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Description Of The Enzyme Gamma Glutamyl Transferase In The Patient Hepatitis

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ABSTRACT

Hepatitis caused by the hepatitis virus is still an endemic disease in Indonesia. Most hepatitis viruses are caused by infection with hepatitis viruses A,B,C,D,E. The large number of hepatitis sufferers requires liver function test, one of which is Gamma Glutamyl Transferase (GGT). Objective: This research aims to find out what the gamma glutamyl transferase enzyme looks like in hepatitis sufferers. This research was carried out at the Mataram City Regional Hospital from November to December 2023. The sampling method was carried out using a simple random sampling technique with a total of 25 samples. Examination of Gamma Glutamyl Transferase levels was obtained from 25 patients suffering from hepatitis who tested positive using the enzymatic colometry method. It was found that GGT levels were increased in 5 patients (20%) with an average increase in GGT levels of 185.2 U/L and the average -average normal GGT level is 22.65 U/L. Conclusions: There was an increase in Gamma Glutamyl Transferase levels in 5 patients (20%).

INTRODUCTION

An increase in liver enzyme levels caused by damage or disruption of the liver membrane is a sign of liver inflammation known as hepatitis. Blood refusal leads to high blood pressure and vascular rupture, which makes hepatitis extremely dangerous to the overall health of the body. Hepatitis is a very common disease around the world and is considered a public health problem that needs to be addressed as it can lead to death. Hepatitis is usually classified as acute or chronic. (Koeswara, 2020).

Hepatitis can be caused by a variety of viruses, bacteria, parasites, fungi, and alcohol. However, viruses are the main cause of hepatitis. In Indonesia, hepatitis virus is still frequently causing Hepatitis. Most hepatitis viruses are derived from hepatite A, B, C, D, and E viruses. Hepatitis symptoms are similar to fever.tingling, loss of appetite or anorexia, nausea, discomfort in the stomach, jaundice (yellowish in the skin and eyes) and joint pain are all the symptoms mentioned above (Ramdhani et al., 2015).

It is estimated that the hepatitis virus causes 1.4 million deaths every year worldwide. In 2015, 257 million people worldwide were infected with the hepatitis B virus (HBV) and 71 million people had the Hepatitis C virus (HCV). Most hepatitis, cirrhosis, and liver disease-related deaths in Indonesia are caused by the viruses of Hepatitis B and C. According to Riskesdas data 2013, Hepatitis B (HBsAg) is commonly found in 7.1% of Indonesians. In addition, the prevalence of HBsAg in pregnant women is still quite high, ranging from 1.82% to 2.46%, and the anti-HCV prevalence for hepatitis C is generally 1%. The spread of

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hepatite C also occurs in some groups of people, such as injectable napza users 13.8%-31.1%, hemodialysis patients 3.7%-18.6%, and blood transfusion recipients 4.5-11%. (Kementerian Kesehatan RI, 2018).

One of them is the enzyme Gamma Glutamyl Transferase (GGT), which is associated with marker blocking of bile pockets and sensitive to detect hepatitis and other liver diseases. (Sakinah & Gugun, 2013).

One way to test liver function is by looking at the GGT enzyme. GGT is found in the pancreas, kidneys, and liver cells. In the bile, GGT lies in the epithelial cell, but in the liver cell is located in the endoplasmic reticulum. Obstructive jaundice, cholangitis, and cholestasis may indicate increased GGT enzyme activity. The failure of the bile flow to reach the duodenum is called cholestasis. (Sitarani, 2020).

GGT enzymes are most commonly found in the liver and kidneys; they are also less common in the prostate, lymph, and heart. Although the kidneys have the highest levels of enzymes, the liver is considered the source of the GGT enzyme. Produced in the bile tract, the GGT enzyme increases its value during biliary disorders. These enzymes carry out amino and peptide transfer. This rate is also found in male prostate compared to female. Jaundice, cholecystitis, and cholangitis can be detected through GGT enzyme monitoring. (Sitarani, 2020).

The GGT enzyme is considered to be one of the obstructive enzymes, and an increase in the GGT enzime correlates better with obstruction and cholestasis than hepatosellular damage. (Samsuria, 2015).

MATERIALS/METHOD

The research was conducted at RSUD Kota Mataram from November until December 2023. The research design used in this study is descriptive, which is a method that serves to describe or give a picture of an object studied through data or samples that have been collected as they are without carrying out analysis making conclusions that apply to the general public. The sampling technique in this study uses Simple Random Sampling, which is taking a sample member from a population that is done randomly without paying attention to the layers in that population.

RESULTS AND DISCUSSION

As for the results of the research that has been carried out in Table 4.1 on Gamma Glutamyl Transferase (GGT) in patients with hepatitis in RSUD Kota Mataram that obtained samples of 25 samples in this study:

Table 1. Data on Gamma Glutamyl Transferase levels in RSUD Mataram City

No	Sample Code	Gender	Types of Hepatitis	GGT Results (U/L)
1	231204S1	Men	Hepatitis B	18
2	231204S2	Woman	Hepatitis B	25
3	231204S3	Woman	Hepatitis B	165
4	231204S4	Woman	Hepatitis B	15
5	231206S5	Men	Hepatitis B	14
6	231207S6	Woman	Hepatitis B	35
7	231208S7	Woman	Hepatitis C	18
8	231208S8	Men	Hepatitis B	112

9	231209S9	Woman	Hepatitis B	11
10	231209S10	Woman	Hepatitis B	20
11	231209S11	Men	Hepatitis C	24
12	231209S12	Men	Hepatitis B	18
13	231211S13	Men	Hepatitis B	35
14	231211S14	Woman	Hepatitis B	134
15	231211S15	Men	Hepatitis B	20
16	231211S16	Men	Hepatitis B	31
17	231212S17	Woman	Hepatitis B	14
18	231213S18	Men	Hepatitis B	30
19	231213S19	Woman	Hepatitis B	25
20	231214S20	Men	Hepatitis B	19
21	231214S21	Woman	Hepatitis B	18
22	231215S22	Men	Hepatitis B	210
23	231219S23	Men	Hepatitis B	305
24	231222S24	Men	Hepatitis B	38
25	231223S25	Men	Hepatitis B	25

The above table shows that out of 25 patients diagnosed with positive hepatitis B and C GGT levels increased in 5 patients with an average increase in GGT level of 185.2 U/L and an average normal GGT rate of 22.65 u/L.

Table 2. Frequency distribution based on increased GGT levels in patients with hepatitis in RSUD Mataram City

GGT rate	Increase		Normal	
	n	%	n	%
Men	3	12	11	44
Woman	2	8	9	36
Amount	5	20	20	80

According to table 4.2, the frequency distribution of GGT results in hepatitis patients from 25 samples resulted in an increase in GGT levels in male patients by 3 (12%) and in female patients by 2 (8%).

The table 4.1 shows that 23 people have been infected with hepatitis B virus and 2 patients have been Infected with Hepatitis C virus. It also shows that the most infected people in Indonesia are hepatites B and C. (Betharina et al., 2017).

Table 4.2 shows that there is an increase in GGT levels in male patients by 12% and an increase of 8% in female patients. An increase in the GGT level indicates the presence of various diseases of liver damage such as inflammation of the liver that can be caused by viral infections such as hepatitis, until damage to liver cells that occurs during Hepatitis can cause the release of GGT into the bloodstream which causes the level GGT to rise.

A study conducted by Pasaribu (2017) found that individuals with hepatic disorders caused by alcohol consumption had higher levels of GGT. A study called "Gamma Glutamyl Trasnferase Imaging in Alcoholic Drinkers" found a 56% increase in normal GGT levels and a 44% decrease at lower levels.

Increased GGT enzyme activity can also increase as a result of liver damage or disturbance of the gall canal. The relationship between GGT levels and the duration of infection with hepatitis can vary depending on the type of Hepatitis and individual health conditions. Hepatitis B and C can cause chronic liver infections that can last for years without significant symptoms. However, the duration of infection is not always directly correlated with the GGT level, as individual reactions to the virus vary. In addition to hepatitis, other factors can also affect the relationship between GGT levels and the length of the infection, including underlying health conditions, drug use, alcohol and lifestyle.

Men experience greater gains than women because men follow unhealthy lifestyles, such as smoking, and excessive alcohol consumption, while women pay more attention to a healthy lifestyle and rarely over-consume alcohol. Alcohol consumption can also cause various liver diseases, one of which is alcoholic cirrhosis and hepatitis. (Samosir, 2020).

GGT enzyme activity tests are performed in patients who have symptoms of hepatic or biliary tract disease. Increased GGT activity has also been found to be associated with cardiovascular disease. This enzyme's activity has been found to increase in individuals with diseases such as coronary heart disease (CHD) as a result of arteriosclerosis, congestive heart failure, arterial stiffness, and stroke. Experimental evidence on human arteriosclerotic plaques revealed the active catalytic activity of this enzyme in arteriosklerotical plaques and found a link between the index of instability of the plaque and the activity of the GGT. Epidemiological research also showed a positive correlation of GGT activity with cardiovascular diseases. Gamma-Glutamyl Transferase (GGT) is a transpeptidase with extensive tissue distribution in various body tissues. This enzyme is sensitive to detection of liver damage as well as gall canal constriction but does not specifically indicate the cause of the damage. Increased GGT activity is even higher in patients with alcohol consumption (Gumay & Syazili, 2020).

CONCLUSIONS

Based on the research carried out at the RSUD Laboratory of Mataram City on the picture of the enzyme Gamma Glutamyl Transferase in patients with hepatitis can be concluded that the average level of the GGT enzyme in hepatitis patients is 185.2 U/L. There was an increase in the level of the GGT enzyme in five patients with hepatitis (20%).

REFERENCE

Betharina, N., Hendriyono, F., & Mashuri, M. (2017). Perbedaan Hasil Laboratorium Penderita Hepatitis B Dan C Kronis Dengan Derajat Fibrosis Hati. *Berkala Kedokteran, 13*(1), 41. https://doi.org/10.20527/jbk.v13i1.3438

Gumay, B. S., & Syazili, M. (2020). Penggunaan Klinis Aktivitas Enzim Gamma-Glutamyl Transferase (GGT) Plasma dan Potensinya sebagai Biomarker untuk Berbagai Penyakit. *Medical Journal of Lampung University, 9*(1), 1–6. http://repository.lppm.unila.ac.id

Kementerian Kesehatan RI. (2018). Direktorat Pencegahan dan Pengendalian Penyakit Menular Kementerian Kesehatan. *The Acceptance of Islamic Hotel Concept in Malaysia: A Conceptual Paper*, *3*(July), 1–119. http://download.garuda.kemdikbud.go.id/article.php?article=2652619&val=24585&title=Klasifikasi Pneumonia Menggunakan Metode Support Vector Machine

koeswara. (2020). Penerapan Particle Swarm Optimization (PSO) Dalam Pemilihan Atribut Untuk Meningkatkan Akurasi Prediksi Diagnosispenyakit Hepatitis Dengan Metode Naive Bayes. *Journal Speed – Sentra Penelitian Engineering Dan Edukasi, 12*(1), 1–

10.
Ramdhani, A., Isnanto, R. R., & Windasari, I. P. (2015). Pengembangan Sistem Pakar Untuk Diagnosis Penyakit Hepatitis Berbasis Web Menggunakan Metode Certainty Factor. *Jurnal Teknologi Dan Sistem Komputer*, *3*(1), 58. https://doi.org/10.14710/jtsiskom.3.1.2015.58-64
Sakinah, H., & Gugun, A. M. (2013). Korelasi gambaran ultrasonografi hepar dengan kadar alkali fosfatase pasien klinis hepatitis. *Mutiara Medika*, *13*(1), 1–6.
Samosir, M. F. (2020). *Gambarn Kadar Gamma-GT (Gama Glutamyl Transferase) pasa Pengonsumsi Tuak.*
Samsuria, I. (2015). *Perbedaan Kadar ALT, AST, ALP, dan GGT pada Hepatitis B dan Sirosis Hepatitis*. 1–8.
Sitarani. (2020). *Funsi Hati Pada Kasus Pengonsumsi Alkohol*. *17010165*.