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Profile of The Use of Antihypertension Drug and Blood Pressure Evaluation at Gresik Hospital

Prada Marwah Al Kamilah¹, Lusiani Tjandra^{2*}, Meivy Isnoviana³, Ibrahim Njoto⁴

Abstract

A potentially fatal non-communicable disease is hypertension. Important organs like the brain, heart, kidneys, retina, big blood vessels (aorta), and peripheral blood vessels are in danger for harm as a result. Heart attacks and even death can result from hypertension. By avoiding and managing risk factors like smoking, sedentary lifestyles, a lack of fruits and vegetables, and obesity, it is crucial to work towards lowering the risk of hypertension. This study's objectives were to assess blood pressure and establish the profile of antihypertensive medicine use. Methods: Data for this retrospective analysis were gathered based on information from patient pharmacy records and medical records. Results: 33.7% hypertension sufferers aged 65-74 years, 62.2% women and 37.8% men, 38.9% The beta-blocker drug group with the drug that is often used Bisoprolol dose of 2.5 mg as much as 26.9 %, 88% in tablet dosage form, which is used in combination form with the rule of using once a day and 64.3% controlled hypertension. This is a retrospective study that obtained data based on medical record information and patient pharmacy data. Conclusion: Hypertension patients are usually aged between 65-74 years, mostly female. Antihypertensive drugs that are often used are in the beta blocker class which is a Bisoprolol dose of 2.5 mg in tablet, used in a single dose or/and combination. Sixty-four point three percent (64.3%) of patients have controlled hypertension.

Keywords: antihypertensive drugs, blood pressure, profile

Original Research Article

INTRODUCTION

A widespread health issue, hypertension affects people all over the world. Around 1.13 billion individuals worldwide have hypertension, according to data from the World Health Organisation (WHO), and the prevalence of hypertension varies by area and racial/ethnic group. It is known that 34.1% of 18-year-olds with hypertension are given a medical diagnosis, according to the 2018

Riskesmas prevalence of hypertension in Indonesia. When compared to the prevalence in 2013, which was 27.8%, this is an increase (RI Ministry of Health, 2020). In Southeast Asia, hypertension causes 1.5 million deaths per year (Woodham et al., 2018)

One of the most serious non-communicable diseases is hypertension. Each person will experience hypertension differently, so there is no set standard for how to measure it. (Ministry of Health RI, 2020; Marhabatsar & Sijid, 2021; Sa'idah, 2018; Yonata & Pratama, 2016) Important organs like the brain, heart, kidneys, retina, big blood vessels (aorta), and peripheral blood vessels are at risk for injury due to hypertension. The risk of hypertension can be decreased by avoiding and managing risk factors including smoking, living a sedentary life, eating little to no fruit and vegetables, and being overweight. Hypertension can induce heart attacks and potentially cause death (Kemenkes RI, 2020; Sari et al., 2017).

Regular physical activity and exercise are used to manage hypertension without the use of medicines, making the heart stronger, more capable, and able to beat regularly. Additionally, due to vasodilation, where the fat that first clogs the blood vessels will reduce, the flexibility of the blood vessels (Dungga, 2020). Angiotensin-converting enzyme inhibitors (ACEi), angiotensin receptor blockers (ARB), beta-blockers, calcium channel blockers (CCB), and diuretics are all used in the pharmacological treatment of hypertension (PERHI, 2022).

Hypertension, often known as high blood pressure, cannot be cured, but it can be managed, particularly by administering the proper antihypertensive medications to avoid problems. Antihypertensive medications help to lower high blood pressure so that complications can be avoided. Further efforts are made to keep blood pressure at 120/80mmHg by informing patients in a straightforward manner about their condition and the consequences that can occur if hypertension is not treated well. It is crucial to utilise antihypertensive medications in order to increase the safety of the best blood pressure medications (Laura et al., 2020).

According to the 2018 Riskesdas data, the prevalence of people in East Java who have hypertension is 36.3%. Increased compared to 2013 data, 26.4%. Hypertension is one of the 10 most common diseases in outpatient and inpatient care. (DinkesJatim, 2021). That's why researchers want to know the profile of the use of antihypertensive drugs and evaluate blood pressure.

Pharmacological management of hypertension involves the use of antihypertensive drugs, which requires patient cooperativity in taking antihypertensive drugs according to recommendations or instructions for use (rule of use), which is one of the determining factors in controlling blood pressure. The non cooperativity for the use of antihypertensives is multi-factorial, such as age, gender, ethnicity, education, employment, economic status, length of treatment, health care system, patients not understanding instructions from health workers regarding treatment, symptoms that do not improve even though the medication has been consumed makes patients not believe that antihypertensive drugs can control their symptoms (Susanto et al., 2019; Unger et al., 2020; ghoulish, TS, 2020; practice, p 2020; Wirakhmi, et al 2021)

Research at the Kintamani I Bali Community Health Center, 70% of hypertension sufferers did not cooperate with hypertension treatment, while at the Pacar Keling Community Health Center, Surabaya, 90% of respondents did not cooperate with hypertension treatment. (Proboningsih et al., 2019; Mathavan et al, 2017) Low cooperation when using antihypertensive drugs leads to uncontrolled blood pressure, and it will worsen the patient's condition, increase the burden of care in the long term, and the emergence of complications including heart disease, stroke, kidney failure, blindness, and even death (Mulyana et al., 2020; Permata Sari Lubis et al., 2022; Sevilla-Cazes et al., 2018).

MATERIALS AND METHODS

This research is a descriptive study whose data collection is retrospective, namely based on medical record data and pharmacy data of 96 hypertensive patients who were treated with medication at Ibnu Sina Gresik Hospital in January - June 2022. This research was conducted from February to June 2023, with 7 variables, namely gender, age, antihypertensive medication, dose, rule of use, amount of

medication given, and blood pressure measurement. Data processing techniques verify completeness or errors in data taking, and data coding to facilitate entry into computer programs. The data was analyzed univariately, where one variable was not related to other variables, to see the overview of the frequency distribution and percentage of each variable. 8 variables were collected and then arranged in a table so that they were easy to read. This research has received ethical feasibility from the Health Research Ethics Commission No. 11/SLE/FK /UWKS/ 2023

RESULTS

Characteristics by age

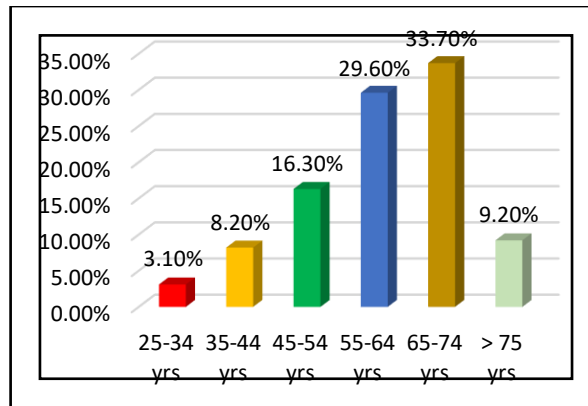


Figure 1. Characteristics Based on Age

Based on the figure 1, most patients with hypertension are aged 65-74 years.

Characteristics by sex

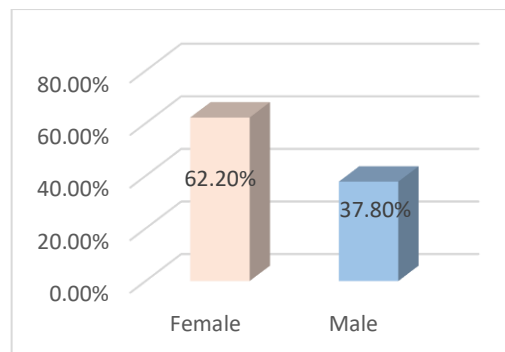
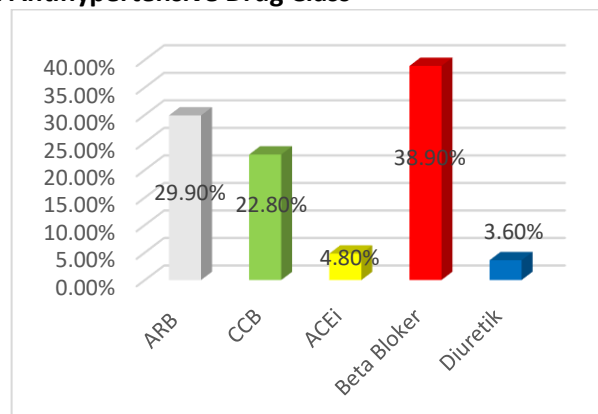


Figure 2. Characteristics Based on Gender

Characteristics based on Antihypertensive Drug Class



Based on the figure 3, the most prescribed drugs were Beta Blocker drugs as much as 38.9%

Figure 3. Class of Antihypertensive

Characteristics based on Dosage of Antihypertensive Drugs

Based on the drug table 1, the most widely used drug was Bisoprolol with a dose of 2.5 mg with a percentage of 26.9%.

Table 1:Dosage of Antihypertensive Drugs

	Drug	Dosage	Percentage	
1.	Candesartan	16 mg	26,3%	
		8 mg	3,6%	
2.	Amlodipin	10 mg	21%	
		5mg	1,8%	
3.	Lisinopril	10 mg	3%	
		Captopril	25 mg	0,6%
		Ramipril	2,5 mg	1,2%
4.	Bisoprolol	5 mg	12%	
		2,5 mg	26,9%	
5.	Furosemid	40 mg	3,6%	
		TOTAL	100%	

Characteristics based on the rules for using Antihypertensive Drugs

Table 2:Rules for Using Antihypertensive Drugs

NO	Drug	Dosage	Rule of Use	
1.	Candesartan	16 mg	1x1	
		8 mg	1x1	
2.	Amlodipin	10 mg	1x1	
		5mg	1x1	
3.	Lisinopril	10 mg	1x1	
		Captopril	25 mg	1x1
		Ramipril	2,5 mg	1x1
4.	Bisoprolol	5 mg	1x1	
		2,5 mg	1x1	
5.	Furosemid	40 mg	1x1	

Characteristics by Type of Drug Therapy

Based on the figure 4, the combination type is the most with a percentage of 59.2%.

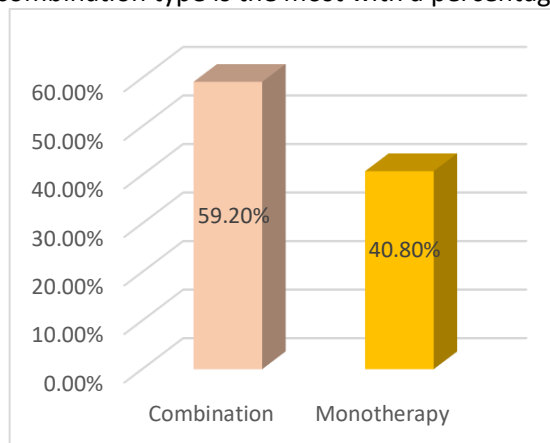


Figure 4. Types of Antihypertensive Drug

Characteristics Based on Blood Pressure Evaluation

Based on the figure 5, the results of controlled blood pressure evaluation as much as 64.3%

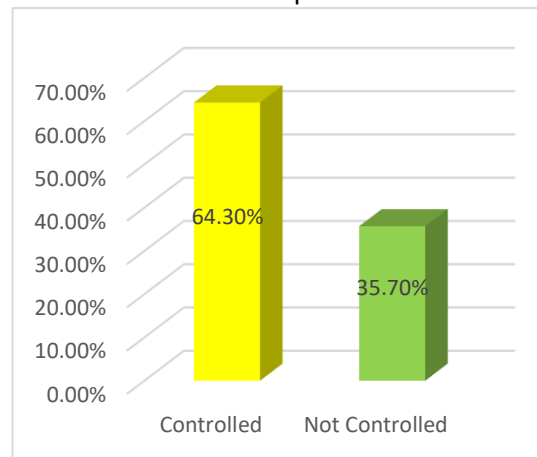


Figure 5. Evaluation of Blood Pressure Outcomes

DISCUSSION

Characteristics by age

The age group of hypertensive patients is mostly in the age group of 65-74 years, this is in line with research conducted by Anita Fiany that the demographic characteristics of hypertensive patients based on age show that there are around 280 patients aged 60-70 years who suffer from hypertension compared to other ages (Finny, 2019).

Age might increase the chance of developing hypertension since ageing can lead to hormonal imbalances and a decline in organ function. With advancing age, the risk of hypertension may rise. This is a result of the body's natural changes that have an impact on how the heart and blood arteries function (Ernawati et al., 2022).

The findings of this study are also consistent with a study by Dagmar et al., which found that older age groups > 60 years are the age groups who suffer from hypertension the most, with a total of 48 patients or 44%. One of the degenerative diseases brought on by the combination of a person's different risk factors is hypertension. The age factor is one of the elements that cannot be modified. Blood pressure will rise as you age, and as a result, the prevalence of hypertension will rise as well. Large arteries are affected by this ageing process, which results in increased stiffness and a rise in systolic blood pressure and a decrease in diastolic blood pressure. This rise in blood pressure is brought on by a buildup of collagen in the muscle layer that thickens the artery walls, causing the blood vessels to gradually constrict and stiffen. Up to the age of 70, the reduced flexibility of the big blood arteries will also cause a rise in systolic blood pressure, while an increase in diastolic blood pressure will occur between the ages of 50 and 60, after which it will stabilise or even start to fall.(Dagmar et al., 2021)

Gender characteristics

The majority (63%) of hypertensive patients are female. According to Tutoli et al.'s study, 59 patients, who made up the biggest sample, were female. The estrogen hormone is one of the causes of this, among others. Women steadily lose estrogen before menopause, and until menopause, when estrogen alters depending on the woman's age, which begins around the age of 45 to 55 years.(Tutoli et al., 2021). The results of this study are also in line with a study conducted by Tandililing et al which stated that based on gender, there were 87 female patients (60%) have hypertension while male patients totaled 58 patients (40%).

Due to the association between hormonal factors, specifically estrogen, which is higher in women than in men, there are more female hypertension patients than male patients. Incidence and risk of hypertension are lower in premenopausal women than in men of the same age, but this

advantage for women gradually fades after menopause because hormonal changes after menopause might raise the risk of degenerative diseases like hypertension. According to studies on how menopause affects blood pressure, postmenopausal women have systolic pressure that is 4-5 mmHg greater than premenopausal women. Blood pressure levels vary across the sexes for a variety of multifactorial causes that are still not fully understood. Blood pressure levels vary across the sexes for a variety of multifactorial causes that are still not fully understood. The renin-angiotensin system, oxidative stress, endothelin, body weight, and sympathetic activation are a few of the theories that have been put forth. When compared to men, the preventive effects of estrogen can help women postpone the onset of cardiovascular disease by 10 to 15 years. After menopause, endothelin levels rise along with oxidative stress, which can have an impact on blood pressure by increasing sodium absorption and vasoconstriction(Tandililing et al., 2017).

Characteristics of Antihypertensive Drug Classes

Beta-blockers are a class of drugs that are commonly used; they have a negative chronotropic and inotropic impact that lowers blood pressure and may also lower cardiac output and peripheral vascular resistance(Nurmalita, at al 2019). Beta-blockers work by attaching to B1 receptors, which boosts cardiac automaticity and conduction speed. Renin is released as a result of B1 receptor stimulation, raising blood pressure. Contrarily, binding to B2 receptors results in increased metabolic consequences and smooth muscle relaxation. The heart experiences inhibition as a result of the beta-blocker's binding to B1 and B2 receptors, which causes the heart rate to decrease. Beta-blockers also lower blood pressure through reducing renin and cardiac output, among other methods (Khairunnisa I, 2020)

Dosage Characteristics of Antihypertensive Drugs

Drug dosages that are frequently used include 2.5 mg of the second-generation beta blocker Bisoprolol, which has a percentage of 26.9% and specifically antagonises 1 receptors (cardioselective). By preventing sympathetic nerves from sending messages (neurotransmitters) to the heart, bisoprolol reduces heart rate. In order to lower blood pressure in the blood arteries and make it easier for the heart to pump blood throughout the body, this is accomplished by inhibiting beta-adrenergic receptors. As a result, the heart beats more slowly. Patients with stable conditions, defined by the lack of fluid overflow (edoema), are administered bisoprolol. Typically, bisoprolol is administered alongside to an ACE inhibitor or diuretic, starting at a low dose of 1.25 mg per day and gradually increasing to the target dose of 10 mg per day over the course of a few weeks(Saiful, 2014).

Characteristics Rules for the Use of Antihypertensive Drugs

Antihypertensive drugs are often used once a day. Most of the doses of antihypertensive drugs and the frequency are by the usual standard dosage references from the consensus management of hypertension, where almost all drugs are taken once a day, unlike the rules for using drugs in general, which must be taken 3 times a day. However, the choice of dose that is different from the literature is the frequency of captopril dosage regimens where patients receive captopril therapy 25 mg once a day. However, Kemenkes RI stated Captopril is given 12.5 to 25 mg, 2 to 3 times daily (Kemenkes RI, 2020). Captopril has a short duration of action, so it must be used 2 to 3 times a day to reduce blood pressure for 24 hours, but on prescriptions, captopril is not used as a single drug but in combination with other antihypertensive drugs so that it is not given 2 or 3 times a day but once a day

Characteristics by Type of Drug Therapy

The results of this study did not correspond with those of Ard hany et al., who found that the most frequently prescribed antihypertensive medication was administered as single or monotherapy with a percentage of 72% with amlodipine drug items, while the combination was 28%. The most common

type of therapy was the combination type, accounting for as much as 60% of cases (Ardhany et al., 2018)

Current hypertension management recommendations advise using combination medication therapy to lower blood pressure in the majority of individuals. To improve patient adherence to therapy, it may be administered as a single tablet combination if it is widely available and practical. (PERHI, 2021)

Characteristics of Blood Pressure Evaluation

The percentage of hypertension patients with controlled blood pressure is higher than the percentage of uncontrolled patients (64.3%), indicating that antihypertensive medications are being used effectively to bring blood pressure in hypertensive patients down to the target level, which is less than 140/90 mmHg. This study contradicts that of Ernawati et al., who found that a large number of hypertension patients still had uncontrolled blood pressure after collecting blood pressure data during visits to the puskesmas. Numerous factors, such as the patient's health (age, sex, heredity, or genetics), obesity, smoking, stress, inactivity, and excessive salt consumption, can contribute to uncontrolled blood pressure (Ernawati et al., 2022).

Disobedience of hypertensive patients with poor treatment is one of which can cause blood pressure to become uncontrolled which will have an impact on the emergence of various complications.(Nurmainah et al., 2014). Several factors cause disobedience, including internal patient factors, disease conditions, therapeutic factors, and external factors which include health care system and economic factors.(Pujasari et al., 2015).

Disobedience is a prevalent issue in the management of chronic illnesses like hypertension that call for long-term care. Antihypertensive medications now on the market help hypertensive individuals manage their blood pressure and significantly lower their chance of developing cardiovascular issues. However, if antihypertensive medication is not taken consistently, it has been shown that utilising antihypertensives alone is insufficient to generate long-term blood pressure management results. Support from patients, medical professionals, and families is necessary to provide hypertension sufferers with the best possible care. The family has a significant impact on the patient's attitudes and the appropriate course of therapy for those with hypertension. (Ajeng et al, 2015).

The limitations of this research were the collected data was from one hospital instead of several, the data was incomplete, errors in putting medical records, the researcher's abilities, and limited research time.

CONCLUSION

Patients with hypertension suffer the most from patients aged 65-74 years. Gender is female. Antihypertensive drug group. Beta-blockers are often used, namely Bisoprolol, a dose of 2.5 mg in tablet preparation, which is used in combination with other antihypertensive drugs. In hypertensive patients, 64.3% of hypertension is controlled. The results of this research are hoped could be used as a source of information and as useful input at the Ibnu Sina Gresik Regional Hospital in particular, and can be used as a reference for improving the quality and quality of treatment for hypertension sufferers. In addition, this research is very important for public health and individual well-being, developing effective treatments, and implementing preventive measures to reduce the impact of complications from hypertension.

CONFLICT OF INTEREST

All authors declare that there is no conflict of interest in this study

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