

# Profile of Usage Antihypertensive Drugs for Outpatient with Hypertension in Community Health Center

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**Abstract**—Hypertension is a non-communicable disease that is the most important health problem due to its high prevalence. This study aims to study the profile of antihypertensive drug use in outpatients at community health centre X, in Padang City, West Sumatra, Indonesia. This study was observational using a descriptive analysis design. A retrospective study, data were collected from medical record sheets of hypertensive patients from January to December 2021. The population was 6691 patients, and random sampling using the Solvin's formula and the number of samples to be taken is 98 medical records. Sampling using the PickMe!! application, that is every month 9 medical records (January, February) and 8 medical records (March-December) are taken. The results showed that at the X community health center, most patients suffered from grade 2 hypertension with a percentage of 51.0% with the most sustained comorbidities being Diabetes mellitus with a rate of 40.5%. The type of therapy most often used is monotherapy with a percentage of 77.6% using amlodipine, and the most combination antihypertensive is amlodipine with captopril.

**Keywords**—Hypertension; health center; amlodipine; captopril

## I. INTRODUCTION

Hypertension is a non-communicable disease that is the most important health problem due to its high prevalence. Hypertension is the third largest risk factor for premature death. The World Health Organization (2019) reported the highest incidence of hypertension in Africa at 27% and Southeast Asia in third place with a prevalence of 25% of the total population (1). The prevalence of hypertension in Indonesia is 34.1%. Based on the prevalence of hypertension from the results of measurements in the population aged  $\geq 18$  years where the highest in South Kalimantan (44.1%), while the lowest in Papua amounted to (22.2%).

In West Sumatra Indonesia, hypertension is included in the top 5 diseases suffered by the people of West Sumatra. Meanwhile, in Padang, the provincial capital, hypertension ranks 3rd out of 10 causes of death. Hypertension occurs due to an increase in systolic blood pressure  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg as mentioned in The Seventh Report of The Joint National Committee on Prevention Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) (3). First-line treatment for patients with hypertension depends on the degree of blood pressure elevation and the presence of a strong indication for the selected drug. Angiotensin Converting Enzyme (ACE) inhibitors, Angiotensin II Receptor Blockers (ARBs), Calcium Channel Blockers (CCBs), and thiazide diuretics are first-line options. Beta-blockers treat certain strong indications or as combination therapy with first-line antihypertensive agents for patients without indications (4). Therapeutic management in hypertensive patients aims to reduce mortality and morbidity

associated with hypertension. These mortality and morbidity are associated with target organ damage (e.g. cardiovascular or cerebrovascular events, heart failure, and renal disease), reducing and controlling blood pressure is the main goal of hypertension therapy (3).

According to research conducted by Asri in 2022, the percentage based on the highest age criteria was obtained at the age of  $>55$  as many as 53 people (53%). The highest gender criteria are female with a percentage of 67%. The highest percentage of blood pressure was obtained, namely in stage 1 hypertension as much as 67%. The type of hypertension drug in use with the highest hypertension drug is amlodipine as much as 70%. (5)

Community health centre is a functional organizational unit that directly provides comprehensive services to the community, as the first level of health services, health services presented by community health centre are basic health services, which are needed by the community. When viewed from the health care system that applies in Indonesia, the health center is the backbone and should apply the rational use of drugs according to existing standards (6).

## II. RESEARCH METHODS

The study conducted from October to December 2022 in the medical record room of community health centre X, Padang City, West Sumatra Indonesia 25176. The type of research conducted was observational using a non-experimental descriptive analysis design. Data collection was carried out retrospectively, from the medical record sheets of hypertensive patients from January to December 2021 in community health centre X in Padang City.

The population in this study were all medical records of

hypertensive patients from January to December 2021 period, namely 6691 patients. The medical records selected were medical records that met the inclusion criteria, namely patients who received hypertension medication and were over 18 years old. The sampling method used in this study was random sampling using the PickMe! application. The total population in this study was 6691, the Solvin's formula was used to determine the sample size, which was 98 medical records. Of the 98 medical records, random sampling was carried out using the PickMe! application, where each month 9 medical records were taken (January and February) and 8 medical records (March to December)

III. RESULT AND DISCUSSION

Result of the study find 98 patients with hypertension met the inclusion criteria. Blood pressure data is presented in Table 1.

TABLE 1. Hypertension level profile of patients

Degrees	Patients	Percentage (%)
Normal	6	6.1
Pre-Hypertension	8	8.2
Grade 1 hypertension	34	34.7
Grade 2 hypertension	50	51.0
Total	98	100.0

Based on the data in Table 1, it was found that blood pressure in hypertensive patients at community health centre X was prehypertension in as many as 8 patients (8.2%), grade 1 hypertension in as many as 34 patients (34.7%), and grade 2 hypertension as many as 50 patients (51.0). From these data, the most common degree of hypertension at community health centre X is grade 2 hypertension in as many as 50 patients (51.0). This is not in line with research conducted by Asri (2022) where it was found that the percentage of degrees of hypertension was in grade 1 hypertension as much as 67% (5). Hypertension degree 2 obtained the highest percentage because of many influencing factors such as genetics, environment, and hyperactivity of the sympathetic nervous system. Complicating diseases such as cholesterol and diabetes mellitus. Adopting a healthy lifestyle is very important for everyone to prevent high blood pressure and is an important part of treating hypertension.

Comorbidities

TABLE 2. Comorbidities of Hypertension Patients

Comorbidities	Patients	Percentage (%)
Dermatitis	3	8.1
Diabetes Mellitus	15	40.5
Dyspepsia	4	10.8
Gastritis	2	5.4
Hyperlipidemia	2	5.4
Myalgia	2	5.4
Osteoarthritis	8	21.6
Vertigo	1	2.7
Total	37	100.0

In Table 2, it is known that the comorbidities that many patients suffer from are diabetes mellitus (DM) as many as 15 cases (40.5%). Diabetes mellitus is one of the risk factors for hypertension. In diabetic patients, metabolic changes occur,

namely hyperglycemia and excess free fatty acid production which can cause a decrease in the availability of Nitric Oxide (NO) produced by the endothelium of blood vessels. NO is a chemical molecule that can modulate vascular muscle to cause vasodilation. If vascular endothelial function is impaired, production will be reduced so that it will trigger vasoconstriction (Creager, 2003) (7). These results are in line with research conducted by Sa'idah (2018) where the disease that many patients suffer from is diabetes mellitus (DM) where as many as 20 cases (40.0%). Diabetes mellitus is one of the risk factors for hypertension (8).

Hypertension Medication Profile

Data on drugs used by patients consisted of single drugs and combinations of hypertension drugs. The complete results are listed in Table 3.

TABLE 3. Usage of Antihypertensive Drugs at community health centre X

Hypertension Therapy	Patients	Percentage (%)
Amlodipine	64	65.3
Captopril	8	8.2
HCT	4	4.1
Furosemide	1	1.0
Amlodipine + Captopril	11	11.2
Amlodipine + HCT	5	5.1
Captopril + HCT	3	3.1
Amlodipine + Captopril + HCT	2	2.0
Total	98	100.0

The type of antihypertensive therapy used in hypertensive patients is shown in Table 3 the most widely used drug is antihypertensive drug monotherapy (77.6%) and the most common drug used is amlodipine drug monotherapy (65.3%). The most common combination therapy of 2 drugs is amlodipine + captopril (11.2%). Another study also stated that the most common type of antihypertensive therapy was 59.1% monotherapy and 40.9% combination therapy (9)

The most common monotherapy treatment is amlodipine. This drug causes relaxation of the heart muscle by inhibiting calcium entry in the blood vessels where calcium is needed for muscle contraction. In smooth muscle, when the calcium channel is inhibited, it will cause a decrease in calcium inflow resulting in weakened tone and relaxation of vascular smooth muscle. This relaxation is a form of vasodilation so that blood pressure can decrease (10). Based on a review by Pascual (2000), it is known that the CCB class, including Amlodipine, has advantages and is well tolerated by geriatric patients, whereas in this study the dominant research sample was patients aged > 60 years but still needs to monitor side effects (11). Amlodipine tends to have lower vasodilatory side effects than other drugs from the CCB class (12). This class has almost the same effectiveness as ACEI which is widely used as the first line of hypertension treatment. This ARB group is widely chosen compared to ACEI because it avoids the side effects of the ACEI group, namely dry cough that does not go away in long-term use. This is because ARBs unlike ACEI inhibit the angiotensin-converting enzyme so there is no inhibition of bradykinin degradation and bradykinin remains an inactive metabolite. This is why ARBs do not cause dry cough side effects (10).

As for combination therapy, the meta-analysis journal stated that the combination of ACEI/ARB with CCB is more favorable than other antihypertensive drug combinations by showing lower results in cardiovascular events and adverse side effects (13). This statement is also reinforced by Syamsudin in 2011 (14) which states that the combination of CCB and ACEI/ARB shows a renal protective effect and triggers a reduction in left ventricular mass so that the use of these two drugs is beneficial for DM patients or patients with kidney disease. The high use of the CCB + ACEI/ARB combination is appropriate with the number of respondents in this study where the comorbidities that many patients suffer from are DM so this combination is the main choice in treatment. These results are also by research by Florensia (2016) on the use of antihypertensive drugs in the inpatient installation of the Tangerang City Regional General Hospital in 2015 where the highest use of a combination of 2 antihypertensive drugs was among the CCB + ACEI group (25%). (15)

#### IV. CONCLUSION

It can be concluded that at the X community health center, most patients suffer from grade 2 hypertension with a percentage of 51.0% with the most common comorbidity being Diabetes mellitus with a percentage of 40.5%. The type of therapy most often used is monotherapy with a percentage of 77.6% using amlodipine, and the most combination antihypertensive is amlodipine with captopril.

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