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SEDIMENT DESCRIPTION OF URINE IN PATIENTS IN THE WORKING AREA OF THE KABILA HEALTH CENTER, 2020

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ABSTRACT

Hypertension can cause complications, one of which is interference with kidney function, one of the tests to see kidney function is urine sediment. This study aims to see the description of urine sediment in hypertensive patients in the Kabila Health Center working area in 2020.

This research is a quantitative descriptive study with a cross sectional study design with a sampling method, namely simple random sampling with a total sample of 28 urine samples. The results obtained were 64.3% amorphous uric urine sediment, 10.7% uric acid crystals, 7.1% ammonium biurate, 17.9% calcium oxalate crystals, 3.6% fatty acid cylinders, 3.6% calcium monohydrate. , hyaline cylinder 7,1%, leucine 3,6% and calcium phosphate crystal 3,6%.

Based on the results of the study, the most types of sediment were in hypertensive patients, namely amorphous veins 64.3%, many hypertensive patients were in the age category> 40 years 82.1% and many were found in 60.7% women, most hypertensive patients were non-smokers 78.6%, because there was some abnormal urine sediment, it was necessary to carry out further studies with a larger population so that it could represent the hypertensive population.

Keywords: urine sediment and hypertension

INTRODUCTION

The highest cause of death in Indonesia is non-communicable disease where non-communicable disease is an important health problem and at the same time the morbidity and mortality of this disease is increasing so that it becomes a double burden in health services [6].

One of the non communicable diseases is hypertension, hypertension is a serious medical condition that significantly increases the risk of heart attack, stroke, kidney failure and blindness. Approximately 1.13 billion people have hypertension, only 1 in 5 of which is controlled [18]. The number of people with hypertension continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 10.44 million people die from hypertension and its complications [18].

Hypertension itself is one that can cause the kidneys. It is believed that chronic increased pressure and strain on the arterioles and glomeruli can cause sclerosis of the glomerular blood vessels or what is often referred to as glomerulosclerosis. The decrease in the number of nephrons will cause an adaptive process, namely increased blood flow, increased LFG (Glomerular Filtration Rate) and increased urine output in the nephrons that are still persistent. This process involves hypertrophy and vasodilation of the nephrons as well as functional changes that reduce vascular

resistance and reabsorption of tubules in the surviving nephrons. Changes in kidney function over a long period of time can result in further damage to the existing nephrons. Sclerotic lesions that form more and more so that it can cause a straight obliteration,

This has prompted researchers to examine the description of urine sediment in hypertensive patients in the Kabila Health Center work area in 2020.

RESEARCH METHODOLOGY

This type of research is a descriptive quantitative approach. Data collection techniques use questionnaires and laboratory tests using tools and materials, namely microscopes, object glasses, deckglass, centrifuge, test tubes, pasteur pipettes, labels, urine sample pots and samples used, namely urine during the sampling technique using the simple random sampling method. . The data analysis technique used SPSS frequency distribution with univariate type.

RESEARCH FINDINGS

Table 1. Distribution of Urine Sediment Examination Results in Hypertension Patients.

No.	Types of Urine Sediment	Amount of Urine Sediment	Percent (%)
1	Amorphous veins	18	64.3%
2	Uric acid crystals	3	10.7%
3	*Ammonium* biuret	2	7.1%
4	Calcium oxalate crystals	5	17.9%
5	Fatty acid cylinder	1	3.6%
6	*Monohydrate calcium*	1	3.6%
7	Hyaline cylinder	2	7.1%
8	*Leucine*	1	3.6%
9	Calcium phosphate crystals	1	3.6%

Based on the results of urine sediment examination in hypertensive patients, it was found that the results of the examination were more amorphous uricine sediments found 64.3% compared to calcium oxalate crystal urine sediment 17.9%, uric acid crystal urine sediment 10.7%, ammonium biuret urine sediment 7 , 1%, hyaline cylinder urine sediment 7,1%, fatty acid cylindrical urine sediment 3,6%, calcium monohydrate 3,6% urine sediment, leucine urine sediment 3,6% and the last type of urine sediment is calcium phosphate crystal 3 , 6%.

Table 2. Distribution of Hypertension Patients by Age.

Age	Result	Presentation (%)
<40 years	5	17.9%
> 40 years	23	82.1%
Total	28	100%

Based on the results of urine sediment examination in hypertensive patients, it was found that the most respondents were in the age category> 40 years 82.1% compared with the age category <40 years 17.9%.

Table 3. Distribution of Hypertension Patients by Gender.

Gender	Result	Presentation (%)
Male	11	39.3%
Women	17	60.7%
Total	28	100%

Based on the results of urine sediment examination in hypertensive patients, it was found that the most respondents were female, 60.7% compared to male, 39.3%.

Table 4. Distribution of Hypertension Patients by Gender.

Smoker	Result	Presentation (%)
Smoke	6	21.4%
Do not smoke	22	78.6%
Total	28	100%

Table 5. Distribution of Urine Sediment Examination Results by Age

Urine Sediment	Age				Total
	<40 years		> 40 years		
	Result	(%)	Result	(%)	
Amorphous veins	4	22.2%	14	77.8%	100%
Uric acid crystals	0	0	3	100%	100%
Ammonium biuret	1	50%	1	50%	100%
Calcium oxalate crystals	2	40%	3	60%	100%
Fatty acid cylinder	0	0	1	100%	100%
Monohydrate calcium	0	0	1	100%	100%
Hyaline cylinder	1	50%	1	50%	100%
Leucine	0	0	1	100%	100%
Calcium phosphate crystals	0	0	1	100%	100%

Based on the results of urine sediment examination in hypertensive patients, it was found that amorphous urate was more than 40 years old, 77.8% compared to those aged <40 years 22.2%, uric acid crystals were only found at age> 40 years 100%, ammonium biuret was found age <40 years 50% and> 40 age> 40 years 100%.

Table 5. Distribution of Urine Sediment Examination Results Based on Gender

Urine Sediment	Gender				Total
	Male		Women		
	Result	(%)	Result	(%)	
Amorphous veins	8	44.4%	10	55.6%	100%
Uric acid crystals	1	33.3	2	66.7%	100%
Ammonium biuret	1	50%	1	50%	100%
Calcium oxalate crystals	2	40%	3	60%	100%
Fatty acid cylinder	0	0	1	100%	100%
Monohydrate calcium	1	100%	0	0	100%
Hyaline cylinder	1	50%	1	50%	100%
Leucine	0	0	1	100%	100%
Calcium phosphate crystals	0	0	1	100%	100%

Based on the results of urine sediment examination in patients with hypertension, it was found that amorphous urate was more in women, 55.6% than in men, 44.4%, 66.7% of uric acid crystals were more in women than in men, 33.3%, ammonium biuret. obtained in men 50% and women 50%, calcium oxalate crystals are found more in women 60% than in men 40%, fatty acid cylinders are only found in women 100%, while monohydrate calcium is only found in men 100%, cylinder hyaline in men 50% and women 50% and leucine only found in women 100%.

Table 6. Distribution of Urine Sediment Examination Results Based on Smokers

Urine Sediment	Smoker				Total
	Smoke		Do not smoke		
	Result	(%)	Result	(%)	
Amorphous veins	3	16.7%	15	83.3%	100%
Uric acid crystals	0	0	3	100%	100%
Ammonium biuret	1	50%	1	50%	100%
Calcium oxalate crystals	0	0	5	100%	100%

Fatty acid cylinder	0	0	1	100%	100%
Monohydrate calcium	0	0	1	100%	100%
Hyaline cylinder	1	50%	1	50%	100%
Leucine	0	0	1	100%	100%

Based on the results of urine sediment examination in patients with hypertension, it was found that amorphous urate was found to be more in respondents who did not smoke 83.3% than in respondents who smoked 16.7%, uric acid crystals were only found in respondents who did not smoke 100%, ammonium biuret in respondents who smoking 50% and those who do not smoke 50%, calcium oxalate crystals are only found in respondents who do not smoke 100%, fatty acid cylinders are only found in respondents who do not smoke 100%, monohydrate calcium is only found in respondents who do not smoke 100%, hyaline cylinders found in respondents who smoke 50% and who do not smoke 50% and then leucine is only found in respondents who do not smoke 100%.

DISCUSSIONS

Based on the results of research on the image of urine sediment in hypertensive patients using microscopic methods carried out at Kabila Public Health Center with a total of 28 samples, it was found that the results of the examination were more than 64.3% amorphous uricine sediment compared with 17.9% calcium oxalate crystal urine sediment, sediment. uric acid crystal urine 10.7%, ammonium biuret urine sediment 7.1%, hyaline cylinder urine sediment 7.1%, fatty acid cylindrical urine sediment 3.6%, calcium monohydrate urine sediment 3.6%, leucine urine sediment 3 , 6% and the last type of urine sediment is calcium phosphate crystal 3,6%.

Hypertension can cause damage to the epithelial cells of the arterial intima which results in or stimulates atheclorosclerosis and thrombus, while the target organs affected are the heart, brain, kidneys and eyes, and urine sediment is one of the tests that can indicate kidney disorders [12] . Urine sediment itself, many types of normal urine sediment in the urine and abnormal sediments that can indicate some disturbance in the body.

Amorphous urate sediment itself is included in the elements of inorganic urine sediment, which is urate found in urine with an acidic pH. The presence of inorganic forms of urine sediment such as amorphous does not mean that this is because this sediment has nothing to do with the presence of urinary stones but is a normal metabolic waste product in the urine which is influenced by the type of food eaten, the amount of food eaten , metabolic rate and urine pH itself [4]. Hypertensive patients who have a urine pH below normal, namely an acidic pH of 65.9% and 34.1%, who have a pH above normal, namely alkaline pH, but there is no relationship between acidic urine pH and hypertension where acidic urine pH is influenced by eating food which are high in protein. High protein intake can significantly reduce urine pH through increased urinary excretion. This is because foods high in protein are a source of the amino acids cysteine and methionine which produce hydrogen ions which can lower urine pH [19].

The type of cylindrical urine sediment itself is formed from cells that are elongated and have rounded ends and are an indication of acute and chronic kidney function impairment [9]. Cylindrical urine sediment if found in urine can be an indication of kidney problems where usually hypertensive patients can experience complications and attack the kidney organs [5]. Cylinders can also indicate renal impairment especially in the

nephron, this is because these cylindrical urine sediments are formed in the distal convoluted tubule and the collecting duct [2]. From the explanation above, this is in accordance with the results of a study where out of 30 urine samples in chronic renal failure patients, 7 casts or cylinders were also found in the urine sample [5].

Ammonium biurate sediment itself is a urine sediment that is classified as inorganic urine sediment and is usually found in leachate urine. Metabolic syndrome patients (a group of concomitant health problems including hypertension) found 22.1% ammonium urate (biurat). Ammonium urate (biurate) is usually a sediment found in urine with an acidic pH but the formation of ammonium urate (biurat) can be caused by a combination of several factors including decreased urine volume or conditions that make the urine alkaline such as a vegetarian diet, urinary tract infections and also who suffer from gout [17].

*Monohydrate calcium*is another form of calcium oxalate crystals, the crystals themselves are formed due to the concentration of urine which is related to the metabolism of food consumed by a person and fluid intake and the impact of changes in pH in urine which can change the solubility of salt in urine resulting in crystal formation [3]. This is consistent with previous studies where the food and drink consumed is very influential, resulting in crystal formation, where 29% of people who consumed pumped well water were found calcium oxalate crystals in their urine [7]. Then, people who often consume coffee 20.59% found positive calcium oxalate crystals 1 and 11.76% found positive calcium oxalate crystals 2 [15].

The type of leucine urine sediment is asmino acid, the presence of a lot of amino acids in the urine can form crystals and can indicate kidney damage because large molecules such as amino acids are not filtered in the kidneys which can indicate that nephron filtration has decreased function [4]. Previous research results obtained in urine samples of hypertensive patients were positive for protein (proteinura) [11].

Calcium phosphate crystals are themselves an angorganic element which is usually present in leachate urine and can cause urinary tract stones [4]. There is a relationship between urinary tract stones and hypertension [8], in contrast to other studies which say that hypertension is not a risk factor for urinary tract stones, this is because urinary tract stones are multifactorial diseases or can be caused by many factors [16], this is the same as other researchers who say that there is no relationship between urinary tract stones and hypertension [1]. So calcium phosphate crystal sediments can be in the urine not because of urinary tract stones but because of consuming foods that contain lots of phosphorus which is usually found in food items such as meat, grains and milk. Eating foods that contain large amounts of phosphorus so that they exceed the normal limit of 1500 mg per day can interfere with the metabolism of calcium homeostasis. High phosphorus intake without being balanced with high calcium intake causes the ratio of phosphorus to calcium to increase, thereby causing an increase in parathyroid hormone. An increase in the amount of parathyroid hormone in the blood causes an increase in bone resorption thereby increasing the amount of calcium in the blood so that it is excreted in the urine [14].

From the results of the examination, it was found that some abnormal urine sediment was found, the abnormal sediment results could also be influenced by several reasons, namely when the sample after being in the centrifuge the sediment was left at the bottom of the tube, then the microscope light was too

bright causing the fine elements not to be seen, the next cause namely the tools used such as (microscope, slide and deckglass) are less clean so that it can be mistaken for urine sediment and the most common cause is the lack of skills in observing sediment where in this study using the microscopic method, namely observing using the eye using a microscope .

Factors that can aggravate hypertension are age, and age is very influential on hypertension, naturally blood pressure in children is lower than blood pressure in adults. This blood pressure will increase with age, people aged 40 years are usually susceptible to increased blood pressure which can gradually become hypertension as they get older [10], this is the same as the results of a study where respondents with the age category> 40 years 82.1% more than the age category <40 years 17.9%.

The second factor, namely gender, is also very closely related to the occurrence of hypertension, where in youth and middle age <40 years, hypertension is higher in men, this is because in youth men do more activity than women and in women. higher after the age of> 40 years, this is because it has entered the monopouse period where there is no estrogen hormone [10].

Another factor that can worsen hypertension is smoking. In cigarettes themselves contain nicotine which will cause an increase in blood pressure because nicotine will be absorbed by small blood vessels in the lungs and circulated by blood vessels to the brain, the brain reacts to nicotine by giving signals to the adrenal glands to release epinephrine (adrenaline). This powerful hormone constricts blood vessels and forces the heart to work harder due to higher pressure. In addition, the carbon dioxide in cigarette smoke replaces oxygen in the blood. This will result in blood pressure because the heart is forced to pump to get enough oxygen to the organs and tissues of the body [10].

CONCLUSION

From the results of the study, the description of urine sediment in hypertensive patients can be concluded that:

1. The results of urine sediment examination in hypertensive patients in the Kabila Health Center work area in 2020, there were 5 abnormal urine sediments and 4 normal urine sediments.
2. a. Amorphous urate sediments, uric acid crystals, ammonium biuret, calcium oxalate crystals, fatty acid cylinders, calcium monohydrate, hyaline cylinders, leucine and calcium phosphate crystals were found.
   b. The type of abnormal urine sediment that mostly appeared in the urine of hypertensive patients was uric acid crystals of 10.7%.
   c. Risk factors that cause abnormal urine sediment are age where the most respondents are in the age category> 40 years 82.1%, where there are abnormal sediments of 100% uric acid crystals, 100% fatty acid cylinders, 50% hyaline cylinders, 100% leucine and crystals. 100% calcium phosphate. The second factor is gender where the most respondents are female gender 60.7 where there are abnormal sediments of 66.7% uric acid crystals, 100% fatty acid cylinders, 50% hyaline cylinders, 100% leucine and calcium crystals phosphate 100%. The next factor is smokers where most respondents do not smoke 78.6%, where there are abnormal sediments of 100% uric acid crystals, 100% fatty acid cylinders, 100% hyaline cylinders, 50% leucine and 100% calcium phosphate crystals.

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