IMAGES OF UREUM LEVELS IN PATIENTS WITH LUNGER TUBERCULOSIS WHO ARE UNDERING INTENSIVE PHASE TREATMENT IN PUSKESMAS, NORTH CITY

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ABSTRACT

Tuberculosis cases in Gorontalo city have reached 732 cases. Treatment of tuberculosis patients by applying antibiotics which are thought to have side effects on the kidney organs. One such antibiotic is rifampin which causes essential nephritis or inflammation of the kidneys.

The purpose of this study was to describe urea levels in tuberculosis patients undergoing intensive phase treatment. The research method is quantitative descriptive research. The population was 45 people with pulmonary tuberculosis who underwent intensive phase treatment at Puskesmas Kota Utara, with a total sample of 10 people. The data analysis technique was processed through the IBM SPSS V 25.0 program.

The results showed that urea levels of pulmonary tuberculosis patients were 80.0% normal and 20% increased. It was concluded that the urea level of tuberculosis patients who underwent intensive phase treatment had increased, not due to the consumption of OAT but due to external factors. It is recommended that patients with pulmonary tuberculosis check the level of urea after undergoing treatment, especially patients with elderly people.

Keywords: Ureum, Pulmonary TB, Intensive

INTRODUCTION

Tuberculosis (pulmonary TB) is an infectious disease caused by bacteria in the form of rods (bacilli) known as Mycobacterium tuberculosis. Transmission of this disease through the intermediary of saliva, sputum or patient droplets containing bacteria that can enter the human body through the respiratory tract. When coughing or sneezing, the patient spreads germs into the air in the form of sputum sparks (droplet nuclei). One cough can produce about 3000 sputum sparks and will be easily infected by other people who have decreased immunity [1].

According to WHO (2018), in Indonesia there was an increase in TB cases from 331,703 in 2015 to 563,879 cases in 2018 including an increase of 121,707 cases between 2017 and 2018 [2]. According to data from the Indonesian Ministry of Health (2018), there was an increase in cases from 2014 to 2018. In 2014 324,539 cases were found and in 2018 566,623 cases of tuberculosis were found. According to the Ministry of Health of the Republic of Indonesia (2018), Gorontalo Province has 310 cases per 100,000 populations. From the total number of tuberculosis cases in Indonesia [3]. Based on the results of basic health research (Riskesdas) (2018), Gorontalo Province occupies the 9th position with a prevalence of 0.42%.

The number of tuberculosis cases reported by the Gorontalo Provincial Health Office (2018), Gorontalo City took second place with the number of TB case findings being 375 cases. Based on data reported by the Gorontalo Provincial Health Office (2019), there has been an increase in tuberculosis cases with the city of Gorontalo still in second place with a total of 732 cases.

According to data from the North City Health Center (2019), there were 94 tuberculosis patients who were undergoing treatment. Patients undergoing Tuberculosis treatment at the North City Puskesmas come from various ages, starting from the age of 2-5 with 3 people, 2 people aged 6-11 years, 11 people 12-20 years old, 21-34 years old as many as 44 people, 21 people aged 35-45 years, 3 people aged 45-55 years, 5 people aged 56-65 years and 65 years old as many as people.

According to data from the North City puskesmas from January to August 2020, there were 45 tuberculosis patients who were undergoing treatment and came from various ages. Starting from the ages of 15-19 years as many as 3 people, ages 20-44 years as many as 18 people, ages 45-54 years as many as 10 people, ages 55-59 years as many as 3 people, ages 60-69 years as many as 9 people and aged 70 years as many as 2 people.

Tuberculosis treatment is carried out by administering anti-tuberculosis drugs (OAT). Tuberculosis treatment is divided into 2 phases, namely the initial / intensive phase for 2 months and the follow-up phase for 4 months. In the initial / intensive phase, it consists of 4 types of drugs, namely isoniazid, rifampin, ethambutol and pyrazinamide. The drugs used have side effects on the body, but the type of drug that can affect the kidneys is rifampin.

Rifampin is an oral antibiotic that has bactericidal activity against Mycobacterium tuberculosis. The mechanism of action of rifampin is by inhibiting the action of the DNA-dependent RNA polymerase enzyme which causes the synthesis of RNA microorganisms to be inhibited and as a key component in any treatment regimen. Rifampin is always included unless there is contraindication, rifampin, which is one of the antibiotics that causes interstitial nephritis, which is inflammation of the kidney cells. Nephritis is inflammation of the kidneys that occurs due to bacterial infection of the nephrons. These bacteria enter through the respiratory tract and then are carried by the blood to the kidneys. Because of this infection, the nephrons become inflamed so that the protein and blood cells that enter the primary urine cannot be filtered and come out with the urine. Other than that,

Impaired kidney function can occur apart from being caused by drug consumption, there are several factors that can affect it, such as nutrition and age. In old age there will be a decrease in body function. When there is a decrease in body function, the working mechanism of the body organs will be disrupted as well as the kidneys. Then for nutrition itself, if you consume too many foods that contain protein and are not balanced with other nutrients, the kidneys will work harder to process the products that enter the organs.

Kidney function tests can be done by measuring the levels of urea. Ureum is a byproduct of metabolism (protein burning). Under normal circumstances, blood urea levels are always constant. If there is overproduction, for example the food we eat is too high in protein, the kidneys will work hard to get it out of the body. However, if there is damage to the kidneys, there will be a buildup of urea in the blood. The kidneys are then unable to get rid of the urea, so the levels get higher. Other conditions such as dehydration (lack of body fluids due to diarrhea,

excessive sweating and not drinking) will also cause high levels of urea in the blood [5].

In a previous study by Syahida and Meli 2019 with the title Study of Ureum and Uric Acid Examination Results in Pulmonary Tuberculosis Patients Who Consume Intensive Phase Anti-Tuberculosis (OAT) Drugs at Puskesmas Jumpandang Baru and Puskesmas Barabaraya, urea examination results have increased by 5 (16.67%) samples. and 25 (83.33%) samples showed normal urea levels and the uric acid examination results were increased by 18 (60.0%) samples and 12 (40.0%) samples showed normal uric acid levels.

The reason the researchers took this research topic was because researchers wanted to see a picture of urea levels in tuberculosis patients who consumed OAT as it is known that long-term drug consumption can cause kidney problems. This makes researchers interested in taking research on the description of urea levels in tuberculosis patients who consume OAT intensively.

RESEARCH METHODS

This research is included in the type of quantitative research using a quantitative descriptive research design, which describes urea levels in patients with pulmonary tuberculosis who undergo intensive phase treatment at the North City Health Center. This research was conducted from 26 October to 10 November 2020, the sampling location was at the North City Health Center and for the location of the sample examination was carried out at the UPTD Regional Health Laboratory Center of Gorontalo Province. The tools and materials used at the time of the research, namelymicropipette10 µl, 1000 µl micropipette, yellow tip, blue tip, 5010 photometer, test tube, tube rack, alcohol swab, patient serum, urea reagent, aquadest. Sampling using purposive sampling technique with a total sample of 10 patients with pulmonary tuberculosis who underwent intensive phase treatment in North City Puskesmas. Data were analyzed using univariate analysis and processed with Statistical Package for Social Science (SPSS).

RESEARCH RESULT

Based on research that has been carried out on samples of pulmonary tuberculosis patients who are undergoing intensive phase treatment, 2 samples with urea levels increased from 10 samples as shown in Table 1.

Table 1. Results of examination of urea levels of pulmonary tuberculosis patients undergoing intensive phase treatment at the North City Health Center

Result	Frequency	%
Normal	8	80
To increase	2	20

Based on table 1.The frequency distribution of pulmonary tuberculosis patients based on the results of urea level examination, Normal urea levels were 8 patients with a percentage of 80%. The urea levels increased by 2 patients with a percentage of 20%.

Table 2. The frequency distribution of pulmonary tuberculosis patients is based on factors that influence urea levels

Factors affecting urea levels			Frequency	%
	Yes	Not		
Consuming OAT	Yes		10	100
Eat foods that contain protein	Yes		10	100
Suffering from another disease		Not	10	100
Consuming alcohol		Not	10	100
Elderly	-	-	2	20

Based on table 1, the frequency distribution of pulmonary tuberculosis patients based on factors that influence urea levels, 10 patients with 100% of anti-tuberculosis (OAT) consumed, 10 patients consumed protein-containing foods with 100% percentage, did not suffer from other diseases. as many as 10 patients with a percentage of 100%, do not consume alcohol as many as 10 patients with a percentage of 100% and patients with elderly Pulmonary Tuberculosis as many as 2 patients with a percentage of 20%.

DISCUSSION

Based on research conducted at the UPTD Regional Health Laboratory of Gorontalo Province, the results of the urea level examination of pulmonary tuberculosis patients undergoing intensive phase treatment were 8 samples in the normal category with a percentage of 80% and 2 samples in the increased category with a percentage of 20%. This indicates that more examination results are in the normal category than in the category of increased urea levels.

The increase in urea levels was seen from the results of the examination which exceeded normal limits. The normal value of urea levels is 15-40 mg / dl. When the level of urea exceeds the predetermined normal limit, it can indicate impaired kidney function. If the level of urea in the blood is high, it is called uremia. Sources of high protein in food can be found in eggs, milk, meat, all types of nuts including processed products such as tempeh and tofu which also triggers an increase in urea levels in the blood, while a decrease in urea levels can be caused by hypervolemia (overhydration), liver damage caused by weight, low protein diet, malnutrition, pregnancy and prolonged intravenous glucose supplementation as well as phenothiazine drug consumption [6].

According to previous researchers, the increase in Urea in patients with pulmonary tuberculosis was due to anti-tuberculosis drug treatment. Consumption of fixed dose combination OAT consisting of isoniazid (H), Rifampin (R), Pyrazinamide (Z), and Ethambutol (E) is given every day regularly for 2 month (2HRZE) in the intensive phase. Therefore, it is necessary to have a form of direct supervision by the supervisor of taking medication (PMO) to ensure patient compliance with ingestion of drugs, usually infectious patients become non-contagious within 2 weeks. Most of the smear positive lung TB patients became smear negative (conversion) within 2 months. The duration of OAT treatment has tormenting side effects for sufferers, including minor effects, namely itching, redness of the skin, reddish urine, burning sensation in the legs, joint pain to major effects, namely kidney failure [4].

Rifampin is a type of drug that can cause kidney dysfunction. Rifampicin can inhibit the action of the DNA-dependent RNA polymerase enzyme which results in inhibited RNA synthesis. Rifampin can also trigger essential nephritis or inflammation of the kidney cells. Inflammation of the kidneys results from bacterial infection of the nephrons. Bacteria that enter the body through respiration will be carried by the blood to the kidneys. Infection that occurs due to bacteria causes the nephrons to become inflamed so that protein and blood cells that enter the primary urine cannot be filtered and excreted with urine.

Previous research stated that the increase in urea levels in patients with pulmonary tuberculosis was not influenced by anti-tuberculosis drug therapy (OAT) because OAT administration was based on clinical needs as seen from the diagnosis. Increased levels of urea in tuberculosis patients can be influenced by several other factors such

as age, nutrition, consumption of alcoholic drinks [4].

Based on the results of the study, patients with age> 70 years experienced an increase in urea levels, while those aged 18-60 years did not experience an increase in urea levels (normal). This proves that the increase in urea levels in tuberculosis sufferers is not influenced by the drug therapy being undertaken but is influenced by external factors.

This is reinforced by previous research that, in old age, a person will experience changes in terms of physical, cognitive, and psychological life. Overall physical health condition has deteriorated since a person entered the elderly phase. This is marked by the appearance of various symptoms that have never been suffered at a young age [7].

This study is in line with previous studies where the intensive phase of anti-tuberculosis drug therapy had no effect on the kidneys. During drug therapy there will be an increase in urea levels but if the treatment has been completed and the drug therapy is immediately stopped, the urea levels will immediately decrease unless the patient has a history of kidney disease.

CONCLUSION

Based on the research that has been conducted on "Ureum Levels in Patients with Pulmonary Tuberculosis who Underwent Intensive Phase Treatment at the North City Health Center", it can be concluded:

1. The results of examining urea levels in tuberculosis patients undergoing intensive phase treatment showed that the normal sample was 80% and the sample increased by 20%.
2. The external factor that causes the increase in urea levels in tuberculosis patients undergoing intensive phase treatment is age.

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