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Implementation of Laboratory Examination of Hypertension and Diabetes Mellitus Prolanis Patients at UPTD Sukabumi City Health Laboratory

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Abstract: The results of the 2018 Riskesdas for Non-Communicable Diseases (NCDs) experienced an increase in incidence from . The government, through BPJS Health, launched the prolanis program to prevent degenerative diseases. Sukabumi City Health Laboratory UPTD has provided laboratory examination services for patients with prolanis hypertension and prolanis diabetes mellitus. This research is a descriptive analysis with a cross sectional design. The research population was prolanis patients in the hypertension category and diabetes mellitus category. The sampling technique uses a total sampling of 366 samples. The number of samples in the hypertension category was 249. There were 117 patients in the diabetes mellitus category. The results of this study illustrate that the majority of patients had cholesterol, urea, creatinine and microalbumin levels in the normal range. However, there are some patients who have such high levels of HBA1c that require further monitoring and appropriate intervention to reduce the risk of health complications.

Keywords: prolanis, hypertension, diabetes mellitus

INTRODUCTION

According to the World Health Organization (WHO) (in Samiati, 2019:3), chronic diseases are medical conditions that last for a long period of time and tend to develop slowly as a result of genetic, physiological, environmental, and behavioral factors. At the global, regional and national levels, it is projected that by 2030 there will be a shift in disease patterns from infectious to non-communicable diseases. This transition is triggered by changes in life style, unhealthy diet, increased life expectancy, and demographic changes. This has led to an increase in the incidence of chronic diseases such as heart disease, diabetes, hypertension, cancer, and chronic respiratory disorders. Therefore, prevention and public health promotion efforts are becoming increasingly important in facing these challenges.

Hypertension and diabetes mellitus are becoming increasingly common over time. These two chronic diseases are often referred to as silent killers because they often go undetected by sufferers, cause no symptoms, and cause serious complications when they occur.

Data from the 2018 Basic Health Research (Riskesdas) shows an increase in the incidence of non-communicable diseases (NCDs) when compared to the 2013 Riskesdas results. NCDs that experienced increases included cancer, stroke, chronic kidney disease, diabetes mellitus, and hypertension. The prevalence of cancer increased from 1.4% to 1.8%, while the incidence of stroke rose from 7% to 10.9%, and cases of chronic kidney disease increased from 2% to 3.8%. From the blood sugar level examination, diabetes mellitus increased from 6.9% to 8.5%, while from blood pressure measurement, the incidence of hypertension increased from 25.8% to 34.1%.

BPJS Kesehatan argues that the increase in cases has made the Indonesian government have to overcome the state deficit caused by BPJS Kesehatan's medical expenses that cannot be fully covered by participants' contributions. In the Regulation of the Health Social Security Organizer Number 01 of 2014 concerning the Implementation of Health Insurance, BPJS Kesehatan took preventive and promotive steps by launching the Chronic Disease Management Program (PROLANIS) to prevent complications of degenerative diseases. Prolanis is a coordinated health care system and proactive approach, involving participants, health facilities, and BPJS Kesehatan. The aim is to care for the health of BPJS Kesehatan participants who experience chronic diseases, in this case patients with diabetes mellitus and hypertension, in order to achieve optimal quality of life by using health service costs effectively and efficiently, so as to prevent the onset of disease complications. First-level health facilities can identify prolanis participants based on health history screening and or the results of diabetes mellitus and hypertension diagnoses (at first-level health facilities or hospitals).

Puskesmas in Sukabumi City have been running prolanis since 2014 which includes prolanis exercises, health education, health consultation by the examining doctor at the local puskesmas, drug services, and health status monitoring including weight, height and abdominal circumference measurements. In 2023, prolanis health checks registered at 15 health centers in Sukabumi City were more comprehensive, with laboratory tests every 6 months. These include HBA1c, total cholesterol, triglycerides, HDL cholesterol, LDL cholesterol, ureum creatinine, microalbumin for patients with diabetes mellitus. As for hypertensive patients, it includes checking total cholesterol, triglycerides, HDL cholesterol, LDL cholesterol, ureum creatinine. Based on this background, this study aims to determine how the implementation of laboratory examinations for diabetes mellitus and hypertension prolanis patients at the Sukabumi City Health Laboratory UPTD.

METHOD

This study is a descriptive analysis with a cross sectional design using secondary data, namely data on the coverage of laboratory tests for 366 prolanis patients. The sample selection method is total sampling, which means that the entire population is sampled. Data collection was conducted in January 2024 at the Sukabumi City Health Laboratory Regional Technical Implementation Unit. The population of this study were prolanis diabetes mellitus and hypertension patients registered at 15 health centers in Sukabumi City in semester 2, namely the July-December 2023 period. The data in this study were secondary data from the prolanis program of the Sukabumi City Health Laboratory.

RESULTS AND DISCUSSION

Here are the reference values for each prolanis examination:

Table 1
Prolanis checkup referral value

No	Type of Inspection	Normal Range
1	Ureum	10-50 mgr/dl
2	Kreatinin	0,7-1,3 mgr/dl
3	HBA1c	< 7%
4	Microalbumin	<20 mgr/dl
5	Kolesterol Total	0-200 mgr/dl
6	Kolesterol LDL	< 100 mgr/dl
7	Kolesterol HDL	>40 mgr/dl
8	Trigliserida	<150 mgr/dl

Source: aplikasi pcare

In 2023, prolanis participants registered at 15 health centers in Sukabumi City have received laboratory testing services. The following is the number of patients who received laboratory examination services for semester 2 of the July-December 2023 period:

Table 2
Number of patients participating in prolanis who received laboratory services

No	Diagnosis of Chronic Disease	Jml
1	Hypertension	249
2	Diabetes Mellitus	117
	Total	366

Source: Prolanis Labkes Kota Sukabumi 2023

During the July-December 2023 period, UPTD Laboratorium Sukabumi City has served 249 prolanis patients diagnosed with hypertension and 117 patients diagnosed with diabetes mellitus.

Table 3
Age range of prolanis participants who received laboratory services

No	Age Range	HT	DM
1	20-39	13	4
2	40-59	141	58
3	60-69	70	40
4	70-79	24	13
5	≥80	1	2
	Total	249	117

Source: Prolanis Labkes Kota Sukabumi 2023

From the data above, we can know that between the ages of 20-39, 13 people diagnosed with hypertension and 4 people diagnosed with diabetes received services. In this age range, fitness and health should still be optimal. However, this age range is not a guarantee of immunity to chronic diseases such as hypertension and diabetes. Although these diseases are often associated with old age, hypertension and diabetes mellitus have become significant health problems among the 20-39 age group. Factors such as unhealthy lifestyle, poor eating habits, lack of physical activity, stress, and genetic factors can all increase a person's risk of suffering from a disease including hypertension and diabetes. In line with the results of Riskesdas 2018 which states that 26.5% of people aged 20-39 years lack physical activity. The age range 40-59 diagnosed with hypertension and 58 people diagnosed with DM received

laboratory services. The age range 60-69 or pre elderly were diagnosed with hypertension, and 40 people diagnosed with DM received laboratory services. While for the elderly, namely the age range 70-79, 24 people were diagnosed with HT, and 13 people diagnosed with DM received laboratory services. Elderly with high risk > 80 years as many as 1 person diagnosed with HT and 2 people diagnosed with DM get laboratory services.

Table 4
Prolanis services by gender

Diagnosis of Chronic Disease	L	P	Total
Hypertension	23	226	249
Diabetes Mellitus	10	107	117
Total	33	333	

Source: Prolanis Labkes Kota Sukabumi 2023

The data above shows that of the total hypertension patients observed 23 were male, and 226 were female. and of the total diabetes mellitus patients 10 were male, and 107 were female. The data shows that for both hypertension and diabetes mellitus, the number of women with the disease is much higher than the number of men. This may indicate that there are certain patterns or risk factors that are more dominant in suffering from these two diseases, or this could occur because the level of awareness of women to check themselves is higher than men.

Table 5
Examination results of Patients with Hypertension Prolanis

Inspection	Normal	High
Total Cholesterol	217	75
Trigliserida	156	93
HDL Cholesterol	204	45
LDL Cholesterol	125	124
Ureum	243	6
Kreatinin	203	46
Mikroalbumin	168	81

Source: Prolanis Labkes Kota Sukabumi 2023

From the data above, we can know that out of 249 hypertensive patients, there are 217 (87%) people with normal cholesterol results and 75 (13%) people with high cholesterol results. This means that of the total hypertensive patients examined, the majority had cholesterol results in the normal range. This shows that hypertension is not always directly correlated with high cholesterol levels, because the majority of hypertensive patients have cholesterol in the normal range. Although the majority of hypertensive patients had normal cholesterol, there were also a number of targets who had high cholesterol. This shows the importance of paying attention to cholesterol levels in the management of hypertension, as high cholesterol levels can lead to more serious complications.

Triglycerides are a type of fat in the blood that is a form of energy storage in the human body. These fats are found in foods and are also produced by the body in response to food consumption. Triglycerides serve as an important source of energy for the body. However, high triglyceride levels can increase the risk of cardiovascular diseases such as coronary heart disease, stroke, and other vascular diseases. From the data above, we can know that of the total hypertensive patients, 156 (62.6%) were in the normal triglyceride range, and 93 (37.3%) of them were in the high triglyceride range. This means that of the total hypertensive patients, the majority had triglyceride levels within the normal range, indicating that most hypertensive patients have triglyceride levels that are within the normal range, which can reduce the risk of

health complications. However, there is a significant number, namely 93 or about 37% of the total hypertensive patients have high triglyceride levels. It is therefore important to monitor and manage triglyceride levels especially in people with hypertension to reduce the associated health risks.

HDL cholesterol is a type of cholesterol in the blood known as "good cholesterol". HDL carries cholesterol from various parts of the body back to the liver, where it is broken down and excreted from the body. HDL's main function is to clear excess cholesterol from the artery walls, thus helping to prevent plaque buildup that can lead to coronary heart disease and other disease complications. High HDL cholesterol levels are considered beneficial as they can help protect the health of the heart and blood vessels. From the data above, we can see that 204 people have normal HDL, and 45 people have high HDL. This is a favorable thing because normal HDL can help protect heart health, high HDL levels are often associated with increased heart and blood vessel disease.

LDL cholesterol is often called "bad cholesterol". If LDL levels are too high, it can build up on artery walls, causing hardening of the arteries. From the data above we can know that there are 125 people with normal LDL levels, and 124 people with high LDL levels. Of the total sample, 125 people or 50% had LDL levels in the normal range, this is a positive value because normal LDL levels mean that there is no accumulation of cholesterol plaques on the artery walls. Meanwhile, high LDL levels are a serious risk factor for heart disease and other complications.

Ureum is one of the indicators in blood and urine tests to determine kidney function and protein metabolism. Elevated levels of ureum in the blood may indicate impaired kidney function.

From the data above, the majority of hypertensive patients, namely 243 people, have ureum levels in normal conditions. While 6 other people have high ureum levels.

In addition to ureum, creatinine is also an indicator of impaired kidney function if its level increases in the blood. From the data above, we can know that there are 203 people with normal creatinine levels and 46 people with high creatinine levels.

The microalbumin test is a test that is usually done to detect the presence of elevated albumin levels in the urine. This can be an indication of damage to the structures in the kidneys that are responsible for filtering valuable substances from the blood and removing waste substances in the urine. From the data above we can know that there are 168 people with normal microalbumin and 81 people with high microalbumin levels. This means that the majority of people in the sample had normal microalbumin levels, which is a positive indication for vascular and kidney health. The presence of a number of people with high microalbumin levels indicates a significant health risk, especially related to vascular and kidney problems.

Table 6
Results of examination of patients with Prolanis Diabetes Mellitus

Inspection	Normal	High
HBA1c	25	92
Kolesterol Total	83	34
Trigliserida	64	53
HDL Kolesterol	89	28
LDL Kolesterol	83	34
Ureum	111	6
Kreatinin	97	20
Mikroalbumin	83	34

Source: Prolanis Labkes Kota Sukabumi 2023

From the data above we can know, for patients with the DM prolanis category from the total sample examined, namely 117 samples, HBA1c with normal values were 25 people (21.37%), and with high values were 92 people (78.63%).

With only 21.37% of DM prolanis patients having HBA1c values within the normal range, this indicates that most patients may not monitor and regulate blood sugar levels to remain stable and in accordance with the normal target of <7%. This could be due to various factors such as medication non-compliance, unhealthy diet, or lack of physical activity. These data emphasize the importance of expanding diabetes mellitus (DM) management, especially for patients with high HBA1c. Comprehensive and coordinated care, including patient education, diet planning, regular monitoring of sugar levels, and stress management may be needed to support monitoring of sugar levels in these patients.

The high number of DM prolanis patients with high HBA1c values indicates the need for improved screening and early detection of diabetes mellitus. Identifying patients at an early stage will help prevent long-term complications, and the incidence of DM can be controlled. This data also emphasizes the importance of DM prevention through healthy lifestyle management, including a balanced diet, regular physical activity, and monitoring of body mass index (BMI).

Of the 117 people examined, 83 people (70.94%) had total cholesterol within the normal range, while 34 people (29.06%) had high total cholesterol. This indicates that most patients had total cholesterol within the normal range, but there were a number who had high total cholesterol, which is a risk factor for heart and vascular disease.

For triglycerides, out of 117 patients, 64 people (54.70%) had triglyceride levels within the normal range, while 53 people (45.30%) had high triglyceride levels. High triglyceride levels are also a risk factor for heart and vascular disease.

A total of 89 people (76.07%) had HDL cholesterol within the normal range, while 28 people (23.93%) had high HDL cholesterol. High HDL cholesterol is generally considered good as it can help protect against heart disease.

As for the LDL or "bad cholesterol" examination, out of 117 patients, 83 people (70.94%) had LDL cholesterol within the normal range, while 34 people (29.06%) had high LDL cholesterol. High levels of LDL cholesterol are a major risk factor for heart and vascular disease.

Of the 117 patients, 111 people (94.87%) had ureum within the normal range, while 6 people (5.13%) had high ureum. High ureum levels may indicate kidney problems or other health issues.

CONCLUSIONS AND SUGGESTIONS

UPTD Laboratorium Kesehatan Kota Sukabumi has conducted laboratory tests for prolanis patients with hypertension and diabetes mellitus registered in 15 health centers in Sukabumi City. The number of samples with hypertension category was 249. Meanwhile, there were 117 patients with diabetes mellitus. The age range was 20 - >80 years. There were 23 male hypertensive patients and 226 female hypertensive patients. For patients with diabetes mellitus category, there were 10 men, 107 women. The results of this study illustrate that most patients have cholesterol, ureum, creatinine, and microalbumin levels within the normal range. However, there are some patients who have high levels such as HBA1c which require further monitoring and appropriate interventions to reduce the risk of health complications.

Advice

The following are suggestions in this study:

1. Conduct joint evaluations between the health office, BPJS, puskesmas and laboratories regarding examination results so that follow-up can be carried out in an integrated manner.

2. Hypertension and diabetes mellitus require comprehensive treatment, for which there is a need for cooperation between the health team of doctors, nurses, nutritionists, families, and certainly the patients themselves.
3. This study can be used for further research as information to conduct more in-depth research on factors affecting hypertension and diabetes mellitus and their complications.

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