

## Rationality Of Prescribing Geriatric Patients With Hypertension Using The 2022 Beers Criteria At Northern City Primary Health Care Center – Kediri

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### ABSTRACT

Overeating, excessive activity, smoking, and lack of sleep are just a few of the lifestyle choices and habits that can lead to heart and blood vessel disease, which can affect many, especially those over 40. The onset of high blood pressure, sometimes known as hypertension, is one of them. Health care institutions, patients, and society are all harmed by irrational prescribing. The American Geriatrics Society Beers Criteria 2022, which was created as a tool of evaluating reasonable prescribing, The purpose of this study is to evaluate the validity of prescription antihypertensive medications to geriatric patients at Northern City Primary Health Care Center Kediri, using the Beers criteria. This study's methodology is cross sectional descriptive observational research. data gathering from the past on the prescriptions given to elderly patients at at Northern City Primary Health Care Center Kediri in the year 2022. Beers Criteria 2022 of the American Geriatrics Society was used to analyze the samples. The study's findings on drug usage based on the Beers criteria for 2022 revealed that 60.67% of older persons may be using drugs that are potentially inappropriate for them, suggesting that there is possible drug use in geriatrics. 5.33% of medications should be used with caution in patients with geriatric hypertension, and none of them are harmful. Drugs may be used inadvertently in geriatric patients because of interactions with underlying illnesses that can make the condition worse (5.33%).

**Keywords:** Beers Criteria, Geriatric, Hypertension

### INTRODUCTION

Modernization has resulted in societal lifestyle changes such as the habit of overeating, excessive activity, excessive smoking, and insufficient sleep. This lifestyle and lifestyle causes various heart and blood vessel disorders, particularly in persons over the age of 40. One of them is the appearance of high blood pressure, sometimes known as hypertension (Astuti, 2017).

Hypertension is defined as an increase in systolic blood pressure greater than 140 mmHg and diastolic blood pressure greater than 90 mmHg. Patients with hypertension have the highest risk of stroke and cardiovascular disease. The main effect of hypertension on the heart is increased afterload, which causes the heart to contract more forcefully, hastening the formation of atherosclerosis or narrowing of the coronary arteries. Left ventricular hypertrophy (increased ventricular wall thickness) and diastolic dysfunction, systolic dysfunction, coronary heart disease, arrhythmias, and cerebrovascular system disease are all manifestations of hypertension in the cardiovascular system. Because hypertension is the leading cause of death and morbidity in Indonesia, it is critical to manage this condition through interventions that can be carried out at various levels of health care facilities in order to lower the prevalence and incidence of cardiocerebrovascular disease. Basic Health Research (Riskesdas) in Indonesia in 2018 revealed a rise in the prevalence of hypertension in a population of roughly 260 million,



specifically 34.1% compared to 25.8% in Riskesdas in 2013. According to data from the Ministry of Health of the Republic of Indonesia, just 0.7% of diagnosed hypertensive patients take antihypertensive medication (Ministry of Health of the Republic of Indonesia, 2021).

In Indonesia, the prevalence of hypertension ranges between 6-15%, with many victims remaining unreachable by health care, particularly in rural regions. Meanwhile, one billion individuals worldwide suffered from hypertension in 2011, with two-thirds of them living in low- and middle-income developing countries. High blood pressure affects more than half of the older population, accounting for more than half of all adults over the age of 60. The prevalence of hypertension is expected to rise further, with an estimated 29% of individuals globally suffering from hypertension by 2025. (Republic of Indonesia, Ministry of Health, 2019)

Although the etiology of hypertension is unknown, various risk factors for high blood pressure have been identified, including elderly age and a family history of high blood pressure. Aside from that, there are other variables that might contribute to high blood pressure, such as being overweight followed by a lack of exercise and eating fatty and salty foods. Many studies demonstrate that hypertension medication is important in the elderly, as it reduces morbidity and death from cardiovascular and cerebrovascular illnesses. Blood pressure should be examined carefully in the elderly before therapy is administered. Because of significant blood vessel stiffness, some elderly adults exhibit pseudohypertension (falsely high spigmanometer readings). White coat hypertension is common, especially in women, and systolic blood pressure fluctuates substantially (Astuti, 2017).

Food has an effect on blood pressure stability, either directly or indirectly. The intake of nutrients such as fat and sodium is linked to the development of hypertension. Implementing a regular diet can help to normalize hypertension by eliminating salty and fatty meals, increasing fiber intake, and engaging in physical activity. Geriatric age is also particularly prone to pharmacological side effects since the morphology and physiology of the body's organs have deteriorated in function. They frequently have comorbidities. With the existence of comorbidities, geriatric patients will receive multiple forms of therapy in one prescription (polypharmacy), which might influence the physiological response to therapy compliance (Utami, 2020).

One of the health centers in Kediri City that takes hypertension patients is at Northern City Primary Health Care Center Kediri. Hypertension is one of the ten most prevalent ailments treated at Northern City Primary Health Care Center Kediri. In 2022, there will be 3,262 visits from hypertensive patients out of a total of 30,074 visits. The antihypertensive therapy offered to older people varies.

Based on the description above, researchers are interested in conducting research on the rationality of prescribing for geriatric patients with hypertension using the Beers 2022 criteria at Northern City Primary Health Care Center Kediri.

## **METHODS**

This study is non-experimental and takes a descriptive approach. Retrospective data collection using prescribing data for geriatric hypertensive patients at Northern City Primary Health Care Center Kediri. The information gathered came in the form of pharmaceutical prescription records for senior patients with hypertension. The data was processed using a descriptive design, which is research that tries to characterize the events discovered.

## RESULTS AND DISCUSSION

Table IV.1 Patient Demographic Data Based on Medication Use

No.	Types of Therapy	Group	Generic name	Amount	Percentage
1.	Monotherapy	CCB	Amlodipin	106	70.67
		Diuretik	Furosemid	-	-
		ACEI	Captopril	10	6.67
2.	Combination 2 drug	ACEI	Captopril	-	-
		Diuretik	Furosemid	-	-
			Captopril Hidroclortiazid	-	-
		CCB	Amlodipin	7	4.67
			Furosemid	-	-
		Diuretik	Amlodipin Hidroclortiazid	12	8.00
		CCB	Diltiazem	-	-
		CCB	Amlodipin	-	-
3.	Combination 3 Drug	CCB	Amlodipin	9	6.00
		ACEI	Captopril	-	-
			Amlodipin, Lisinopril	5	3.33
		ACE	Lisinopril, Hidroclortiazid	1	0.67
		Diuretik CCB	Amlodipin	-	-
		CCB	-	-	-
		Total			150

Table IV.4 shows that the Calcium Chanel Blockers (CCB) class of medications is the most commonly used antihypertensive drug prescription at Northern City Primary Health Care Center Kediri for elderly patients, whether used alone or in combination with other classes of drugs. Amlodipine was the most commonly used medicine in 116 patients (99.33%), followed by a combination of amlodipine and diuretics (HCT / Furosemide) in 19 patients (12.67%), and a combination of CCB (Amlodipine) and ACE inhibitor (Captopril / Lisinopril) in 14 patients (9.33%).

### A. Rationality of drug use in geriatrics

#### 1. Criterion I

Table IV.2 Beers I Criteria 2022 for Potentially Inappropriate Medication Use in Older Adults at Northern City Primary Health Care Center Kediri

Name / Type of Medicine	Frequency	Percentage
Chlorfeniramin	31	20,67
Amitriptilin	1	0,67
Sulfonilurea (Glimepiride)	40	26,67
NSAID (Na Diklofenak, Piroxicam, Ibuprofen)	19	12,67
Total	91	60,67

According to research on antihypertensive drug prescribing based on Category I of the Beers 2022 criteria, there are four types of drugs used in prescribing, with recommendations to avoid the use of potentially inappropriate drugs in geriatric patients with Geriatric Hypertension at Northern City Primary Health Care Center Kediri.

## 2. Criterion II

Table IV.3 2022 Beers II Criteria for Potentially Inappropriate Medication Use in Older Adults Due to Drug-Disease or Drug-Syndrome Interactions that May Worsen the Disease or Syndrome at Northern City Primary Health Care Center Kediri

Name / Type of Medicine	Frequency	Percentage
-	-	-

According to Beers 2022 criteria, there was no potentially inappropriate drug usage in older persons at Northern City Primary Health Care Center Kediri, due to drug-disease interactions or syndromic drugs that could worsen the disease or syndrome.

## 3. Criterion III

Table IV.4 2022 Beers Criteria III for the American Geriatrics Society 2022® for Potentially Inappropriate Medications: Medications Used with Caution at Northern City Primary Health Care Center Kediri

Name / Type of Medicine	Frequency	Percentage
Diuretik (Furosemide)	8	5,33
Total	8	5,33

According to research on antihypertensive drug prescribing, as seen from Category III of the Beers 2022 criteria, there is 1 type of drug used in prescribing with recommendations for careful use in Geriatric Hypertension Patients at Northern City Primary Health Care Center Kediri.

## 4. Criterion IV

Table IV.5 2022 Beers IV Criteria for Potentially Clinically Important Drug Interactions to Avoid in Older Adults at Northern City Primary Health Care Center Kediri

Name / Type of Medicine	Frequency	Percentage
-	-	-

Based on category 4 of the Beers 2022 criteria, at Northern City Primary Health Care Center Kediri, no potentially clinically relevant substances that should be avoided were detected in older persons.

## Criterion V

Table IV.6 V Beers 2022 Criteria for Drugs to Avoid or Reduce Doses with Various Levels of Kidney Function in Older Adults at Northern City Primary Health Care Center Kediri

Name / Type of Medicine	Frequency	Percentage
-	-	-

Based on research on antihypertensive drug prescriptions seen from Category V of the Beers 2022 criteria, it was discovered that the use of drugs should not be avoided or the dose should be reduced in geriatric patients at Northern City Primary Health Care Center Kediri with various levels of kidney function.

Table IV.7 shows the findings of a study on prescription antihypertensive medicines to senior patients at Northern City Primary Health Care Center Kediri.

Name / Type of Medicine	Reasons for the Beers criteria 2022	Recommendation	Reason for use
Chlorfeniramin	Highly anticholinergic, risk of confusion	Avoid	To overcome disturbances in rest time in geriatric patients
Amitriptilin	Highly anticholinergic, sedative and causes orthostatic hypotension/low blood pressure conditions	Avoid	Given to patients with nerve/back disorders and there are indications of migraine disorders
Sulfonilurea (Glimepiride)	Risk of cardiovascular disease and hypoglycemia	Avoid	Maintain blood sugar levels by providing information on the most appropriate drinking time
NSAID (Na Diklofenak, Piroxicam, Ibuprofen)	Risk of bleeding / stomach ulcers	Avoid	Given to patients with pain disorders and providing information on the correct time to use the drug
Diuretik (Furosemide)	Increased risk of hyperkalemia	Avoid routine use	Use only for patients with indications of heart retention

Because it is an outpatient health center in the Kediri city region, this study was conducted at Northern City Primary Health Care Center Kediri. According to data, hypertension is among the top ten non-infectious ailments treated in outpatient care at Northern City Primary Health Care Center Kediri that provides public health services and has significant control over patients.

Based on the 2022 Beers criteria, This study looked at the prevalence of inappropriate antihypertensive medication prescribing in geriatric patients at Northern City Primary Health Care Center Kediri. Between July and December 2022, the number of hypertensive patients among geriatric patients at Northern City Primary Health Care Center Kediri was 1,392, with the samples included in this study being geriatric hypertensive patients aged over 60. Data was acquired from the prescriptions of 150 people using a random sample approach.

Based on research findings from the Rationality of Prescribing Antihypertensive Drugs for Geriatric Patients at Northern City Primary Health Care Center Kediri, patient medication prescriptions included:

1. Chlorfeniramin

Based on the Beers 2022 criterion, this is a highly cholinergic medication that should be avoided. Although it should be avoided, one factor that contributes to hypertension in the elderly is a lack of rest time. It is envisaged that providing chlorpheniramine to patients will

give adequate rest time for geriatric patients. This side effect is good for people who require rest but is irritating for those who must work at high alertness. As a result, users of Chlorpheniramine or medications containing Chlorpheniramine are not permitted to operate motor vehicles (Ibrahim et al., 2009).

#### 2. Amitriptylin

It is an antidepressant medication that is anticholinergic, sedative, and can cause hypotension or low blood pressure. Amitriptyline is prescribed for elderly hypertensive patients who complain of nerve/back discomfort and have symptoms of migraine disorder. When delivering antidepressants, the patient's age, half-life, and metabolism of the antidepressant medicine to be provided must all be considered. According to the 2019 Beers criteria, this medicine should be avoided, although it can still be administered if the timing and frequency of administration are carefully monitored (Kaplan & Sadock, 2009).

#### 3. Glimepiride

Glimepiride and Glibenclamide are diabetes medications in the sulfonylurea class. Based on the Beers 2022 criteria, it is recommended to avoid it. Administration of glimepiride aims to maintain blood sugar levels in hypertensive patients with diabetes mellitus; providing information regarding when to drink after or with meals is very important to prevent hypoglycemia in patients. Short-acting sulfonylureas such as gliclazide or glipizide are advised for elderly people. This medication is known to have less hypoglycemic side effects than glimepiride or glibenclamide. Glipizide or gliclazide should be used in groups of older individuals with an initial dose of 2.5mg once day, with the dose titrated 2.5-5mg per day at 1-2 week intervals (Jr RLM, 2013).

#### 4. NSAID

There is a risk of producing bleeding or stomach ulcers. To prevent bleeding or stomach ulcers, NSAID class medicines are administered to geriatric patients by providing instructions about when to take them after meals. NSAIDs are still commonly recommended to the elderly. NSAIDs are used to relieve pain or osteoarthritis in the elderly. The usage of NSAIDs is known to be harmful to the cardiovascular system. Giving NSAIDs to elderly people who have hypertension and are receiving antihypertensive medications can impair the effectiveness of the antihypertensive medications. ACE inhibitors, ARBs, and diuretics are antihypertensive medications that interact with NSAIDs. Side effects of this combination include hyponatremia and hyperkalemia, which are more common in senior people (Zahra & Carolia, 2017). NSAIDs block the cyclooxygenase enzyme, preventing the conversion of arachidonic acid to PGG<sub>2</sub>. Meloxicam and other NSAIDs are used to minimize the effects of the inflammatory process during the inflammatory period (2-7 days) Minkowitz RB, in Dhea (2020). Simple analgesics, such as paracetamol, are favored and are usually equally as effective in treating pain.

#### 5. Diuretik

According to the Beers 2022 guidelines, it can raise the risk of hyperglycemia and should be avoided on a regular basis. In geriatric patients, administration is limited to patients with signs of cardiac retention and is immediately discontinued if the patient shows signs of improvement. There are five antihypertensive medications. Diuretics, beta adrenergic receptor blockers (-blockers), angiotensin converting enzyme inhibitors (ACEI), angiotensin receptor blockers (Angiotensin-Receptor Blocker/ARB), and calcium antagonist (Calcium-channel blocker/CCB) are the first-line drugs used to treat hypertension. Diuretics, particularly thiazide diuretics, are advised in some types of hypertension, notably in the elderly. However, this family of medications can cause an increase in glucose, cholesterol, and uric acid. Thiazides are also known to frequently create potassium ion imbalances, resulting in hypokalemia, which can lead to deadly arrhythmias in the elderly (Paul AJ, 2014). Following that are the medications amlodipine and captopril, which are classified as CCB and ACEI, respectively. In

terms of reducing the risk of cardiovascular problems, CCBs are equally effective as diuretics, more effective than betablockers, but less effective than ACEIs (Duran-Salgado, 2015). Meanwhile, ACEI is recognized to be useful in lowering the risk of cardiovascular problems, as well as safe for the patient's kidneys and in hypertensive diabetic individuals (Vijan, 2011).

## I. Closing

### Conclusion

According to research findings from the rationality of prescribing antihypertensive drugs in geriatric patients at Northern City Primary Health Care Center Kediri, with patient medication prescriptions consisting of drug classes, types of drugs, and their quantities, the calcium-channel blocker group is the most frequently given. (CCB) amlodipine up to 93.32%.

The Beers Criteria 2022 drug use study discovered possibly inappropriate drug usage in geriatrics, specifically the use of potentially inappropriate medications in older persons was 60.67%, and drugs that should be taken with caution in Geriatric Hypertension Patients was 5.33%.

### Suggestion

Based on the findings of the research, numerous recommendations for the use of medications in geriatric patients were generated at Northern City Primary Health Care Center Kediri, namely:

1. Prospective study is needed to directly evaluate the side effects of drug use in patients.
2. Considering the suitability of drug use for the 2022 National Formulary, it is necessary to consider the use of antidiabetic drugs with short-acting effects in the treatment of geriatric patients, such as glipizide, compared to the use of other drugs, such as glimepirid, based on the recommendations of the 2022 Beers criteria.
3. There should be outreach to all health workers and other health professionals about the administration of appropriate medication for geriatrics so that maximum treatment results can be obtained, and further research on the use of potentially inappropriate medications in geriatrics should be conducted prospectively so that side effects of medication use can be monitored. straight to the patient.

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