The Relationship between Adherence to Antihypertensive Medication and Microalbumin Levels in Hypertension Prolanis Patients

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ABSTRACT

Hypertension is one of the main health problems faced by people throughout the world, including in Indonesia. Uncontrolled hypertension can cause various complications such as heart disease, stroke and kidney damage. Microalbuminuria, namely the presence of small amounts of albumin in the urine, is an early indicator of kidney damage. In hypertensive patients, microalbuminuria can be an early sign of hypertensive nephropathy, which is a serious complication of high blood pressure. Compliance with taking medication affects blood pressure control. This study aims to evaluate the relationship between adherence to antihypertensive medication and microalbumin levels in hypertension prolanis patients. This research is observational analytic with a cross sectional approach. Data was obtained prospectively in the period July-August 2024 with a sample size of 33 respondents. Medication adherence was taken using a questionnaire, and data on microalbuminuria levels was obtained through medical record data. Next, the results were subjected to a chi-square statistical correlation test. Microalbumin levels and medication adherence blood pressure lowering medication, obtained a value of $p = 0.0$ ($p < 0.05$) which indicates that statistically there is a significant relationship between microalbumin levels and compliance of taking blood pressure lowering medication. The frequency distribution of hypertensive sufferers with high microalbumin levels, namely ≥ 30 mg/dL, shows a result of 51.6% (17 patients).

Keywords: medication adherence, micro albumin levels, blood pressure

INTRODUCTION

Hypertension or high blood pressure is one of the main health problems faced by people around the world. According to World Health Organization (WHO, 2023) the global prevalence of hypertension was 26.4%, or 972 million people suffering from hypertension. Globally, hypertension is one of the most common health issues and a major cause of morbidity and mortality, approximately 1.13 billion people globally suffer from hypertension, with increasing prevalence especially in developing countries, including Indonesia.

Based on data from the Kudus District Health Office in 2018, the number of hypertension sufferers in Kudus was 20,224. Srikandi Clinic is one of the clinics in Kudus that collaborates with BPJS Health and routinely manages hypertensive Prolanis patients. Hypertension is often called the "silent killer" as it can cause serious complications (Lestari & Anisa, 2022).

Uncontrolled hypertension can lead to various complications, such as heart disease, stroke, and kidney damage. Microalbuminuria, or the presence of small amounts of albumin in urine, is an early indicator of kidney damage. In hypertensive patients, microalbuminuria can be an early sign of hypertensive nephropathy, a serious complication of high blood pressure (Rachmawati, 2024). The main challenge in managing hypertension is the low level of awareness and medication adherence among patients. Noncompliance with treatment is often due to various reasons, such as lack of understanding of the disease, drug side effects, treatment costs, and limited access to healthcare services (Poudel et al., 2012).

Previous research from Lestari and Anisa (2022) shows that good blood pressure control can reduce the risk of microalbuminuria and progression of kidney damage. Studies have also shown that good blood pressure control can decrease the risk of hypertension-related complications, such as coronary heart disease, stroke, and hypertensive nephropathy. However, despite the benefits of good blood pressure control being clear, many patients fail to achieve the desired target blood pressure. Consequently, uncontrolled blood pressure can lead to the development of microalbuminuria (Astuti et al., 2021).

The main challenge in managing hypertension is the low level of awareness and patient adherence to treatment. Many patients are unaware that they suffer from hypertension until serious complications occur. Even after diagnosis, adherence to treatment is often low due to factors such as lack of understanding of the disease, drug side effects, treatment costs, and access to healthcare (Chantzaras & Yfantopoulos, 2022).

Previous studies have shown that good blood pressure control can reduce the risk of hypertension-related complications, such as coronary heart disease, stroke, and hypertensive nephropathy. However, despite the clear benefits of blood pressure control, many patients fail to reach the target blood pressure. This underscores the need for more effective strategies to improve patient awareness and adherence to hypertension treatment (Saadat et al., 2015).

Hypertension remains a significant health issue in Indonesia at 2023. According to data from the Ministry of Health, approximately 34.1% of the Indonesian population suffers from hypertension, with about 76% of them undiagnosed. This means that many people are unaware they have high blood pressure, which increases the risk of heart disease, stroke, kidney failure, and other serious illnesses (Kementerian Kesehatan RI, 2018).

Several factors contribute to the high prevalence of hypertension in Indonesia, including unhealthy diets characterized by excessive sugar, salt, and fat intake, as well as insufficient

physical activity. Although awareness of the importance of exercise and healthy eating habits is growing, many people have not yet implemented the lifestyle changes necessary to prevent hypertension. To solve this problem, the Ministry of Health has implemented various programs, including early detection through Posbindu PTM (Integrated Development Posts for Non-Communicable Diseases) and improved access to healthcare services at Community Health Centers. These programs aim to increase public awareness about the importance of monitoring blood pressure and adopting healthy lifestyles to prevent and manage hypertension (Lam & Fresco, 2015).

Prolanis (Chronic Disease Management Program) is a program designed by BPJS Health to manage chronic diseases, including hypertension. This program aims to improve patients' quality of life through comprehensive and sustainable management. An important component of managing hypertension is adherence to taking antihypertensive medication. This adherence is crucial to maintaining controlled blood pressure and preventing complications (Daugherty et al., 2012). Microalbuminuria, the presence of small amounts of albumin in urine, is an early indicator of kidney damage. In hypertensive patients, microalbuminuria can be an early sign of hypertensive nephropathy, a serious complication of high blood pressure. Research has shown that good blood pressure control can reduce the risk of microalbuminuria and progression of kidney damage (Basi et al., 2008).

However, despite the well-known importance of medication adherence, many patients do not adhere to their medication schedules. Factors such as discomfort from drug side effects, lack of awareness about the importance of adherence, and financial issues can influence patients' adherence to treatment. This study aims to understand the relationship between adherence to antihypertensive medication and microalbumin levels in Prolanis hypertensive patients at Srikandi Husada Clinic, Kudus. This relationship hoped can understanding that valuable information can be obtained to improve hypertension management and prevent complications, particularly those related to kidney damage. Additionally, this study aims to identify factors affecting medication adherence to develop more effective interventions for improving patient compliance.

METHODS

In this research activity, the research team used the following methods:

Problem Analysis and Licensing Procedures

At this stage, activities involved analyzing problems to determine the primary issues faced by hypertensive patients and how the partners' efforts address these problems. Subsequently, the needs were identified to provide solutions related to the main issues experienced by the partners. Elevated microalbumin levels can be influenced by uncontrolled blood pressure in patients. Factors that affect blood pressure in hypertensive patients include medication adherence. Through this research, the extent to which adherence to medication by hypertensive patients managed by the partner impacts microalbumin levels can be assessed. After identifying the problems and the proposed solutions, the licensing process to conduct research at the partner's location was carried out.

Data Collection, Processing, and Analysis

The research follows a simultaneous process. It is an observational analytic study with a cross-sectional approach. Data were collected prospectively during the period of July–August 2024 with a sample size of 30 respondents. Medication adherence was measured using a questionnaire, and microalbumin levels were obtained from medical record data.

Inclusion Criteria for Patients

The participants in this study are individuals aged between 18 and 65 years. They have been diagnosed with hypertension, either with or without comorbid conditions. Additionally, they have been receiving drug therapy for hypertension for at least one month. All participants are also actively enrolled in the Prolanis program at the Srikandi Husada Clinic in Kudus.

Exclusion Criteria

Patients who declined to participate and pregnant patients. Data were obtained from interviews, questionnaires, and patient medical records. Adherence to medication was assessed using the Medication Adherence Report Scale (MARS-5), which consists of five questions. The higher the score obtained, the better the patient's level of adherence to taking medication.

The target blood pressure level was set at 120/80 mmHg. Statistical correlation analysis was conducted to determine the relationship between medication adherence and blood pressure levels using the chi-square test. A p-value of <0.05 was considered statistically significant.

Both systolic and diastolic blood pressure levels were retrieved from patient medical records. Additionally, the relationship between medication adherence and patients' quality of life was analyzed statistically using Spearman's Rho test. A p-value of <0.05 was considered statistically significant. The strength of the correlation was categorized as follows: r = 0.00–0.25 (very low correlation), r = 0.26–0.50 (moderate correlation), r = 0.51–0.75 (strong correlation), r = 0.76–0.99 (very strong correlation), and r = 1.00 (perfect correlation).

RESULTS

Characteristics of Respondents Based on Gender and Age

The distribution of gender and age categories of the respondents, as obtained from medical records, is as follows:

Table 1. Characteristics Based on Gender and Age of Prolanis Hypertension Patients

Characteristics of Respondents	N	Precentage (%)
Gender		
Male	3	10,0
Female	30	90,0
Age		
30-39 years	3	9,0
40-49 years	7	21,3
50-59 years	14	42,5
60-69 years	9	27,2

Based on Table 1 above, the characteristics of respondents in terms of gender are as follows: 3 males (10%) and 30 females (90%). In terms of age, the majority of respondents are aged 50-59 years, with 14 individuals (42.5%), while the fewest respondents are in the 30-39 years age group, with 3 individuals (9%).

Characteristics of Blood Pressure Medication Adherence

The distribution of the category of Blood Pressure Medication Adherence of respondents, obtained through medical records, yielded the following results:

Table 2. Characteristics of Blood Pressure Medication Adherence in Hypertension Prolanis Patients

Medication Adherence in Hypertension	N	Precentage (%)
Normal	9	27,3
Low	16	48,5
High	8	24,2
Total	**33**	**100,0**

Based on Table 2 above, it shows that the respondents with normal blood pressure medication adherence in hypertension Prolanis patients were 9 people (27.3%), low adherence was 16 people (48.5%), and high adherence was 8 people (24.2%).

Characteristics of Microalbumin Levels

Table 3. Characteristics of Microalbumin Levels in Hypertension Prolanis Patients

Characteristics of Microalbumin Levels	N	Precentage (%)
Normal <30 Mg/dL	16	48,4
High ≥30 Mg/dL	17	51,6
Total	**33**	**100,0**

Based on Table 3 above, it shows that the respondents with normal microalbumin levels in hypertension Prolanis patients were 16 people (48.4%), and those with high microalbumin levels were 17 people (51.6%).

Results of Chi-Square Test for Blood Pressure Medication Adherence and Microalbumin Levels

Table 4. Results of Chi-Square Test for Medication Adherence in Hypertension Prolanis Patients at Srikandi Husada Clinic Kudus

Inspection		Micro Albumin				*P*-Value
		Normal <30 Mg/Dl	%	High ≥30 Mg/dL	%	
Medication	Normal	9	27,3	16	48,4	0,017
Adherence in	High	16	48,5			
Hypertension	Low	8	24,2	17	51,6	

The table above shows that the results of the Chi-Square analysis between blood pressure medication adherence and microalbumin levels in hypertension Prolanis patients yielded the following results: for the group with normal blood pressure medication adherence and normal microalbumin levels, there were 9 individuals (27.3%); for normal blood pressure medication adherence with high microalbumin levels, there were 16 individuals (48.4%); for high blood pressure medication adherence with normal microalbumin levels, there were 8 individuals (24.2%); and for high blood pressure medication adherence with high microalbumin levels, there were 17 individuals (51.6%).

The Chi-Square test results for blood pressure medication adherence and microalbumin levels in hypertension Prolanis patients showed a p-value of 0.017 (p < 0.05), indicating that statistically there is a significant relationship between blood pressure medication adherence and microalbumin levels.

DISCUSSION

Based on the data, the number of respondents with normal blood pressure medication adherence in hypertension Prolanis patients representing 27.3%. The number of respondents with high blood pressure medication adherence in hypertension Prolanis patients representing 24.2%. This shows that in hypertension Prolanis patients, normal blood pressure medication adherence is higher compared to high blood pressure medication adherence. The table also shows that the number of patients with high microalbumin levels is greater than the number with normal microalbumin levels. A study by Nurdin et al (2024) also showed similar results, where the research found that most respondents with high medication adherence.

The number of hypertension patients with normal microalbumin levels 48.4%, while the number with high microalbumin levels 51.6%. This data shows that more hypertension patients have high microalbumin levels than those with normal levels. Various factors may cause an increase in microalbumin levels, such as acute infections, burns, and stress from surgery or heart attacks. Hypertension caused by high blood pressure can also lead to narrowed and damaged arteries that supply blood to the heart, leading to coronary artery disease. Insufficient blood flow to the heart can cause chest pain, known as angina. This can lead to an irregular heartbeat, called arrhythmia. In a normal state, blood pressure helps maintain stability and balance in blood flow, preventing complications from other diseases. However, in hypertensive patients, increased blood pressure can lead to complications (Lacerda et al., 2016).

The target blood pressure and microalbumin levels for hypertension, according to PERKENI, 2021 are as follows: Normal Blood Pressure Value: 120/80 mmHg Normal Microalbumin Value: < 30 mg/dL. Indicating a statistically significant relationship between blood pressure medication adherence and microalbumin levels. This suggests that patients with elevated blood pressure (>120/80 mmHg) may have an increased risk of microalbumin levels, highlighting the strong association between microalbuminuria and hypertension. It indicates that microalbuminuria can serve as a useful marker to assess the management of cardiovascular and kidney disease risk (Ali et al., 2014). This research is in line with Poudel et al. which 51.88% of hypertension cases and 13.2% of normotensive controls had microalbuminuria in total. By showing strong association between microalbuminuria and hypertension, our findings suggest that microalbuminuria could be a useful marker to assess risk management of cardiovascular disease and renal disease (Poudel et al., 2012).

CONCLUSION

Based on the results of the study, it can be concluded that: The frequency distribution of hypertensive patients with high microalbumin levels ≥30 mg/dL shows a result of 48.4% (16 patients). The frequency distribution of hypertensive patients with normal microalbumin levels <30 mg/dL shows a result of 27.3% (9 patients). The frequency distribution of hypertensive patients with high microalbumin levels based on age shows that the age range of 50–59 years has a percentage of 42.5% (14 individuals). The frequency distribution of hypertensive patients with high microalbumin levels based on gender shows that the majority are female, with a percentage of 90%. There is a significant relationship between blood pressure medication adherence and microalbumin levels in hypertensive patients at Srikandi Husada Clinic Kudus.

LIMITATION

The limitations encountered during the research are as follows:

1. In the data collection process, the researcher initially used Google Forms to gather responses. However, many respondents failed to fill out the form due to inactive phone numbers, which created obstacles in the data collection process.

2. While completing the questionnaire, some respondents had impaired vision and struggled to fully understand the questions. As a result, the researcher assisted by reading the questions aloud to help the respondents complete the questionnaire more easily.

3. The researcher employed an analytical observational method with a cross-sectional approach, which had been used in previous studies. However, the researcher did not use validity and reliability tests that were closely aligned with the characteristics of the current respondents. The researcher suggested that future studies should pay closer attention to ensuring the characteristics of the respondents match the measurement tools used.

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