses to increase effectiveness and reduce the potential for side effects [15].

Table 6. Use of Single Antihypertensive Drug

Single Group	Number Of Patients	Percentage (%)
CCB Amlodipine 10mg	19	50,00
ACEI Captopril 25mg	4	10,53
ARB Candesartan 8mg	8	21,05
DIURETIK Furosemide 40mg	2	5,26
ARB Valsartan 80mg	3	7,89
Beta Bloker Bisoprolol 2,5mg	2	5,26
Total	38	100

The table above shows the use of a single antihypertensive drug, CCB is the most prescribed drug in patients, namely 19 patients (50.00%) get a prescription for amlodipine, the second most prescribed drug is the ARB group which is as many as 8 patients (21. 05%) on candesartan, the third drug prescribed is ACEI on captopril as many as 4 patients (10.53%), and the last drug prescribed is the diuretic group on furosemide, beta blocker in bisoprolol was 2 patients (5.26%).

The use of single antihypertensive drugs in hypertensive patients at Lasinrang Regional General Hospital is the CCB group with a prescription of amlodipine as many as 19 patients (50,00%).

This is consistent with research conducted at the Perumnas 1 Health Center in Pontianak City in the antihypertensive monotherapy therapy group, the most widely used is the CCB group, namely amlodipine as much as 92.16%. The CCB group can reduce peripheral vascular resistance [16].

Amlodipine belongs to a group of CCBs that are vasculoselective, have relatively low oral bioavailability, a long half-life, and slow absorption to prevent a sudden drop in blood pressure. CCBs inhibit calcium influx into smooth muscle cells of blood vessels and heart muscle. Amlodipine is very useful for emergency hypertension because the initial dose of 10 mg can lower blood pressure within 10 minutes [17]. The CCB group can lower blood pressure by relaxing the smooth muscle of the arterioles and reducing peripheral vascular resistance [16].

In addition, the use of this amlodipine drug also does not have metabolic side effects, both on lipids, blood sugar and uric acid. This is consistent with the mechanism of action of amlodipine, which is to inhibit the entry of transmembrane calcium ions into the heart and vascular smooth muscle. Calcium ions play a role in the contraction of smooth muscle by inhibiting the uptake of calcium ions, resulting in relaxation of vascular smooth muscle so that they can lower blood pressure [18].

Table 7. Use of combination antihypertensive drugs

Combination group	Number Of Patients	Percentage (%)
ARB+CCB Candesartan+Amlodipine	37	82,22
DiuretikI+CCB Captopril+Amlodipine	3	6,67
Beta Bloker+CCB Valsartan+Amlodipine	5	11,11
Total	45	100

Based on the above table, it shows that the use of antihypertensive drugs in the combination of ARB+CCB is the most prescribed drug for patients, namely 37 patients (82.22%) get a prescription of Candesartan + Amlodipine, then for the second combination, namely the Diuretic+CCB group, as many as 3 patients (6. 67%) receive a prescription for furosemide + amlodipine, and in the third combination, namely the beta-blocker+CCB group, as many as 2 patients (11.11%) receive a prescription for bisoprolol+amlodipine.

This study is consistent with research conducted at RSI Sultan Agung Semarang, for antihypertensive the most commonly used combination is a combination of CCB and ARB (58.70%). The combination of ARB and CCB of the two drugs can provide a synergistic effect by targeting two pathways of action through one mechanism to lower blood pressure [19].

The combination of amlodipine and candesartan is the right combination because they both work by different mechanisms to lower blood pressure. Drugs with different mechanisms of action can control blood pressure with minimal toxicity [20].

Combinations of antihypertensive drugs should be chosen from different groups, starting with lower doses to increase efficacy and reduce the potential for side effects (Brunton, 2011) [21]. A combination of CCB and ARB is used to prevent the occurrence of diabetic nephropathy in patients with diabetes mellitus and hypertension [21].

According to JNC VIII [22], stage 1 hypertension is treated with a single treatment such as ACEI, ARB, CCB or thiazide diuretics, while stage 2 hypertension is treated with combination therapy. According to JNC VIII, stage 2

hypertension does not have the effect of lowering blood pressure with one type of drug, so to achieve the desired therapeutic effect, the initial stage with the administration of combination therapy. Based on JNC VIII, the administration of combination therapy of ACEI and ARB at the same time is not allowed because it will increase the effects of kidney failure and stroke [23].

Table 9. Drug Accuracy at Lasinrang Regional General Hospital Pinrang Regency

Drug Accuracy	Number Of Patients	Percentage (%)
Appropriate	83	100
Not Exactly	0	0
Total	83	100

Based on the table above, the selection of therapy is carried out after the diagnosis is enforced, the drugs selected and prescribed must have a therapeutic effect in accordance with the diagnosis that has been established, from the medical record data obtained as many as 83 patients (100%) who are appropriately given antihypertensive drugs, all in accordance with the standard of treatment therapy.

This research is consistent with Ekaningtyas (2021) [24] conducted at the Kolongan Health Center, North Minahasa Regency, which showed that the right drug in the use of antihypertensive drugs was 100%

The rationale for the use of antihypertensive drugs is seen from the accuracy of medication of hypertensive patients who undergo outpatient treatment at the Lasinrang Regional General Hospital, who received antihypertensive drugs in accordance with therapy based on the JNC VIII guideline as many as 83 patients.

The figure above shows that the accuracy of medication given to hypertensive patients at the Lasinrang Regional General Hospital as many as 83 patients with a percentage of 100% occurred because the doctor had given the drug in accordance with the hospital formulary and JNC VIII guidelines [25].

Table 10. Dose Accuracy at Lasinrang Regional General Hospital, Pinrang Regency

Dose Accuracy	Number Of Patients	Percentage (%)
Appropriate	83	100
Not Exactly	0	0
Total	83	100

Based on the above table, most of the antihypertensive drugs in Lasinrang Regional General Hospital can be said to be in the correct dosage, namely 83 patients (100%) received a prescription in accordance with the dosage specified in the JNC VIII guideline and the hospital formulary [25].

This research is consistent with the research conducted by Tri Wasilah, et al at H. Hanafie Hospital, which found that out of a total of 78 patients (100%), the dose was correct. This is in accordance with the guidelines of the sixth edition of the Pharmacotherapy Handbook and JNC 8 of 2014. It was also explained from the research of Pande Made and colleagues in 2015 that if the prescription of antihypertensive drugs is within the minimum dose range and the recommended daily dose, then the prescription is said to be the right dose.

The correct dose is the suitability of the dose of the drug given on the basis of the single dose, the frequency of the day given to patients diagnosed with hypertension. If the prescription of antihypertensive drugs is in the minimum dose range and the recommended daily dose, then the dosage is said to be the right dose.

Drug dose is the amount of medication used by a patient to achieve the expected therapeutic effect. Dosage is one of the most important aspects in determining drug efficacy. If the dose given is too low or below the therapeutic range, the expected therapeutic effect will not be achieved, and if the dose given is too high, especially if the drug

has a narrow therapeutic range, it will be very risky to cause an overdose (Sa'idah et al., 2019). The correct dose is the suitability of the dose of antihypertensive drugs with the therapeutic dose range, verified by the dose of use per day based on the special condition of the patient.

Not taking the right dosage or not following the standards will have a great impact on patients. If the patient receives antihypertensive drug therapy that is inappropriate or not in accordance with the standards, then the desired therapeutic effect will not be appropriate and will cause side effects or complications [13].

JNC VIII stated that there are 3 strategies in increasing the dose of antihypertensive drugs, namely the first level 1 treatment starts with monotherapy, if the blood pressure target has not been reached, the dose is gradually increased, and if the blood pressure target is still not reached, a second drug is added before the first drug reaches its maximum dose, then the second dose of the drug is gradually added to reach the blood pressure target. The last strategy is to start therapy with a combination of 2 drugs, either separately or in combination in 1 preparation [26].

The administration of drugs in elderly patients needs to be considered several things, including the dosage setting because at an advanced age, a patient is more prone to adverse reactions and adverse drug interactions (27).

Table 11. Accuracy of Indications at Lasinrang Regional General Hospital Pinrang Regency

Accuracy of Indications	Number Of Patients	Percentage (%)
Appropriate	83	100
Not Exactly	0	0
Total	83	100

Based on the above table, it can be seen that all antihypertensive drugs prescribed to patients at Lasinrang Regional General Hospital are in accordance with the indications of the patient's disease and in accordance with the patient's pharmacotherapy needs.

The results of this study are consistent with Ekaningtyas (2021) conducted at the Kolongan Health Center, North Minahasa Regency, which showed that patients who had the right indications for the use of antihypertensive drugs were 133 respondents (100%).

The right indication is the suitability of drug administration between the indication and the diagnosis made by the doctor [9]. Antihypertensive drugs are administered according to needs and pharmacotherapy and benefits. Evaluation of the accuracy of indications is seen from whether the patient needs to be given antihypertensive drugs based on blood pressure.

Evaluation of the accuracy of indications is seen from the need for patients to be given antihypertensive drugs based on blood pressure in accordance with JNC VIII treatment. In this study, the value of the accuracy of the indication of antihypertensive drugs at the Lasinrang Regional General Hospital was 100%, while the inaccuracy of the indication was non-existent.

4. CONCLUSION

Based on the results of the research conducted at Lasinrang Regional General Hospital, Pinrang Regency in 2023, the following conclusions can be drawn:

1. The evaluation of the use of antihypertensive drugs at the Lasinrang Regional General Hospital, Pinrang Regency is corrected 100%.
2. Evaluation of the use of Antihypertensive drugs at Lasinrang Regional General Hospital, Pinrang Regency is corrected dose 100%.

3. Evaluation of the use of antihypertensive drugs in Lasinrang Regional General Hospital, Pinrang Regency is corrected 100%.

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