JPPIPA 10(9) (2024)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Evaluation of The Rationality of Hypertension Medication Use in Puskesmas Central Cimahi

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Received: March 12, 2024
Revised: July 29, 2024
Accepted: September 25, 2024
Published: September 30, 2024

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DOI: 10.29303/jppipa.v10i9.8673

Abstract: A persistent and abnormal increase in blood pressure in the arteries is known as hypertension (HT. This research aims to assess the consumption of antihypertension at the Puskesmas Central Cimahi. Non-analytical descriptive methods were used in this investigation. Retrospective data was collected by accessing patient prescriptions and medical record data. Fifty-six patient samples in this study met the inclusion requirements. Quantitative and qualitative methods are used to evaluate rationality. Quantitative data analysis is processed to determine the number of patients, gender, age, and type of drug classification. Qualitative data analysis is processed to evaluate the appropiate of the indication, drug, patient and dose. Based on the research results, 52 people suffered from stage 1 hypertension, and four patients suffered from stage 2 hypertension. Amlodipine monotherapy was the most frequently prescribed drug, namely 92%. While the combination of amlodipine, captropil, amlodipine, and hydrochlorothiazide amounted to 4%. The rationality of treating hypertensive patients who meet the right indications, the right drug, the right patient and the right dose is 100%. It can be concluded that the evaluation and use of hypertension medication at the Puskesmas Central Cimahi as a whole meets the criteria for rational treatment.

Keywords: Antihypertension; Hypertension; Rational use of drugs

Introduction

Hypertension is a condition where the systolic blood pressure in a person's body is more than or equal to 140 mmHg and/or diastolic blood pressure is more than 90 mmHg (Ansar, 2019; Mancia et al., 2007; Wulandari et al., 2023). Every year, the number of hypertension sufferers in the world increases. An estimated 9.4 million deaths worldwide are caused by complications and hypertension each year (Septiyawati et al., 2021; Wardani et al., 2021; Zheng et al., 2022). Sixty-five million forty-eight thousand one hundred ten people in Indonesia suffered from hypertension in 2013 (the prevalence of hypertension in this country is 25.8%). In percentage terms, West Java Province is in fourth place, namely 29.4% (Khasanah, 2022; Kurnianto et al., 2020; Mahwati, 2019; Rahma et al., 2024). If hypertension is not given attention, it can lead to various complicated diseases (Abidin, 2019; Hanna, 2024).

Along with improvements in cases of hypertension and the complications that can occur if hypertension is not treated appropriately, the Rational use of drugs in hypertensive patients is one of the essential elements in achieving quality health and medical care for patients (Irianti et al., 2021; Purwono et al., 2020). Puskesmas is one of the Indonesian people's front lines of service health. It should implement appropriate rational use of medication existing standards (Febrinasari et al., 2021; Soegiantoro et al., 2022). Inappropriate medication use at the community health center level can have detrimental consequences for broad circles of society (Cateau et al., 2020; Untari et al., 2018; Viana et al., 2022). Many lower middle-class people, who constitute the majority of the Indonesian population, vote for health services at Puskesmas, so it is necessary to evaluate the

How to Cite:
Hermanto, F., Choirunissa, A., Sutarna, T. H., Amelia, R., & Rizwan, A. (2024). Evaluation of The Rationality of Hypertension Medication Use in Puskesmas Central Cimahi. *Jurnal Penelitian Pendidikan IPA*, *10*(9), 6977–6983. https://doi.org/10.29303/jppipa.v10i9.8673

rationality of drug use carried out in antihypertension in hypertensive patients at Puskesmas Central Cimahi. According to Riskesdas, Bekasi City has a greater prevalence of hypertension sufferers in West Java Province at 29.2%, compared to Bandung City at 21.8% (Riskesdas, 2018). With an incidence of 2,886 cases, hypertension is ranked first among the ten most common diseases at the Puskesmas Central Cimahi in 2021. Therefore, this research was conducted to determine usage patterns and rationality. The use of antihypertensive drugs includes accuracy indications, dosage, time of drug administration, and method of drug administration in hypertensive patients.

Method

The research is observational, using a cross-sectional descriptive analysis design. Data was collected retrospectively, namely by collecting data from 56 medical records and prescription outpatients at the Puskesmas Central Cimahi period from July to December 2022. Of the 604 medical record data, 56 where medical record data met the inclusion criteria. The remaining medical records contained incomplete and illegible information. Inclusion criteria included patient medical records and prescriptions. Those diagnosed with hypertension are aged 18-65 years and undergoing outpatient treatment at the Puskesmas Central Cimahi. Exclusion criteria included medical records and prescriptions incomplete or damaged, as well as hypertensive patients who have complications. Sampling has been established using a purposive sampling technique, namely determining the sample based on the inclusion criteria. Data analysis in this study used quantitative and qualitative methods, which were used to evaluate rationality (Sugiyono, 2016). Data analysis from quantitative was processed to determine the number of patients, gender, age, and type of drug classification. Meanwhile, qualitative data analysis was processed to evaluate the suitability of indications, drugs, patients, and doses.

Result and Discussion

Respondent Characteristics

In this study, research characteristics were analyzed based on gender because gender differences also influence research analysis, so it is necessary to analyze trends between women and men. The number of patients by gender is shown in Table 1. Patient characteristics based on age are shown in Figure 1. while the hypertension category is shown in Table 2.

Table 1. Characteristics of Hypertensive Patients Based on Gender

Gender	Number of patients	Percentage (%)
Man	15	2
Woman	41	7
Total	56	100

From the research results, it was found that the majority of hypertensive patients were 41 women (73%) and 15 (27%) male patients. The most common characteristics of hypertensive patients based on age are around the age of 56-65 (41%); 92% had stage 1 hypertension; and 2% suffer from hypertension stage 2.

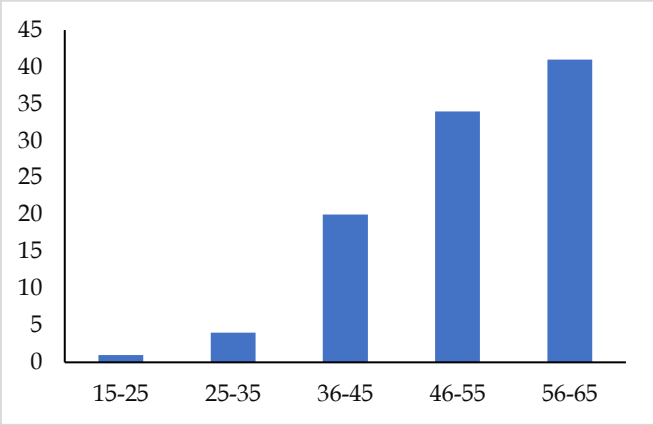

Figure 1. Characteristics of Hypertensive Patients Based on Age Range

Table 2. Characteristics of Hypertension Categories

Hypertension Category	Amount	Percentage (%)
Stage 1	52	92
Stage 2	4	8%
Total	56	100

Hypertension is more common in women who are old age due to a reduced quantity of hormones estrogen during menopause plays a critical risk factor that can cause hypertension (Abbas et al., 2022; Ghazi et al., 2022; Tasić et al., 2022). Menopause and stress are two factors that can increase blood pressure, which is the cause (Ardiani et al., 2015; Lima et al., 2013). Psychologically, women feel stress more easily than men (Sandanger & Moum, 2004). The hormones norepinephrine and adrenaline can increase in response to stress, narrowing blood vessels and increasing blood pressure (Katanna, 2022; Yulistina et al., 2017). The prevalence of hypertension rises with advancing age (Dai et al., 2022; Goodwin, 2003; Muli et al., 2020). Among individuals aged 60 and above, approximately 50 to 60% exhibit blood pressure readings of 140/90 mmHg or higher. This phenomenon results from the degenerative changes typically accompanying aging (Yunus et al., 2021).

Antihypertensive Use

In general, drugs used for therapy hypertension consist of eight classes of drugs antihypertensives, and several types of each group of drugs differ in terms of their pharmacological properties. Antihypertensives commonly used at the Puskesmas Central Cimahi include the diuretic group, angiotensin-converting enzyme Inhibitors (ACEI), and Calcium Channel Blockers (CCB). Based on data on the use of antihypertensive drugs in Table 3, it was found that respondents with hypertension who were treated at the Puskesmas Cimahi Center for the period from July to December 2022, mainly used drugs from the calcium channel blocker group, namely 98%. The administration of Calcium Channel Blockers induces relaxation in both the heart and smooth muscles by inhibiting voltage-sensitive calcium channels, which, in turn, decreases the influx of extracellular calcium into the cells (Fu et al., 2021). The incidence of hypertension is based on the type of regimen at the Puskesmas Central Cimahi. For the period July to December 2022, respondents were hypertensive patients who received single treatment, 92% of whereas combination treatment 4% (Table 3).

Table 3. Characteristics of Types and Classification of Drugs

Treatment category	Drug class	Example	Amount	Percentage (%)
Single	Calcium Chanel Bloker (CCB)	Amlodipine	52	92
Combination	Calcium Channel Blocker (CCB) + ACE inhibitor	Amlodipine + Captopril	2	4
	Calcium Channel Blocker (CCB) + Thiazide Diuretic	Amlodipine + Hydrochlorthiazide	2	4
Total			56	100

Based on the Joint National Committee (JNC) guideline 7, the use of a single antihypertensive drug is generally given to patients with hypertension stage 1. On the other hand, the use of combination antihypertensives is generally given to patients with hypertension stage 2. Use of therapy using a combination of two antihypertensive drugs is recommended for patients who have very high blood pressure, i.e., values blood pressure that is far from the target pressure value blood as it should be when blood pressure is more than 20/10 mmHg above the target blood pressure, should Consider providing two classes of therapy drug (Chobanian et al., 2003; Schwartz & Sheps, 1999).

Evaluation of the Rationality of Hypertension

Evaluate the rationale for using antihypertensive drugs conducted on 56 patients' medical record data suffering from hypertension on an outpatient basis at the Puskesmas Central Cimahi. The rationality evaluation includes several criteria: appropriate indication, appropriate medication, right patient, and right dose (Kemenkes, 2011). The correct indication is the appropriateness of administering the drug between indications with a doctor's diagnosis. The choice of a drug refers to establishing the diagnosis. According to JNC guidelines 7, the use of antihypertensive drugs, if measured from Blood pressure, can be seen in the treatment algorithm hypertension is when the systolic blood pressure is 140-159 mmHg or diastolic blood pressure 90-99 mmHg then needs to be given antihypertensive monotherapy, and if systolic blood pressure ≥160 mmHg or blood pressure diastolic ≥100 mmHg needs to be given a combination of 2 kind of medicine.

Appropriate indication

Evaluate the appropriate indication to see whether patients must be given antihypertensive drugs based on blood pressure. Our findings show that all respondents with hypertension at the Puskesmas Central Cimahi from July to December 2022 have met the appropriate indication criteria of 100%. The appropriateness of therapy selection is a process of assessment The selection of drugs according to the patient's needs is adjusted according to the number of patient visits and disease patterns, formulary, and standard books diagnosis and therapy. The accuracy of indications reaching 100% in treating hypertensive patients can be caused by health workers at the Cimahi Community Health Center correctly carrying out standard operating procedures (SOP) at the Puskesmas and following the formulary.

Appropriate medication

Appropriate medication is the suitability of medication administration antihypertensives that can be weighed from the accuracy class of therapy line, type, and combination of drugs for the patient's hypertension. From the evaluation results, the accuracy of the medication given to hypertensive patients at the Puskesmas Central Cimahi was 100% (Table 5), and the antihypertensive medication given followed the standard JNC 7.

Table 4. Rationale for Hypertension Treatment at Puskesmas Central Cimahi Based on Appropriate Indication Criteria

Diagnosis	Prescription at the Puskesmas Central Cimahi	Guidelines according to JNC 7 (Chobanian et al., 2003)	Percentage Rationality (%)
Hypertension stage 1 Hypertension stage 2	1. Amlodipine 2. Captopril 3. Hydrochlorothiazide 4. Amlodipine + Captopril 5. Amlodipine + Hydrochlorthiazide	1. Amlodipine 2. Captopril 3. Hydrochlorothiazide + Captopril 4. Hydrochlorothiazide + Amlodipine 5. Captopril + Amlodipine 6. Furosemide + Amlodipine 7. Captopril + Spironolactone + Amlodipine	100

Table 5. Rationale for Hypertension Treatment at Puskesmas Central Cimahi Based on Appropriate Medication Criteria

Diagnosis	Prescription at the Puskesmas Central Cimahi	Guidelines according to JNC 7 (Chobanian et al., 2003)	Appropriate medication (%)	
			Yes	No
Hypertension stage 1 (n=52)	1. Amlodipine 2. Captopril 3. Hydrochlorthiazide	Amlodipine/Captopril/Hydrochlorothiazide	52 (100)	
Hypertension stage 2 (n=4)	1. Amlodipine + Captopril 2. Amlodipine + Hydrochlorthiazide	1. Hydrochlorothiazide + Captopril 2. Hydrochlorothiazide + Amlodipine 3. Captopril + Amlodipine 4. Furosemide + Amlodipine 5. Captopril + Spironolactone + Amlodipine	4 (100)	

Appropriate patient

The right choice for the patient is the suitability of the drug selection considering the patient's condition so that there are no contraindications to the patient's individual. Evaluate patient's appropriateness of antihypertensives by comparing contraindicated drugs given conditions to the patient according to the doctor's diagnosis. This study values drug use based on appropriate patients scored 100% (Table 6) because all drugs were prescribed to hypertensive respondents at the Puskesmas Central Cimahi in 2022 according to the pathological condition and patient physiology according to information in the medical record.

Table 6. Rationale for Hypertension Treatment at Puskesmas Central Cimahi Based on Appropriate Patient Criteria

Drugs	Contraindication	Appropriate Patient	Percentage Rationality (%)
Amlodipine	Congestive	52	100
Amlodipine + Captopril	Pregnancy, hyperkalemia, arterial stenosis, bilateral renal failure, congestive	2	100
Amlodipine + Hydrochlorthiazide	Gout, congestive	2	100

Table 7. Rationale for Hypertension Treatment at Puskesmas Central Cimahi Based on Appropriate Dose Criteria

Prescription at the Puskesmas Central Cimahi	Guidelines according to JNC 7 (Chobanian et al., 2003)	Appropriate dose	Percentage Rationality (%)
Amlodipine 5-20 mg/day	Amlodipin 2,5-10 mg/hari	92	100
Captopril 25-50 mg/day	Captopril 25-50 mg/hari	2	100
Hydrochlorothiazide 12.5 mg/day	Hidroklorotiazid 12,5-50 mg/hari	2	100

Appropriate dose

The appropriate dose is the appropriateness of administering the drug dose antihypertensives with a range of therapeutic doses, reviewed from the dosage used per day is based on the condition patient specific. When prescribing antihypertensive drugs in the range of minimum dose and dose per day recommended, the prescription is said to be the correct dose. It is said that the dose is insufficient or the dose is too low if the dose received by the patient is below the range of therapeutic

doses that the patient should receive. The study results showed that the drugs given to patients showed a dose compliance of 100% (Table 6).

Limitation of the Study

In this study, there is a limitation that no information is available regarding patient's condition based on supporting examinations, so the patient is considered to have no contraindications with antihypertensives.

Conclusion

Based on the results of research conducted at the Puskesmas Central Cimahi regarding the evaluation of the rationalization of the use of hypertension drugs for the period from July to December 2022, it can be concluded that it meets the criteria for rational drug use, namely the right indication, the right drug, the right patient, and the right dose.

Acknowledgment

The researcher would like to thank the Cimahi City Health Service and the Puskesmas Central Cimahi for providing the opportunity to conduct research and collect research data.

Author Contributions

The authors of this paper was facilitated by the guidance of two supervisors.

Funding

No funding was received for conducting this study.

Conflicts of Interest

The authors declare no conflict of interest.

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