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Description of Uric Acid Levels and Blood Pressure In Pulmonary Tuberculosis Patients Consuming Anti Tuberculosis Drug (ATD) in the Working Area of Sakra Public Health Center

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ABSTRACT

Background: Anti-tuberculosis (ATD) used is the standard blend of INH, PAS and streptomycin for one to two years. The amino salylic (pas) acids are then replaced with pirazinacids. Pirazinbacteria is a drug that can cause increased levels of uric acid in the body (hyacinth). Hiperurisemia is the state of concentration of the veins in the plasma or the serum has exceeded the limit of the monosodium ligament of 7.0 milligrams /dl. Hyperuricemia is also cited as an important risk factor for hypertension and other cardiovascular diseases. Research purposes: For details of uric acid and blood pressure on lung tuberculosis patients who use antituberculosis (oats) in the region of the sakra hospital. Research methods: The kind of research used I s a descriptive observation study with a sectional design, a study in which dependent and independent variables are done and measured simultaneously. The sample retrieval technique on this study USES a total sample using the criteria the researchers have chosen in selecting a sample. Research: Average uric acid and blood pressure in lung tuberculosis patients who consume single-month intensive drugs (ATD) are 7,8 mg/dl and 121/75 mmHg. Average levels of uric acid and blood pressure in lung tuberculosis patients who use 2 months of intensive phase (ATD) are 9,1 mg/dl and 129/78 mmHg. Conclusion: There are high levels of uric acid and blood pressure in those with lung TB who take anti-tuberculosis drugs (ATD).

INTRODUCTION

Tuberculosis is an infectious disease caused by TB germs (*Mycobacterium Tuberculosis*). Most TB germs attack the lungs, but can also affect other organs. Control of Tuberculosis (TB) in Indonesia has been going on since the Dutch colonial era but was limited to certain groups. After the war of independence, TB was managed through the Lung Disease Treatment Center (BP-4). Since 1969 control has been carried out nationally through the public health center. The anti-tuberculosis drug (ATD) used is a standard combination of INH, PAS and Streptomycin for one to two years. Para Amino Salicylic Acid (PAS) was later replaced with Pyrazinamide. Since 1977, short-term ATD combinations have been used consisting of INH, Rifampicin, Pyrazinamide and Ethambutol for 6 months. Indonesia is ranked 2nd with the highest TB sufferers in the world after India. (Kemenkes RI, 2020).

West Nusa Tenggara Province in 2020 reported that the total number of TB patients (all types) reached 5,430 people, the number of all TB cases was found more in men by 59.7% or 3,239 people (Dinas Kesehatan Prov. NTB, 2021). East Lombok Regency in 2020 there were

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1,135 new cases of AFB+ pulmonary TB, consisting of 641 cases of men (56.5%) and 494 cases of women 43.5%. (Dikes Lombok Timur, 2020). Several efforts have been made by the East Lombok Health Office in efforts to prevent and treat TB in order to break the chain of transmission of Tuberculosis. The therapy used to cure pulmonary tuberculosis is known as Anti Tuberculosis Drug Therapy (ATD). (Dikes Lombok Timur, 2020

Anti Tuberculosis Drug (ATD) is a combination of several types of drugs, namely, isoniazid, rifampicin, pyrazinamide, ethambutol and streptomycin in sufficient quantity and at the correct dosage according to the treatment category. This is to prevent the emergence of immunity to ATD. TB treatment is given in 2 stages, namely the intensive and advanced stages. Tuberculosis patients receive treatment using ATD. Some anti-TB drugs have hepatoxic side effects on the body. (Mongan & Wowor, 2016).

The combination of types of drugs used by the East Lombok District Health Office for the TB control program are, isoniazid, rifampicin, pyrazinamide, ethambutol and streptomycin in sufficient quantities and in the right dose according to the treatment category. (Dikes Lombok Timur, 2020) Pyrazinamide is a drug that can cause an increase in uric acid levels in the body. According to (Dostanko, 2018), attacks tend to involve the joints of the lower extremities, especially the ankles and first metatarsophalangeal joints. Pre-treatment hyperuricemia (uric acid ≥6.8 mg/dL) was found to be an independent risk factor for gout attacks after anti-TB treatment.

Hyperuricemia is a state in which the concentration of urate in plasma or serum exceeds the solubility limit of monosodium urate, which is 7.0 mg/dl. Hyperuricemia can be defined in relation to the risk of experiencing a disease. The risk of developing gout or urolithiasis increases with urate concentrations greater than 7.0 mg/dl. Pyrazinamide is one of the causes of decreased excretion of uric acid so that uric acid levels in serum exceed normal limits. (Wiraputra, 2017).

Hyperuricemia is also referred to as an important risk factor for hypertension and other cardiovascular diseases. studies show that hyperuricemia plays an important role in the occurrence of cardiovascular morbidity in the general population, hypertensive patients, type 2 DM, and patients with heart and vascular diseases (Miettinen et al., 1998). The relationship between hyperusmia and hypertension is further strengthened by experiments conducted by (Heinig & Johnson, 2006) on rat animal trials. The experiment showed an increase in rat blood pressure, 3-5 weeks after their uric acid levels were increased by administering oxonic acid.

METHODS

This research is descriptive observational with a cross sectional design with a total sample of 28.

RESULTS AND DISCUSSION

Results of Examination of Uric Acid Levels and Blood Pressure in Pulmonary Tuberculosis Patients Consuming Anti-Tuberculosis Drugs (ATD) Treatment for 1 Month in the working area of the Sakra Public Health Center.

Table 1. Examination results of uric acid and blood pressure in patiens taking anti tuberculosis drugs for 1 month

No.	Sampel code	gender	Uric acide levels (mg/dl)	Blood pressure levels (mmHg)	Uric acids inform	Blood pressure inform
1	A01	M	7,5	130/75	High	High

2	A02	M	8,1	120/60	High	Normal
3	A03	M	9,2	140/90	High	High
4	A04	M	7,5	130/60	High	High
5	A05	M	7,2	110/65	High	Normal
6	A06	F	9,7	140/95	High	High
7	A07	F	5,6	100/60	Normal	Normal
8	A08	M	6,1	110/65	Normal	Normal
9	A09	M	7,9	100/60	High	Normal
10	A10	F	8,3	120/90	High	High
11	A11	F	7,6	130/80	High	High
12	A12	F	6,3	100/60	Normal	Normal
13	A13	M	8,4	120/95	High	Normal
14	A14	M	9,6	140/90	High	High
Average			7,8	121/75		

Source : Primary Data 2021

The table above shows that there was an increase in uric acid levels in 11 respondents (78%) and blood pressure increased in 7 samples (50%) while the other 7 samples (50%) were normal. The table above shows that there was an increase in uric acid levels in 11 respondents (78%) and blood pressure increased in 7 samples (50%) while the other 7 samples (50%) were normal.

Table 2. Examination results of uric acid and blood pressure in patiens taking anti tuberculosis drugs for 2 month

No.	**Sampel Code**	**Gender**	**Uric Acid levels (mg/dl)**	**Blood Pressure levels (mmHg)**	**Uric acids inform**	**Blood pressure inform**
1	A01	F	8,0	130/60	High	High
2	A02	F	9,8	130/80	High	High
3	A03	M	15,2	140/90	High	High
4	A04	M	10,2	130/70	High	High
5	A05	F	8,7	140/85	High	High
6	A06	F	9,5	130/80	High	High
7	A07	F	9,2	130/75	High	High
8	A08	M	6,5	110/65	Normal	Normal
9	A09	M	8,6	130/90	High	High
10	A10	F	7,9	130/75	High	High
11	A11	F	9,3	140/90	High	High
12	A12	F	6,2	100/60	Normal	Normal
13	A13	M	9,7	140/80	High	High
14	A14	M	8,8	130/90	High	High
Average			9,1	129/78		

Source : Primary Data 2022

From the table above shows that. Increased levels of uric acid were found in the majority of respondents, totaling 12 samples (85.7%) and 2 samples (14.3%) under normal

circumstances, as well as increased blood pressure in 12 samples (85.7%) and as many as 2 samples (14.3%) had normal blood pressure.

DISCUSSION

Based on the results of the study, it was found that most of the respondents had high uric acid levels (hyperurisemia). High uric acid levels are one of the side effects of anti-tuberculosis drug therapy (ATD), namely pyrazinamide. Pyrazinamide will be converted into active pyrazinoic acid by the pyrazinamidase enzyme which then undergoes hydroxylation into hydropyrazinoic acid which will affect glomerular filtration and cause changes in activity and ion transport in the proximal tubules so that several proximal tubular functions are disrupted. If the function of the proximal tubule is disturbed, the excretion of uric acid in the body will also be disrupted and cause hyperuricemia.

This is in line with the research of Ghinasari (2017) and Kondo et al. (2016) which found uric acid levels tended to increase where research was carried out by Ghinasari at the Lubuk Buaya Health Center Padang, Nanggalo Padang, Ambaca. This is in line with the research of Ghinasari (2017) and Kondo et al (2016) found uric acid levels tended to increase where research was carried out by Ghinasari at the Lubuk Buaya Padang Health Center, Nanggalo Padang, Ambaca Padang and Alai padang stated that there was an increase in uric acid levels in 39 samples (100%). The average uric acid level of patients from week 4 to week 8 of treatment was 11.51 mg/dl and week 9 to week 12 was 9.07 mg/dl. Meanwhile, the research conducted by Kondo et al at Prof. Hospital. Dr. R. D. Kandou Manado said that 36 hyperusmias were found in 36 samples.

Based on this research, it was also found that the respondent's blood pressure tended to increase after uric acid increased. Hypertension occurs because uric acid causes renal vasoconstriction through a decrease in the nitrite oxidase enzyme in the capillary endothelium, resulting in system activation. Increased uric acid in humans is also associated with endothelial dysfunction and renin activation.

Increased serum uric acid stimulates the production of cytokines, including MCP-1, interleukin-1, interleukin-6, tumor necrosis factor-α (TNF-α), and c-reactive protein (CRP). These cytokines trigger systemic inflammation. Increased CRP decreases NO production which reduces the ability of vascular vasodilators. In addition, an increase in serum uric acid causes an increase in the activity of the renin-angiotensin-aldosterone system, causing vasoconstriction.

Normal gout occurs because of the respondent's lifestyle, the results of the interview say that the respondent pays attention to diet and regular light exercise. Doing physical activity can reduce pain due to gout. In addition, exercise coupled with a healthy diet can help you lose and maintain ideal body weight. It should be noted that losing weight can reduce uric acid levels in the blood. In this condition it can also make blood flow smoother and blood pressure become more controlled.

CONCLUSION

The number of Pulmonary Tuberculosis Patients who consumed Anti Tuberculosis Drugs (OAT) intensive phases of 1 month and 2 months was 28 samples, the average level of uric acid is 7.8 mg/dl and blood pressure is 121/75 mmHg in pulmonary tuberculosis patients taking intensive phase 1 month anti-tuberculosis drugs (ATD), the average level of uric acid was 9.1 mg/dl and blood pressure was 129/78 mmHg in pulmonary tuberculosis patients who were

taking anti-tuberculosis drugs (ATD) for an intensive phase of 2 months, there was an increase in uric acid levels and blood pressure in tuberculosis patients who consumed intensive phases of anti-tuberculosis drugs (ATD) for 1 month and 2 months in the work area of the Sakra Health Center.

REFERENCES

1. Dinkes Lombok Timur. (2020). Profil kesehatan kabupaten lombok timur http:dinkes.lomboktimurkab.go.id
2. Dinkes NTB. (2021). Profil kesehatan provinsi nusa tenggara barat. https://dinkes.ntbprov.go.id/
3. Dostanko, V., Yagur, V., Apanasovich, V., Dostanko, N., & Rekun, A. (2018). *FRI0253 Trends for gout in adults in an urban area for a 5-year period: incidence, prevalence and hospitalisation rates*. *7*, 666.2-667. https://doi.org/10.1136/annrheumdis-2018-eular.5549
4. Heinig, M., & Johnson, R. J. (2006). Role of uric acid in hypertension, renal disease, and metabolic syndrome. *Cleveland Clinic Journal of Medicine*,*73*(12), 1059–1064. https://doi.org/10.3949/ccjm.73.12.1059
5. Kemenkes. Ri. (2020). Profil kesehatan indonesia. Kementrian Kesehatan Indonesia.https://www.kemkes.go.id/downloads/resources/downloa d/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-IndonesiaTahun-2020.pdf
6. Kementrian Kesehatan, R. (2011). Modul penggunaan obat rasional. http://farmalkes.kemkes.go.id/unduh/modul-penggunaan-obatrasional/
7. Miettinen, H., Lehto, S., Salomaa, V., Mähönen, M., Niemelä, M., Haffner, S. M., Pyörälä, K., & Tuomilehto, J. (1998). Impact of diabetes on mortality after the first myocardial infarction. *Diabetes Care*, *21*(1), 69–75. https://doi.org/10.2337/diacare.21.1.69
8. Mongan, A. E., & Wowor, M. F. (2016). *Gambaran berat jenis urin pada pasien tuberkulosis paru dewasa*. *4*.
9. Wiraputra, I. B. (2017). *Gouth arthritis.* Bali: Universitas Udayana
10. Wulandari, A. A. (2015). Faktor Risiko dan Potensi Penularan Tuberkulosis Paru di Kabupaten Kendal, Jawa Tengah. *Jurnal Kesehatan Lingkungan Indonesia*, 7-13.