

## THE RELATIONSHIP BETWEEN SIDE EFFECTS OF TUBERCULOSIS DRUG USE AND SGOT/SGPT VALUE OF INTENSIVE PHASE PATIENTS

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### ABSTRACT

Tuberculosis is an infectious disease caused by the bacteria *Mycobacterium Tuberculosis* which has a rod shape and is acid-resistant. The prolonged consumption of anti-tuberculosis drugs can cause serious side effects. Side effects from the consumption of anti-tuberculosis drugs, namely the risk of hepatotoxicity, which is marked by an increase in the SGOT / SGPT value. This study aimed to determine the relationship between the duration of use, dosage and side effects of anti-tuberculosis drugs in tuberculosis patients, which had an effect on the SGOT / SGPT value at RSI Sultan Agung Semarang. This research is an analytical observational study with a cross-sectional design. The sample was 96 patients, and data collection was carried out in January-November 2020 at RSI Semarang. The instrument used in this study was patient medic record data. This study uses the Chi-Square test. The Chi-Square test results in 0.000 ( $p < 0.05$ ) so that it could be stated that there was a relationship between the use and side effects on the SGOT / SGPT value.

**Keywords:** Tuberculosis; Intensive phase; SGOT/SGPT value

## 1. INTRODUCTION

Tuberculosis is an infectious disease caused by infection with the *Mycobacterium tuberculosis* bacterium. According to WHO (2015), countries with the largest prevalence in the world with tuberculosis sufferers include India, Indonesia and China, which each has a percentage of 23%, 10% and 10%. Indonesia ranks second with the most tuberculosis patients after India. Prevention of pulmonary tuberculosis is necessary to control the spread of the disease. One of the controls for pulmonary tuberculosis is adherence to the treatment (Prameswari, 2018). The estimates of new cases of TB patients every year are around 1/3 of patients in the public health center, 1/3 in hospital services or private and state clinics, and the rest are in other health service units (Sari, 2018). This study focuses on the side effects of using tuberculosis drugs on the value of SGOT/SGPT in the Intensive Phase.

According to data from Central Java Province, the number of cases is 14,139 people, and Semarang has 3,333 infected cases. Based on the spread of pulmonary TB disease, it is necessary to control it by following health procedures and compliance with health provisions given to patients with pulmonary TB (Kemenkes RI, 2011).

Compliance with the treatment of pulmonary TB patients by taking drugs regularly is very important because the resistance of tuberculosis bacteria to Anti Tuberculosis Drugs (OAT) can be widespread and minimize the occurrence of side effects of drug use. If there is non-adherence to treatment, it can cause the treatment process to fail, so it can increase the spread of pulmonary TB disease. Patients with pulmonary TB resistance can be infectious to those around them. This condition can worsen the condition of controlling the spread of pulmonary TB disease (Depkes

RI, 2016). The use of anti-tuberculosis drugs in the long term can have side effects on the body. The severe side effect of using this anti-tuberculosis drug is the risk of hepatotoxicity. There are three tuberculosis drugs that cause hepatotoxicity. They are pyrazinamide, isoniazid, and rifampin. Hepatotoxicity from the use of OAT can cause extensive and permanent liver injury. This can also cause death if it is not detected early in treatment which is marked by an increase in the SGOT/SGPT value called hepatotoxic (Lomanorek & Assa, 2016). Liver function abnormalities can occur if the SGOT value is greater than 2-3 times the normal limit (Eko, 2018). While SGPT is an enzyme that functions as a catalyst for body functions, liver cells are damaged due to viral or other disorders. There will be a release of SGPT enzymes from the liver cells into the blood (Tanoeisan et al., 2016).

According to Eko (2018), the factors that cause side effects are the duration of tuberculosis therapy and the dose of the drug given. Tuberculosis therapy time is long enough to cause drug side effects ranging from mild to severe (Musdalipah et al., 2018). Many studies on side effects in tuberculosis patients have been carried out but have not based on the mild and severe use of drugs in the intensive phase on the SGOT/SGPT values. This study aimed to find out the side effects between using drugs in the intensive phase and the value of SGOT/SGPT in Tuberculosis patients.

## 2. METHOD

This study aimed to determine the relationship between the side effects of drug use and the value of SGOT/SGPT in Intensive Phase Tuberculosis patients. The study obtained ethical and research committee licenses at the Semarang Islamic Hospital with the number 38/EC/KEPK/2020. An analytical observational design method with cross-sectional was employed in this study. Prospective data collection was carried out by showing treatment data, SGOT SGPT values from medical records of patients undergoing outpatient treatment at the Semarang Islamic Hospital. The subjects of this study were Tuberculosis patients at the Semarang Islamic Hospital who had met the inclusion criteria. The inclusion criteria of patients included patients aged 17-25 years and 26-46 years, patients who had used tuberculosis drugs for 2 months, and those who received SGOT/SGPT laboratory results. At the same time, the exclusion criteria for patients included: patients who were pregnant or breastfeeding, patients with complications of HIV/AIDS, or who had been given hepatoprotector therapy.

## 3. RESULTS AND DISCUSSION

The results of the study are presented in **Table 1**, which shows a relationship between the side effects of the use of tuberculosis drugs and the value of SGOT/SGPT in the Intensive Phase. Based on the results of the study, there were 96 patients with pulmonary tuberculosis in the intensive phase in the use of tuberculosis drugs. Sampling was carried out in the period January-November 2020 at Semarang Hospital.

**Table 1** shows that the female gender is 51 samples (53.1%). The sex of male 45 samples (46.9%) is smaller than female 51 (53.1%). A woman often stays at home with poor ventilation and lighting, causing carbon particles to settle in the lungs and weakening the body's resistance to disease, including pulmonary tuberculosis (Rokhmah, 2013). Meanwhile, according to research by Dasopang et al (2020), it states that the number of male patients is greater than that of women because men have a bad lifestyle, smoking habits which can cause the body's immune system to weaken, especially in the respiratory organs so that tuberculosis bacteria will easily attack. Age 46-65 years amounted to 58 (60.4%) and age 17-25 years 12 (12.5%), according to research by Andayani & Astuti (2017), it states that at the geriatric age, the function of the body's organs decreases, so that when Mycobacterium tuberculosis attacks it causes germs easily enter the body. From all samples in the intensive phase of TB, 94 patients experienced mild complaints during the use of TB drug therapy while 2 patients experienced severe side effects. Patients experienced

mild side effects such as nausea, vomiting, dizziness, difficulty sleeping, and lack of appetite. This can be treated with additional medical therapy to relieve complaints or temporarily stop previous treatment (Kemenkes RI, 2011). According to research by Rosyid et al (2019), it states that the highest number of tuberculosis patients are in the age range of 50 years (66.3%). The age factor is very influential on the incidence of mild to severe side effects on taking anti-tuberculosis drugs (OAT).

Table 2 shows that the use of Anti Tuberculosis Drugs for two months has normal SGOT/SGPT levels in 87 patients (100%) and abnormal (0%) patients, while > 2 months shows SGOT/SGPT levels normal values by 7 (77.8%) while 2 (22%) patients experienced an increase in SGOT/SGPT levels. This is because anti-tuberculosis drugs are taken for a long time, resulting in multilobular necrosis, accumulation of hepatotoxic metabolites, and liver damage as a sign of liver damage (Aminah, 2017). The research states that the results of SGOT levels of 54.7% exceed normal after treatment for >2 months. According to a study by (Erlangga, 2019), levels of the enzyme transaminase using anti-tuberculosis drugs have increased significantly. SGOT/SGPT enzyme levels in serum have increased due to enzymes normally found in liver cells entering the blood circulation.

**Table 1.** Distribution of Demographic Data of Pulmonary Tuberculosis Patients

Demographic Characteristics	Total	%
<b>Gender</b>		
Male	45	46.9%
Female	51	53.1%
<b>Age</b>		
17-25 YO	12	12.5%
26-45 YO	26	27.1%
46-65 YO	58	60.4%
<b>Health Insurance Status of Patients</b>		
GENERAL	42	43.8%
JKN NON PBI	54	56.3%
<b>Side Effects of</b>		
Mild	94	97.9%
Severe	2	2.1%

**Table 2.** The use of tuberculosis drugs on the value of SGOT/SGPT

Use of drugs		SGOT/SGPT		Total	P value
		Normal	Abnormal		
Use of drugs	2 Months	N	87	0	0.000
		%	100%	.0%	
	>2 Months	N	7	2	
		%	77.8%	22.2%	

**Table 3.** Side Effects of Drug Use on SGOT/SGPT values in Tuberculosis patients

Side Effects		SGOT/SGPT		Total	P value
		Normal	Abnormal		
Side Effects	Mild	N	94	0	0.000
		%	100%	0%	
	Severe	N	0	2	
		%	0%	100%	

In Table 3, mild side effects show normal SGOT/SGPT levels of 94 (100%), while severe side effects result in normal SGOT/SGPT levels of 0 (0%) and 2 (2.1%). According to research by Syaripudin (2014), it states that side effects occur due to tuberculosis treatment due to a race of patients belonging to rapid acetylators who tend to be prone to suffering from hepatotoxicity from the isoniazid drug. Mild side effects can be treated by giving symptomatic drugs, but if severe side effects need to be considered, other drugs should be considered. Research by

Seniantara (2018) shows that the milder the side effects by the patient, the higher the drug adherence, but the tuberculosis patient with severe side effects, the more severe drug adherence will be. Mild side effects include loss of appetite, nausea, stomach pain, tingling, and red urine. Tuberculosis patients have severe side effects such as visual disturbances, confusion, vomiting, or shock (Depkes RI, 2016). The results of this study indicate that there is a relationship between side effects of drug use and the value of SGOT/SGPT in patients with intensive phase tuberculosis with  $p$  value = 0.000 < 0.05.

#### 4. CONCLUSION

The results of this study indicate that there is a relationship between side effects of drug use and the value of SGOT/SGPT with  $p$  value = 0.000 < 0.05 in patients with the intensive phase of tuberculosis. For further researchers, the suggestions that can be given regarding the side effects of using tuberculosis drugs on the value of SGOT / SGPT in the advanced phase and the object of research is that the study is expected to be expanded and not limited to the addition of disease complications and additional therapy.

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#### 6. CONFLICT OF INTEREST

Information and data obtained must be kept confidential and not used for personal gain.

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