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Risk Factors Increased Levels of Serum Glutamate Oxaloacetate Transferase (SGOT) and Serum Glutamate Pyruvate Transferase (SGPT) in the Community In the District North Konawe

Hasan Nawir¹, Tasnim², Sanihu Munir²

¹ North Konawe District General Hospital, Indonesia

² Mandala Waluya University, Indonesia

Correspondence : hasannawir9@gmail.com

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ABSTRACT

Introduction: Based on data on the number of blood chemistry tests at the North Konawe Regency Regional General Hospital in 2019 amounted to 1,519 cases, an increase in 2020, namely 1,659 cases and an increase in 2020 to 2,264 cases. The purpose of the study was to analyze the risk factors for increasing SGOT and SGPT levels in the People of North Konawe Regency.

Method: This study used the Case Control Study approach. The population numbered 48 people. The Study Sample totaled 23 SGOT and SGPT improvement samples and 23 control samples. The sample technique in this study is Simple Random Sampling. The data was processed using the Data Normality Test (Kolmogrov Smirnov Test) Odds Ratio Test and logistic regression.

Result: The results showed that smoking or 2,769, alcohol consumption OR 6.476 and consumption of or drugs OR 5.312 against the increase in serum glutamate pyruvate transferase levels (SGPT) in The Community of North Konawe District. Regression tests showed that alcohol consumption was the most at-risk factor for increased levels of Serum Glutamate Oxaloacetic Transferase (SGOT) and Serum Glutamate Pyruvate Transferase (SGPT) in the People of North Konawe Regency.

Conclusion: Research shows that occupation, smoking habits, alcohol consumption and drug consumption are risk factors for increased levels of Serum Glutamate Oxaloacetic Transferase (SGOT) and Serum Glutamate Pyruvate Transferase (SGPT) in the people of North Konawe Regency.

Introduction

Hepatotoxicity of drug impact is the most frequent reason for drug withdrawals from the market in the United States and includes more than

50% of cases of acute liver failure. In the United States, about 2000 cases of acute liver failure and 50% of them are caused by drugs (39% Acetaminophen, 13% are idiosyncrasi reactions due to other drugs). Approximately 2-5% are

treated with icteric complaints and 10% of cases of acute hepatitis result from medications. About 75% of idiosyncratic reactions result in liver transplantation or death. Meanwhile, data on incidents internationally is not yet known.^[1]

One of the tests of liver function is Serum Glutamic Pyruvic Transaminase (SGPT) and Serum glutamic oxaloacetic transaminase (SGOT). This enzyme will come out of liver cells if liver cells are damaged so that it will naturally cause an increase in its levels in blood serum. SGPT is an enzyme that functions as a catalyst for various body functions. SGPT is considered more specific to assess liver damage than SGOT. The interpretation of the results of the liver function test examination cannot use only one parameter but uses a combination of several examination results, because the integrity of liver cells is also influenced by extrahepatic factors. Checking liver function is indicated for screening or detection of abnormalities or liver diseases, helps to establish a diagnosis, estimates the severity of the disease, helps to find the etiology of a disease, assesses the results that the proof of the relationship of the history of pesticide exposure with the incidence of impaired liver function is weakened by measurements of liver enzyme levels and cholinesterase levels which are only carried out once cross-sectional. This makes enforcing a cause-and-effect relationship difficult to formulate. This study showed that there was no relationship between cholinesterase enzyme activity and SGOT levels in farmers in Losari Village, Sumowono District, Semarang Regency.^[2]

Based on data on the number of blood chemical examinations at the North Konawe Regency General Hospital in 2019 amounted to 1,519 cases, an increase in 2020, namely 1,659 cases and an increase in 2020 to 2,264 cases.^[3]

The development of the times, caused everyone to be required to be more advanced. Human beings must be open to new things if they do not want to be left behind by the progress of the times, of course, this has a tremendous influence and impact on developments in various fields and the value of life. The era of globalization has changed the perspective of the world's population and given birth to new habits that are not in accordance with a healthy lifestyle, one of which is consuming alcohol.^[4]

SGOT (Serum glutamic oxaloacetic transaminase) and SGPT (Serum glutamic pyruvate transaminase) are used as examination parameters for impaired liver function because the majority of patients with abnormal or elevated SGOT and SGPT results will be at risk for suffering from liver diseases such as liver cancer, liver cirrhosis. The risk factor for liver disorders is cigarette smoke containing chemicals will be carried to the lungs and then blood flow will distribute throughout the body. One of the enzymes in the liver binds to chemicals in cigarettes and can cause cancer. Smoking causes lipid peroxidation which leads to damage to normal cell membranes of the liver. If there is damage to hepar cells, there will be an increase in SGPT and SGOT in smokers compared to non-smokers.^[5]

Method

The type of research used in this study is quantitative with observational methods with a Case Control Study Design approach. The design of the Case Control Study is to analyze the Risk Factor between independent variables and dependent variables retrospectively. The study has been carried out for 30 days. The population numbered 48 people. The Study Sample totaled 23 SGOT and SGPT improvement samples and 23 control samples. The sample technique in this study is Simple Random Sampling. The data was processed using the Data Normality Test (Kolmogrov Smirnov Test) Odds Ratio Test and logistic regression.

Result

Table 1 shows that out of 23 sample cases of increased serum glutamate pyruvate transferase (SGPT) levels, there were 18 (78.3%) respondents at risk and 5 (21.7%) respondents who were not at risk. Of the 23 control samples, elevated levels of serum glutamate pyruvate transferase (SGPT), 13 (67.4%) were at risk and 10 (32.6%) were respondents who were not at risk. Based on the results of statistical tests using the odds ratio test, the OR value of 2.769 Lower limit (LL) value of 0.763 and the Upear Limit (UL) value of 10.049 shows that cigarette consumption is at risk of 3

times the increase in serum glutamate pyruvate transferase (SGPT) levels compared to those who do not consume cigarettes.

Table 2 shows that out of 23 sample cases of increased serum glutamate pyruvate transferase (SGPT) levels, there were 17 (73.9%) respondents at risk and 6 (26.1%) respondents who were not at risk. Of the 23 control samples for elevated levels of serum glutamate pyruvate transferase (SGOT) and serum glutamate pyruvate transferase (SGPT), 7 (30.4%) were at risk and 16 (69.6%) were respondents who were not at risk. Based on the results of statistical tests using the odds ratio test, the OR value of 6,476 Lower limit (LL) values of 1,789 and the Upear Limit (UL) value of 23,444 shows that alcohol consumption is at risk of 7

transferase (SGPT) compared to those who do not consume alcohol.

Table 3 shows that out of 23 sample cases of increased serum glutamate pyruvate transferase (SGPT) levels, there were 17 (73.9%) respondents at risk and 6 (26.1%) respondents who were not at risk. Of the 23 control samples for increased serum glutamate pyruvate transferase (SGPT) levels, 8 (34.8%) were at risk and 15 (65.2%) were respondents who were not at risk. Based on the results of statistical tests using the odds ratio test, the OR value of 5.312 Lower limit (LL) values of 1.498 and the Upear Limit (UL) value of 18.840 shows that the consumption of drugs is at risk of 6 times the increase in serum glutamate pyruvate transferase (SGPT) levels compared to those who do not consume drugs.

Table 1
Risk Factors for Cigarette Consumption to Increase Serum Glutamate Pyruvate Transferase (SGPT) Levels on Communities in the North Konawe Regency

| Cigarette Consumption | SGPT improvements | | | | | | OR | LL | UL |
|-----------------------|-------------------|------|---------|------|-------|------|-------|-------|--------|
| | Case | | Control | | Total | | | | |
| | n | % | n | % | n | % | | | |
| Risk | 18 | 78,3 | 13 | 67,4 | 31 | 67,4 | 2,769 | 0,763 | 10,049 |
| No Risk | 5 | 21,7 | 10 | 32,6 | 15 | 32,6 | | | |
| Total | 23 | 100 | 23 | 100 | 46 | 100 | | | |

Table 2
Risk Factors for Alcohol Consumption to Increased Levels of Serum Glutamate Pyruvate Transferase (SGPT) Levels on Communities in the North Konawe Regency

| Alcohol Consumption | SGPT improvements | | | | | | OR | LL | UL |
|---------------------|-------------------|------|---------|------|-------|------|-------|-------|--------|
| | Case | | Control | | Total | | | | |
| | n | % | n | % | n | % | | | |
| Risk | 17 | 73,9 | 7 | 30,4 | 24 | 52,2 | 6,476 | 1,789 | 23,444 |
| No Risk | 6 | 26,1 | 16 | 69,6 | 22 | 47,8 | | | |
| Total | 23 | 100 | 23 | 100 | 46 | 100 | | | |

Table 3
Risk Factors for Drug Consumption to Increase Serum Glutamate Pyruvate Transferase (SGPT) Levels on Communities in the North Konawe Regency

| Drugs Consumption | SGPT improvements | | | | | | OR | LL | UL |
|-------------------|-------------------|------|---------|------|-------|------|-------|-------|--------|
| | Case | | Control | | Total | | | | |
| | n | % | n | % | n | % | | | |
| Risk | 17 | 73,9 | 8 | 34,8 | 25 | 54,3 | 5,312 | 1,498 | 18,840 |
| No Risk | 6 | 26,1 | 15 | 65,2 | 21 | 45,7 | | | |
| Total | 23 | 100 | 23 | 100 | 46 | 100 | | | |

Discussion

Smoking has become a habit for some people in everyday life because it follows the lifestyle of the surrounding environment or as a means to escape from the problems encountered. The negative impact of the habit of smoking cigarettes is numerous and unlimited. The three main harmful substances present in cigarettes can cause damage to the liver and heart organs. When liver and heart cells are injured, the enzyme Serum Glutamic Oxaloacetic Transaminase (SGOT) will be released into the blood and become a marker of disturbances in the liver and heart.^[6]

Masyita's research shows that SGPT enzymes are more abundant in the liver than SGOT enzymes and SGPT enzymes are an acute sign of damage to the cell membranes. If there is hepar damage, the SGPT enzyme comes out of the cytoplasm of the hepar cell into the blood circulation so that the SGPT enzyme increases in the blood. In this study, the average respondent smoked more than 10 years. This is in accordance with the literature that exposure to chronic cigarette smoke can cause chronic cell damage due to continuous exposure to cigarette chemical compounds, including seikuppfler and various secreted cytokines. Cigarette smoke containing very high amounts of free radicals is estimated that in one suction there are 1014 free radical molecules. Free radicals are highly reactive atoms that can trigger oxidative stress on liver cells.^[7]

Hepatitis is a disorder in the form of liver inflammation that can be caused by parasitic infections, protozoa, bacteria, viruses, metabolic disorders, drugs, and alcohol that cause damage to human liver cells and can affect all ages, genders, and races around the world. Serum Glutamic Oxaloacetic Transaminase (SGOT) and Serum Glutamic Pyruvic Transaminase (SGPT) levels in EDTA plasma can tend to increase more than serum, this is because in EDTA plasma there are coagulation factors that can interfere with the examination of SGOT and SGPT levels in the device, while serum consists of proteins, electrolytes, antibodies, antigens, and hormones that do not contain coagulation factors.^[8]

Liver damage due to the drug is a serious health problem. One of the risk factors is the presence of liver disease. Data on drug use is obtained from the patient's medical record in terms of prescribing or using the drug given. The results

showed that patients with impaired liver function still used drugs that induce liver damage by 35.32% with 28 types of drugs. The most common types of drugs used are ranitidine, seftriaxone, spironolactone, furosemide, and paracetamol. This shows that there is still a lot of use of liver damage-inducing drugs that are still used by patients with impaired liver function.^[9]

The use of antipsychotics to treat acute psychotic episodes as well as asrumatan therapy to prevent recurrence. Antipsychotics can be both monotherapy and combination. Commonly used antipsychotics are chlorpromazine and haloperidol. Most antipsychotics must pass through a complete metabolic process in the liver in order to be excreted through the kidneys, therefore it is very likely that antipsychotics can cause drug-induced liver injury (DILI). Transaminase enzymes, namely SGOT / AST (serum glutamic oxaloacetic transaminase / aspartate transaminase) and SGPT / ALT (serum glutamic pyruvic transaminase / alanine transaminase) can be used as screening or examination of liver cell damage (hepatocellular injury) caused by various etiologies.^[10]

Conclusion

Research shows that cigarette consumption, alcohol consumption and drug consumption are risk factors for serum glutamate pyruvate transferase (SGPT) levels in the People of North Konawe Regency.

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