

POLA PENGGUNAAN OBAT ANTIHIPERTENSI PADA POPULASI GERIATRI DI RUMAH SAKIT UMUM

Patterns of Use of Antihypertensive Medications in Geriatric Populations at General Hospital

Atjo Neng Mira^{1,2}, Hardjo Marhaen³, Soraya Gita Vita^{3*},

¹*Biomedical Science Study Program, Hasanuddin University, Makassar, Indonesia*

²*Nursing Study Program, Faculty of Health Sciences, Sulawesi Barat University, Indonesia*

³*Department of Biochemistry, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia*

*Corresponding Author: gitavitasoraya@unhas.ac.id

ABSTRAK

Hipertensi ialah permasalahan kesehatan utama di Indonesia dan juga di berbagai negara di dunia. Berdasarkan penelitian epidemiologi, diperoleh bahwa seiring bertambahnya usia, tekanan darah juga meningkat. Hipertensi menjadi masalah pada geriatri sebab menjadi penyebab utama penyakit jantung koroner. Tujuan: Untuk menilai pola penggunaan obat antihipertensi pada populasi geriatri dan kepatuhan pengobatan hipertensi terhadap pedoman pengobatan hipertensi JNC-8 dalam populasi geriatri. Metode: Ini adalah penelitian observasional cross-sectional menggunakan data retrospektif yang terdiri dari rekam medis pasien hipertensi rawat jalan di Rumah Sakit Umum Daerah di Kabupaten Majene, Indonesia. Sampel yang dianalisis adalah pasien geriatri (≥ 60 tahun) dengan hipertensi. Penelitian ini dilakukan antara Juli dan Oktober 2019. Hasil: Dari 196 pasien, 80 (40,81%) adalah laki-laki dan 116 (59,18%) adalah perempuan. Sebagian besar resep diberikan sebagai penggunaan terapi tunggal (72,5%) dan sisanya sebagai penggunaan terapi ganda sebagian besar terdiri dari kombinasi dua obat (27,5%). Diuretik dengan ACEI adalah kombinasi yang paling banyak digunakan (14,3%), diikuti oleh CCB dengan ACEI (7,7%) dan diuretik hemat Kalium (3,1%), CCB + ARB terakhir (2,6%). Persentase untuk pasien hipertensi stadium 1 adalah 77% dan 15,3% untuk stadium 2. Kesimpulan: Pengobatan hipertensi pada pasien geriatri di Rumah Sakit Umum Kabupaten Majene tidak sepenuhnya sesuai dengan pedoman JNC-8 saat ini.

Kata kunci: Hipertensi, Geriatri, JNC-8, Kepatuhan

ABSTRACT

Hypertension is a major health problem in Indonesia and also in various countries in the world. Based on epidemiological research, it was found that as we get older, blood pressure also rises. Hypertension is a problem in geriatrics because it is a major cause of coronary heart disease. Objective: To assess patterns of antihypertensive drug use in the geriatric population and the adherence of antihypertensive regimes towards the JNC-8 hypertension treatment guidelines within the geriatric population. Methods: This is a cross-sectional observational study using retrospective data consisting of medical records of outpatient hypertension patients at the General hospital in Majene District, Indonesia. The sample analyzed was geriatric patients (≥ 60 years) with uncomplicated hypertension. This study was conducted between July and October 2019. Results: Of 196 patients, 80 (40.81%) were male and 116 (59.18%) were female. Most of the prescriptions were given as single therapy use (72.5%) and the rest as multiple therapy use consisted mostly of a combination of two

drugs (27.5%). Diuretics with ACEi are the most used combination (14.3%), followed by CCB with ACEi (7.7%) and Potassium-sparing diuretics (3.1%), last CCB + ARB (2.6%). The percentage for stage 1 hypertension patients is 77% and 15.3% for stage 2. Conclusion: Treatment of hypertension in geriatric patients at the Majene District General Hospital is not fully in line with current JNC-8 guidelines.

Keywords: Hypertension; Geriatrics; JNC-8; Adherence

INTRODUCTION

According to the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC), hypertension is defined as blood pressure measured at or greater than 140/90 mmHg⁴. Hypertension is widely known as cardiovascular disease. In fact, deaths due to stroke and cardiovascular disease morbidity are reduced with hypertension treatment. The prevalence of hypertension in Indonesia for urban and rural areas is around 17-21%. More than half of people with hypertension in Indonesia are undetected, while those who are detected are generally unaware of the disease⁵. Longer life expectancy leads to global population growth¹⁸. Global life expectancy at birth is expected to increase from 68.6 years in 2015 to 76.2 years in 2050, with older populations representing 16.7% of the total world population at that time¹⁸. However, aging is identified as a major risk factor for major health problems, including cancer, cardiovascular disease and neurodegeneration¹², with a high prevalence of chronic diseases that are closely related to the number of drugs consumed by parents¹. The physiological changes in the organ system can affect the process of pharmacokinetics, pharmacodynamics, and the tendency for disease complications and the development of polypharmacy in the elderly making this population vulnerable

to problems related to drug use (drug-related problems / DRPs) that can worsen side effects and reduce the effectiveness of treatment². The more the amount of drug the patient uses, the higher the risk of unwanted effects and drug interactions³. To prevent and avoid problems regarding the use of antihypertensive drugs in elderly hypertensive patients so that they can provide the desired therapeutic results, it takes a good understanding of the pattern of drug use in patients^{9,11}.

JNC 8 recommendations differ from previous JNC 7 approvals, related to changes in pharmacological therapy management and blood pressure classification that are more specific than JNC 7. JNC 8 recommendations emphasize the assessment of blood pressure in post-stroke patients is <140/90 mmHg in the <60 years group and <150/90 mmHg in the ≥60 years group. The main objective of the JNC 8 guideline is to manage hypertension to achieve and maintain blood pressure targets. If the target blood pressure is not reached within one month of therapy, add the initial drug dose or add a second drug from the hypertension drug group⁴. The objective of this research is to assess patterns of antihypertensive drug use in the geriatric population and the adherence of antihypertensive regimes towards the JNC-8 hypertension treatment guidelines within the geriatric population.

METHODS

This study was an observational study using a cross-sectional descriptive

analysis design. Data collection was done retrospectively. A total of 196 medical records that met the inclusion criteria included medical records and prescriptions of patients diagnosed with hypertension aged ≥ 60 years and fulfilling the inclusion criteria and undergoing outpatient care for the period July to October 2019 at Majene General Hospital. Antihypertensive drugs, detailed epidemiological profile, presence or absence of comorbid conditions, antihypertensive drug prescribing patterns and their compliance are categorized according to JNC-8 guidelines. The patients were classified into three different age groups namely 60-79 years, 80-89 years, ≥ 90 years. Data records regarding antihypertensive monotherapy and combination therapy. Each antihypertensive drug is categorized into one of the following classes: thiazide-type diuretics, angiotensin-converting enzyme inhibitors (ACEI) or angiotensin receptor (ARB) inhibitors, calcium channel blockers (CCB), and other antihypertensive agents. Medication adherence was assessed by comparing with JNC-8 treatment guidelines for those aged ≥ 60 years at a blood pressure of 150/90 mmHg and non-black communities.

RESULTS

A total of 196 samples were randomly collected over a three month period to assess treatment adherence. Age Range Of Geriatriy Sample are shown in Table 1 with t-test shared $P= 0,965$ which mean no significant difference between the age of male and female. Of the 196 patients, 80 (40, 81%) were male and 116 (59, 18%) were female. The mean ages of male and female patients were 57.68 ± 15.32 and 61.29 ± 12.65 years

respectively. Hypertension was classified according to JNC-8 guidelines and found 77 % (Stage 1 Hypertension), 15,3% (stage 2 hypertension) and 7,6% (stage 3 hypertension) cases.

Table 1. Age Range of Geriatric Sample

Age	Male (n=80)	Female n:116)
60-74	58,9 \pm 12,3	61,3 \pm 8,3
75-89	79 \pm 4,3	1
≥ 90	1	
Age mean SD (Standar Deviation) t- test P = 0,965		

Table 2. Comparison between of the level of hypertension

Blood Pressure	n	%
Stage 1 Hypertension	151	77
Stage 2 Hypertension	30	15,3
Stage 3 Hypertension	15	7,6
Total	196	
100		

In table 3 shows the comorbidities of geriatric patients with hypertension with diabetes mellitus (1.5%), male; (2.0%) women, other cardiovascular diseases (2.0%, men; 1.0%, women), and CHF (2.0%, men; 1.5%, women).

Table 3. Distribution Of Primary Hypertension With Comorbidities

	Male	Female
Primary Hypertension	69 (35.2%)	107 (54.6%)
With:		
DM	3 (1.5%)	4 (2.0%)
CHF	4 (2.0%)	3 (1.5%)
Coronary Heart Disease	4 (2.0%)	2 (1.0%)
Total	80 (40.8%)	116 (59.2%)

Counting 72.5% of patients received single therapy use and 27.5%

used multiple therapy. Table 3 presents prescription patterns and levels of antihypertensive drugs prescribed for hypertensive patients as both single and combination therapy. Diuretics (33.2%) are the most commonly prescribed antihypertensive drugs as single therapy use followed by ACE inhibitors (28.1%) then with calcium channel blockers (10.2%). Whereas the most commonly used combination of hypertension drugs are Diuretics + ACE inhibitors (14.3%) followed by ACE inhibitors + CCB (7.7%), and Diuretics + potassium-saving diuretics (3.1%), last CCB + ARB (2.6%)

Table 4. Distribution Of Hypertension With Single and Multiple therapy use

Medication Use:	Male	Female
Single Therapy Use :		
Furosemide	29	36 (18.4%)
Captopril	(14.8%)	36 (18,4%)
Amlodipin	19	12 (6.1%)
Multiple Therapy Use:		
Furocemid+Captoril	8	19 (9.7%)
Furocemide+spirinolakton	(4.1%)	9 (4.6%)
Amlodipin+Candersartan	9	2 (1.0%)
	(4.6%)	1 (0.5%)
	6	
	(3.1%)	
	4	
	(2.0%)	
	4	
	(2.0%)	
Total	80	116
	(40.8%)	(59.2%)

DISCUSSION

Hypertension is a chronic disease that requires ongoing treatment. This study analyzes prescription patterns in geriatric hypertension patients and controls blood pressure with JNC 8 guidelines for managing hypertension, which is carried out in outpatients in general district hospitals. The choice of antihypertensive medication must be supported by each patient, taking into account any accompanying diseases such as diabetes mellitus, difficult side effects of certain drugs. The overall goal of treating hypertension is to reduce hypertension associated with morbidity and mortality. The results of this study indicate that hypertension is more common in women (52, 77%), compared to men (47, 22%). The above pattern is the same as the study conducted by Jhaj et al in India⁵. However, the above pattern is not consistent with other studies conducted by Lee et al. In China which reported a higher prevalence of hypertension in women than in men⁶. The study also revealed that hypertension was

more common in elderly patients who affected the age group 60-74 years or more.

Current research results show Diabetes mellitus (1.5%), male; (2.0%) women, other cardiovascular diseases (2.0%, men; 1.0%, women), and CHF (2.0%, men; 1.5%, women). All three are the most common comorbidities in geriatric patients with hypertension. Studies conducted by Amira et al and Kothari et al found 36.6% and 47.72% of patients suffering from comorbidities and patients at greater risk of complications. Among various diseases, cardiovascular disease is the main threat. Pai PG et al reported patients suffering from hypertension with diabetes mellitus (37, 49%) followed by heart diseases such as ischemic (7.12%), congestive heart failure (2%), and chronic kidney disease (1.1%)⁹. This is also reinforced by Niccoli & Partridge that aging is identified as a major risk factor for major health problems¹¹, including cancer, cardiovascular disease, and neurodegeneration, with a high prevalence of chronic illness that is closely

related to the number of drugs consumed by parents¹².

This study shows the 72.3% single therapy use drug group and 27.7% combination therapy. As stated by Daskalopoulou et al, as a whole, only 30% of elderly hypertensive sufferers whose blood pressure can be controlled with single therapy use. The rest is needed for combination treatment of more than one antihypertensive drug so that blood pressure returns to normal. The most commonly prescribed are loop diuretics only or in combination³. JNC Guideline 8 discusses the use of thiazide diuretic single therapy use lines followed by ACEI, ARB, and CCB or in combination to manage initial hypertension⁴. In this study the most prescribed drug was loop diuretic (33.1%) followed by ACEi (28.1%), CCB (10.2%) in single therapy use. For the use of combination drugs, most are used in combination therapy of two drugs, namely ACEi + loop diuretic (14.3%) followed by CCB + ACEi (7.7%) and potassium-sparing diuretic + diuretic (3.1%) and CCB + ARB (2.6%). So that the results obtained in this study are not in accordance with the guidelines because the JNC 8 guidelines recommend initial therapy with thiazide-type diuretics or ACEI or ARB or CCB, single or combination for patients over 60 years of age⁴.

However, although the use of loop diuretics differs from JNC-8 guidelines, it should be noted that potassium-sparing diuretics and diuretics are mainly prescribed for the treatment of hypertension and coronary heart disease in the study population. Although this group of drugs can cause unwanted electrolyte imbalances or inappropriate antidiuretic hormone secretion syndromes¹³, their use is needed in cases of heart failure. Loop diuretics are indicated for symptom control, whereas spironolactone is prescribed for its

function as a mineralocorticoid/aldosterone receptor antagonist in heart failure, as recommended in international guidelines^{14, 15}.

In addition, according to AGS, beer criteria for the use of diuretic drugs, special loop diuretics in geriatric patients, must be used with caution and followed by possible and questionable conversion conversions related to the use of diuretics for geriatrics, namely periodic examinations of body sodium levels.

CONCLUSIONS

The results obtained for the treatment of single therapy use are diuretics (33,2%), ACEi (28,1%), CCB (10,2%) and potassium-saving diuretics (1%) whereas for combination therapy ACEi + loop diuretics (14,3%) are mostly used in combination therapy of two drugs followed by CCB + ACEI (7,7%) and combination of CCB + ARB (2,6%). So it can be concluded that the results of the study show adherence to antihypertensive treatment in Majene Regency do not fully meet JNC 8 guidelines, especially for geriatric patients who need to consider the use of drugs related to the problems of aging physical limitations and complications of the disease due to thiazide diuretics, which is the first-line drugs according to JNC 8 guidelines for the initial management of hypertension and combination therapy are not used, but use the available type of loop diuretic or furosemide, which certainly requires monitoring of side effect drugs, especially for geriatric patients.

CONFLICTS OF INTEREST

The author states that there is no conflict of interest.

ACKNOWLEDGMENTS

The author would like to thank the local Community Health Center and the Government of Majene Regency.

REFERENCES

1. Charlesworth, C. J., Smit, E., Lee, D. S., Alramadhan, F., & Odden, M. C. Polypharmacy among adults aged 65 years and older in the United States: 1988–2010. *Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences*.2015; 70(8), pp. 989-995
2. Cooney D, Pascuzzi K. Polypharmacy in the elderly: focus on drug interactions and adherence in hypertension. *Clin Geriatri Med*. 2009;25:222-33.
3. Daskalopoulou SS, Rabi DM, Zarnke KB, et al. The 2015 Canadian Hypertension Education Program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. *Can J Cardiol*. 2015;31:54968.
4. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. Evidence based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*.2014;311:507-20.
5. Jhaj R, Goel NK, Gautam CS, Hota D, Sangeeta B, Sood A, et al. Prescribing patterns and cost of antihypertensive drugs in an internal medicine clinic. *Indian Heart J*. 2001; 53:323-7.
6. Lee PK, Li RK, Chan JC, Chang S, Lee SC, Tomlinson B, et al. A prescription survey in a hospital hypertension outpatient clinic. *Br J Clin Pharmacol*. 1997; 44:577-82.
7. Munger MA. Polypharmacy and combination therapy in the management of hypertension in elderly patients with co-morbid diabetes mellitus. *Drugs Aging*. 2010; 27(11):871-83.
8. Niccoli, T., & Partridge, L. Ageing as a risk factor for disease. *Current Biology*.2012;22(17), pp. R741R752
9. Pai PG, Shenoy J, Sanji N. Prescribing patterns of antihypertensive drugs in a South Indian tertiary care hospital. *Drug Invention Today*. 2011; 3(4):38-40.
10. Sica, D. A., Carter, B., Cushman, W., & Hamm, L. Thiazide and loop diuretics. *The journal of clinical hypertension*.2011;13(9), 639-643.
11. Niccoli, Teresa; Partridge, Linda. Ageing As A Risk Factor For Disease. *Current Biology*, 2012, 22.17: R741-R752.
12. Charlesworth, Christina J., et al. Polypharmacy among adults aged 65 years and older in the United States: 1988–2010. *Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences*, 2015, 70.8: 989-995.
13. Bennett, Heather, et al. The effectiveness of health coaching, home blood pressure monitoring, and home-titration in controlling hypertension among low-income patients: protocol for a randomized controlled trial. *BMC public health*, 2009, 9.1: 456.
14. Jessup, Mariell, et al. 2016 ESC and ACC/AHA/HFSA heart failure guideline update—what is new and why is it important?. *Nature Reviews Cardiology*, 2016, 13.10: 623.
15. Yancy, Clyde W., et al. 2013 ACCF/AHA guideline for the

- management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Journal of the American College of Cardiology*, 2013, 62.16: e147-e239.
16. American Geriatrics Society 2015 Beers Criteria Update Expert Panel, et al. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. *Journal of the American Geriatrics Society*, 2015, 63.11: 2227-2246.
17. Romday, Rakesh; Gupta, Ajay Kumar; Bhambani, Pawan. An assessment of antihypertensive drug prescription patterns and adherence to Joint National Committee-8 hypertension treatment guidelines among hypertensive patients attending a tertiary care teaching hospital. *Int J Res Med Sci*, 2016, 4.12: 5125-5133.