JURNAL
Pendidikan, Sains, Sosial dan Agama
SEKOLAH TINGGI AGAMA BUDDHA NEGERI RADEN WIJAYA WONOGIRI

Analysis Of Sgot And Sgpt Levels Using A Photometer (Microlab L300) And Auto Chemistry Analyzer (Glory 917) At Sapta Medika Hospital

Ega Dewani Putri[1], Fitri Handayani Siregar[2], Sri Muri Dasa Wardhani[3]
Program Studi Pendidikan Antropologi, Fakultas Ilmu Sosial, Universitas Negeri Medan
egadewanippane99@gmail.com, fitrihandayannii10@gmail.com, srimuridw@gmail.com

Article History:
Received: 10 January 2025 *Revised: 6 October 2025* *Published: 10 Februari 2025*

Abstract

The liver is the most complex metabolic organ in the body. Liver function tests indicate the extent of liver damage. This practicum was conducted at the Integrated Laboratory Center of Syarif Hidayatullah State Islamic University, Jakarta, to understand liver function and understand its role. draft activity specific Glutamate Pyruvate Transaminase (GPT) and Glutamate Oxaloacetate Transaminase (GOT). The tools and materials used in this practicum include test tubes, syringes, vaccutainers, centrifuges, Zenix 188, dextran, serum, reagents R1 and R2, and aquabidest. The results obtained were that the six probands had normal SGPT and SGOT levels, while the normal SGPT level in men is 0-41 u/L and in women is 0-31 u/L.

Keywords: SGOT and SGPT Levels, Photometer (Microlab L300), aAuto Chemistry Analyzer (Glory 917)

INTRODUCTION

The liver is the largest and most metabolically complex organ in the body. It is involved in the metabolism of nutrients, as well as most drugs and toxic substances. Structurally, the liver is composed of hepatocytes (liver parenchymal cells). Hepatocytes are responsible for the liver's central role in metabolism (Hidayat, Kurniawan, Rahayu, & Wiryanti, 2024).

Liver function test (LFT) or test function heart is tests that can show level damage on heart. On testing damage liver, disorders visible biochemistry is improvement permeability wall cells, reduced capacity synthesis, disruption function excretion, decreased capacity storage, disturbance function detoxification, improvement reaction mesenchymal and immunological abnormalities. Inspection serum glutamic acid levels pyruvite transaminase or Alanine aminotransferase (SGPT or ALAT) and serum glutamic acid levels oxaloacetic transaminase or aspartate aminotransferase (SGOT or ASAT) is Wrong One from many test function heart. Second test This measure level enzymes contained in liver, heart and muscles (Nuryani, Pudyastuti, Harmilah, Rahmawati, & Nuryati, 2024).

TOOL is more tests specific For damage heart compared to ASAT. AL A T is enzymes that are made in cell liver (hepatocytes), so more specific For disease heart compared to with other enzymes. Usually increase in AL A T occurs what if There is damage on membrane cell heart. Every type inflammation heart can cause improvement in AL A T. Inflammation on heart can caused by by hepatitis virus, drugs, use alcohol, and disease on

channel fluid gallbladder (Nuryani et al., 2024). AS A T is enzyme mitochondria which also found in heart, kidneys and brain. So test This not enough specific For disease heart, but in a number of case inflammation liver, an increase in AL A T and AS A T will similar (Nuryani et al., 2024).

Objective from test This is For understand function heart for body as well as understand draft activity specific Glutamate Pyruvate Transaminase (GPT) and Glutamate Oxaloacetate Transaminase (GOT) (Wiraguna, 2024).

METHODS

The SGPT and SGOT level examination practicum was conducted on April 27, 2018 at the Physiology Laboratory of the Integrated Laboratory Center (PLT) of UIN Syarif Hidayatullah Jakarta.

The tools and materials used in this practicum include test tubes, syringes, vaccutainers, centrifuges, Zenix 188, dextran, serum, reagents R1 and R2, and aquabidest. The experiment was carried out in three stages: serum preparation, sample preparation, and sample examination using Zenix 188 (Harahap, Rostini, & Suraya, 2024). Serum preparation begins with drawing 3 ml of blood. The blood is then centrifuged at 4,000 rpm for 10 minutes. The serum is ready to use (Lamonge, Sumilat, Lombogia, & Sasube, 2023).

Sample preparation is divided into two parts: SGPT testing and SGOT testing. The first step is to add 500 µl of R1 to a test tube and mix it with 100 µl of R2. This mixture is called the working fluid. reagent. Working The reagent was placed into a test tube at 500 µl, then mixed with 50 µl of serum. The examination was carried out using Zenix 188 (Suparyati & Suparyati, 2025).

The Zenix 188 is turned on by pressing the button on the back of the device. Press button 1 to perform a test. Select the parameter to be tested. When the device requests water, press the button. blank aspirate, aquabidest is inserted into the feed tube and then the aspiration button is pressed (Anggraini, 2022).. After that, the sample is inserted into the feed tube and then the aspiration button is pressed. Wait until the examination results come out. Then press the rinse button. When the examination is complete, press the ESC button. Insert aquabidest and press the aspiration button (Sari, Orno, & Hasan, 2023) Press button 4 to turn off the device. After the Power Off message appears, press ENTER. Insert the dextran solution into the feed tube and press the aspiration button. The device is turned off and the plug is unplugged (Ahdi, 2023).

RESULTS AND DISCUSSION

Table 1. SGPT and SGOT Levels in Blood

Probandus	Liver Enzyme Level (u/l)	
	SGPT	SGOT
Heru	15.4	14.4
Bagas	11.4	17.0

Faris	11.9	25.9
Qori	6.4	16.5
Apriani	10.7	15.3
Nurul	22.1	26.1

, Based on the practicum carried out, the results of the examination of SGPT (Serum Glutamate) were obtained (Lestari, 2024). Phosphate Transaminase) and SGOT (Serum Glutamate) Oxaloacetate Transaminase) in the six subjects, consisting of three men and three women. SGPT testing is a more sensitive indicator of liver damage than SGOT. This is because the GPT enzyme is primarily found in the liver, while the GOT enzyme is found in large quantities in tissues, especially the heart, muscles, kidneys, and brain (NOVITASARI, 2023)

SGPT examination is carried out using reagents R1 and R2. Reagent R1 contains Tris buffer (132.5 mmol /L), L- alanine (687.5 mmol /L), LDH (≥ 2,300 u/L), Sodium azide (0.095%). While reagent R2 contains Tris Buffer, NADH, Ketoglutarate, Sodium azide (Riesty, 2023).

SGPT and SGOT measurements are performed on blood serum drawn from the branchial vein. Serum contains dissolved proteins, including enzymes. Serum is used because it does not contain fibrinogen, which is present in plasma, which can increase absorbance measurements by 3-5% ((Ayomi, Annamayra, & Jusuf, 2023).

According to Syaifuddin (2006), the normal SGPT level in men is 0-41 u/L and in women is 0-31 u/L. Thus, based on the results table, although Qori's probandus has a lower SGPT value of 6.4 u/L and Nurul's probandus has the highest SGPT value of 22.1 u/L. However, the SGPT values of the six probandus are included in the normal level. In the SGPT and SGOT tests, the liver can be said to be damaged if the amount of these enzymes in the plasma is greater than the normal level (Aryani, Putri, & Widada, 2024). Based on this, the liver condition of the six probandus is not damaged because they have SGPT values within the normal range (Rustiah, Muawanah, Rahmawati, Azis, & Rahman, 2022). Likewise with SGOT measurement, probandus own SGOT values are still including into the normal levels if seen from table and based on statement previously about normal levels of S GOT (Muhamad Taufik Amaluddin, 2023)(Hartini, Khotimah, & Kusumawati, 2024).

In SGPT and SGOT tests, liver damage can be considered if the levels of these enzymes in the plasma are higher than normal. Based on this, the livers of the six subjects were not damaged because their SGPT values were within the normal range. SGPT and SGOT levels can caused by by the bad pattern sleep and stress or pattern undereating Good with consume carbohydrate too Lots whereas heart in circumstances No good (Paskah Riang Hura, 2024). The damage function heart over time can cause complications that can increase SGOT levels, damage to the body's organ systems which often occurs, especially the nervous system and blood vessel (Nurhuda, Siana, & Annisa, 2023). If SGPT and SGOT levels increase 20-100 times above normal happen on necrosis cell heart caused by drugs and poisons (Richi Octaviades, 2024).

SGPT or ALT, the principle is that the enzyme found in the patient's serum will catalyze the reaction between oxoglutarate and L-alanine to form glutamate and pyruvate. The pyruvate formed reacts with NADH to form lactate and SGPT can be seen after 1 minute of the reaction (Aurelia & Kurniati, 2022).

Meanwhile, Glutamate oxaloacetate transamiase (GOT) or aspartate transaminase (ASAT) has principle catalyzes the transfer of amino groups from L- aspartate to 2-oxoglutarate for form oxaloacetate and L- glutamate. Then Lactate dehydrogenase (LDH) converts oxaloacetate to L- malate with oxidize NADH to NAD (Dewi, 2024).

According to Wrong One study about inspection SGPT and SGOT levels, the results of the statistical correlation test showed a significant correlation between SGOT and SGPT levels (p=0.00) with a correlation coefficient of 0.936 forming a positive direction, meaning that the higher the SGOT level, the higher the SGPT level. The results of the statistical correlation test showed a significant correlation between SGPT levels. This can also be seen with proximity SGPT and SGOT levels obtained from this practicum (Nuripto, Zain, Salasanti, & Rahmawati, 2023).

CONCLUSION

1. The liver functions as an organ that regulates the body's metabolism.
2. The SGPT test is more sensitive to liver damage than the SGOT test. This is because the GPT enzyme is primarily found in the liver, while the GOT enzyme is found in many tissues, particularly the heart, muscles, kidneys, and brain.
3. Probandus Qori had a lower SGPT value, namely 6.4 u/L and probandus Nurul had the highest SGPT value, namely 22.1 u/L.
4. The results of the SGPT examination of the six probands were within normal levels

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