Analysis of Examination Results of Ast (Aspartate Aminotransferase) and Alt (Alanine Aminotransferase) Levels in Covid-19 Patient in RS TK II Pelamonia Makassar

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ABSTRACT
Covid-19 (Corona Virus Disease 2019) patients tend to have abnormalities in liver function tests, therefore the examination of AST and ALT levels as very specific parameters, is really useful in assessing liver function and exploring the severity of the disease suffered by patients. The aims of this study was to analyze the examination results of AST (Aspartate Aminotransferase) and ALT (Alanine Aminotransferase) levels in COVID-19 patient. The type of research wais in the form of laboratory observation by referring to secondary data obtained from the medical record database of patients diagnosed with Covid-19. Descriptive research method with sampling technique using simple random sampling There were 100 samples consisting of 51 men and 49 women, were taken in RS Tk.II Pelamonia Makassar on April 9th to 20th, 2021. For two days, focus of the study was obtained that the examination results of AST and ALT levels were from 100 samples showing that 74% of AST levels were normal and 26% were abnormal, while ALT levels were 72% normal and 28% abnormal. These results refer to the standard AST/SGOT for Men 10 - 37 U/l and Women 10 - 31 U/l, while for ALT/SGPT, for Men: 10 - 41 U/l and Women 10 - 31 U/l. The conclusion of the study showed that the normal results of AST levels were more than the abnormal values, as well as the normal values of ALT levels more than those that were not normal. It is recommended for further researcher to use more complete data and consider factor that can affect the examination results.
Keywords: *Covid-19, AST, ALT*

INTRODUCTION

COVID-19 (Corona Virus Disease 2019) is an infectious disease caused by SARS-CoV-2, which is a species of coronavirus. Previously this virus was named 2019 Novel Coronavirus (2019-nCoV) identified as the cause of the outbreak of a respiratory disease which was first detected in Wuhan, China and then in the end this disease resulted in a pandemic since 2020 (CDC, 2020). Common symptoms of COVID-19 patients are fever, dry cough, and difficulty breathing. For symptoms of sore throat, runny nose, or sneezing are less common. In patients who have low immunity or are susceptible, such as the elderly, this disease can lead to pneumonia and multiorgan failure. When a person is infected with the virus, symptoms will begin to appear in patients with a span of 5-6 days, but it can also take up to 14 days on average. (World Health Organization, 2020)

This type of virus was initially detected in China, Hubei Province, precisely in Wuhan City on December 31, 2019 with cases of pneumonia symptoms in patients with no known cause (WHO, 2020). In Indonesia the COVID-19 pandemic is confirmed to have spread to Indonesia starting on March 2, 2020, and finally the COVID-19 pandemic finally spread to all provinces in Indonesia on April 9, 2020 (Wikipedia, 2020)

According to data from WHO (2021) that globally, SARS-Cov-2 has spread to 222 countries, a total of 82,579,768 people have been confirmed and 1,818,849 died due to infection with this virus. Then according to the COVID-19 Handling Task Force (2020) data for Indonesia shows 76,5350 people have been confirmed positive, 63,1937 people have recovered, and 22,734 people have died.

Based on data from the official website of South Sulawesi Responding to Covid-19 (2021), it was reported that COVID-19 data as of January 3, 2021 in South Sulawesi Province showed 32,782 confirmed cases, 3,363 active cases, 28,812 recovered (87.9% of confirmed), 607 died (1.9% of confirmed cases). % of confirmed), and 11,339 people are suspected. While special data for Makassar City shows 12,828 total confirmed

cases, 10,367 recovered and 340 people died (City Government, 2021)

The liver is the largest gland in the human body and is brownish red in color. The liver is the largest gland in the human body which weighs around 1,400 – 1,800 g in men and in women which is about 1,200-400 g, in general the liver covers 1/40 of the body weight. (Mashudi, 2011). in the body have various functions. The three basic functions of the liver are to form and secrete bile into the intestinal tract; plays a role in various metabolisms related to carbohydrates, lipids and proteins; filter the blood, get rid of bacteria and foreign objects that enter the blood (Maulina, 2018). The liver contains thousands of enzymes, some of which are also carried by the serum in very low amounts. They are distributed in plasma and interstitial fluid and have a characteristic half-life, usually in days. The increased activity of an enzyme in serum is thought to mainly reflect an increase in the rate at which the enzyme enters the serum from damaged liver cells. (Dan L. Longo and Anthony S Fauci, 2010).

Aminotransferase (transaminase) is a very specific parameter and is useful in assessing liver function in detecting acute hepatocellular disorders. This liver enzyme consists of aspartate aminotransferase (AST) and alanine aminotransferase (ALT). AST was found in order of decreasing concentration of liver, muscle, heart, skeletal muscle, kidney, brain, pancreas, lung, leukocytes, and erythrocytes. ALT is mainly found in the liver. In general, aminotransferase enzymes are normally only present in cells and very little in serum. If there is damage to the liver cell membrane resulting in an increase in cell permeability, these enzymes will be released and circulated in the blood circulation in greater concentrations (Dan L. Longo and Anthony S Fauci, 2010).

COVID-19 patients with a severe infection phase will tend to have abnormalities in liver function tests. It may be that liver injury in COVID-19 is multifactorial, direct pathogenic effects of the virus, consumption of drugs that contain multiple side effects, systemic immune reactions and hypoxia which are potential causes of liver damage experienced by COVID-19 patients. Some of the COVID-19 patients with impaired liver function also tend to have a worse prognosis. (Ali, 2020)

Comorbid diseases such as acute inflammation and decreased organ function (heart, kidney, liver, and hematology as well as cardiovascular disease, chronic lung disease, diabetes, heart disease experienced by patients at the beginning of treatment can increase the severity of the disease and the risk of death due to COVID-19 infection (Raden,2020)

According to the study of Shweta et al (2020), it has been noted that death due to liver disease remains a significant association with COVID-19 among all comorbidities. In addition, the treatment regime involves drugs such as losartan, ACE inhibitors, angiotensin receptor blockers, Remdesivir, Chloroquine, Hydroxychlooquine, etc. can modulate comorbidity severity. With the conclusion that comorbidities can cause serious problems in the treatment process and can worsen the disease.

Based on the results of a review by Tasha Salsabila et al (2020) that one of the mechanisms for increasing liver function is due to the hepatotoxic effect of several drugs used in the treatment of COVID-19 patients, such as chloroquine, macrolides, quinolones, and lopinavir/ritonavir. It was reported that there was an association between the use of lopinavir/ritonavir and ribavirin with the incidence of liver function abnormalities; lopinavir/ritonavir significantly increased AST, GGT levels and caused a slight increase in ALP levels

According to Ali Nurshad's (2020) review, that the results of a recent study Hospitals reported elevated levels of AST (58%) and ALT (39%) in COVID-19 patients who had undergo treatment. Furthermore, AST levels increased by 62% in patients in the Intensive Care Unit (ICU), and as much as 25% in non-ICU patients.

Another study reported that 76.3% had abnormalities in liver function tests and 21.5% had liver damage. This study shows that there is a relationship between elevated liver enzymes from the normal range that is considered abnormal and disease progression. If not treated properly, this enzyme causes severe liver damage.

Based on the results of the study by Piano Salvatore, et al (2020) regarding Liver Function Test Abnormalities in predicting transfer to the ICU and death in COVID-19 patients, a study was conducted on 565 patients out of 615 who were hospitalized with confirmed COVID-19. And it was reported that as many as 329 patients (58%) had abnormal liver function tests. Among them for levels of AS T (44%) and ALT (32%).

Based on the results of research by Darnindro Nikko, et al (2020) at Fatmawati Hospital there were 42 of the 191 patients who were treated had confirmed COVID-19 by PCR results. It was reported that there was an increase in AST enzymes as much as 71.4% and while ALT increased by 42.9% in patients. Of all patients, an increase in AST 1-2 times the normal value occurred in 14 patients (33.3%) and an AST increase> 2-fold above the upper normal limit (UNL) was found in 16 patients (38%). In contrast, the increase in ALT was similar for both groups, namely 1-2 times and 2 times above the normal value (21.4%). Mortality in COVID-19 patients undergoing treatment in hospitals is still very high. One of the factors that influence the risk of poor prognosis in this disease is an increase in transaminase enzyme levels which are significantly associated with death. The higher the AST level, the higher the risk of death.

Based on the description above, researchers are interested in conducting research on "Analysis of Examination Results for AST (Aspartate Aminotransferase) and ALT (Alanine Aminotransferase) levels in COVID-19 patients at Tk II Pelamonia Hospital Makassar".

METHODS

Type of Research, Location and Time

The type of research used is laboratory observation, namely the analysis of the results of the examination of AST (Aspartate Aminotransferase) and ALT levels. (Aspartate Aminotransferase) in Covid-19 patients. Pelamonia Hospital Research Site, On 19 – April 20, 2021.

Population, Sample, Collection Technique

The population in this study are COVID-19 patients listed in the Home medical record Pelamonia Sick. The sample used in this study were COVID-19 patients who were tested for AST (Aspartate Aminotransferase) and ALT (Aspartate Aminotransferase) levels and listed in medical records in April 2020 – December 2020 at Pelamonia Hospital. The sampling technique in this study is simple random sampling. With collected data on examinations of COVID-19 patients from April 2020 – March 2021. The data used in this study were the results of examination of AST (Aspartate Aminotransferase) and ALT (Aspartate Aminotransferase) levels in Covid-19 patients.

Research Instruments and Materials

The instruments that will be used in this research are, 3 ml syringe, non anticoagulant vacuum tube (red cap), tube rack micropipette tip, centrifuge, Cobas C-311 tool and personal protective equipment.(PPE), which consists of laboratory cats, masks, and handscoons. The materials that will be used in this research are Serum from Covid-19 Patients and 70% alcohol cotton.

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Research Work Procedure

First, pre-analysis is carried out, namely: Turn on the tool: Turn on the instrument by pressing the power button on the right side of the tool, Turn on the computer and monitor control unit, Turn on the Cobas link, Log on to the monitor screen by entering the Operator ID and Password, the tool will automatically perform initialization and routine maintenance. After that is done the Calibration Procedure Select the Calibration Menu, Select Status, Select the test to be calibrated and select the calibration method, Do the same for all the tests you want to calibrate, Select Save, Select Start to start calibration. After performing the calibration process, continue with the Quality Control process, Select the Quality Control menu, select Status, select Select for the type of test to be controlled, Select Save (the selected parameter will be green), Place control on the specified disk sample, Select Start. Next is the Analytical Examination without barcodes, namely: Select Workplace, Select Test Selection, then select Routine(N), Enter the patient sequence number and then the sample position disk in the tool, Enter the patient sample ID (For samples with external dilution (manual), select predilution, For sample with internal dilution (automatically done by the tool), select the dilution factor from the sample volume / dilution column). Select the test you want to check, Select Save, Perform steps 1-6 for the other samples Select Start and then enter the first number of the patient sequence. Then check with barcode: Select System Overview, Select Sample Tracking, Place sample on disk, Place stop barcode after last sample, press sample scan, After standby, select Workplace, Select Test Selection, then select sample and parameters to be checked, Select Save, Select Start. Post-Analytical Reading of Results: There are results in the form of sheets of paper that come out of the printer and monitor screen. Reporting Results Save the examination results obtained on the device and record the results in the album book Reference Value: AST/SGOT for Men 10 - 37 U/l and Women 10 - 31 U/l, while for ALT/SGPT i.e for Men : 10 - 41 U/l and Women 10 – 31 U/L. (Prameswari, 2014)

Data analysis

For the analysis of the results of the examination of AST (Aspartate Aminotransferase) and ALT (Aspartate Aminotransferase) levels in Covid-19 patients at the Tk II Pelamonia Hospital in Makassar, the results will be analyzed descriptively by first analyzing univariate to describe the frequency distribution of each variable, then bivariate analysis was carried out with Chi-square test (X2) to determine the relationship between each variable, then the results were discussed in a narrative manner.

RESULTS AND DISCUSSION

Based on table 4.1, it can be seen that from 100 Covid-19 patients, research subjects were divided into 4 age groups based on age, namely patients aged 6-24 years as many as 18 people (18%), 25-43 years as many as 42 people (42%), 44 - 62 years as many as 31 people (31%), and 63 - 81 years as many as 9 people (9%).

Based on table 4.2, it can be seen that from 100 samples of Covid-19 patients, 51 samples were obtained with male gender (51%) while 49 people (49%).

Based on table 4.3, it can be seen that from 100 samples of Covid-19 patients, AST levels were obtained with normal values as many as 74 samples (74%) and abnormal as many as 26 samples (26%).

Based on table 4.4, it can be seen that from 100 samples of Covid-19 patients, 72 samples (72%) of normal ALT levels were obtained and 28 samples (28%).

In table 4.5 it can be seen that from 100 samples of COVID-19 patients analyzed for the age group 6 – 24 years, the results of AST levels with normal values were 15 samples (15%), and 3 samples were abnormal (3%). The 25-43 year

age group obtained AST levels with normal values in 30 samples (30%) and abnormal values in 12 samples (12%). In the 44-62 year age group, the results of AST levels were 22 samples (22%) normal and 9 samples (9%). In the age group 63 - 81 years, the results of AST levels were 7 samples (7%) normal and 2 samples (2%).

In table 4.6, it can be seen that from 100 samples of COVID-19 patients analyzed for the age group 6 – 24 years, ALT levels were obtained with normal values for 14 samples (14%), and 4 samples (4%). In the 25-43 year age group, the results of ALT levels were 29 samples (29%) normal and 13 samples (13%). In the 44-62 year age group, the results of ALT levels were 21 samples (21%) normal and 10 samples (10%). In the age group 63 - 81 years, the results of ALT levels were 8 samples (8%) normal and 1 sample (1%).

In table 4.7 it can be seen that from 100 samples of COVID-19 patients analyzed from the male sex variable, the results of AST levels were obtained with normal values for 35 samples (35%) and 16 samples (16%). From the female sex variable, the results of AST levels with normal values were 39 samples (39%) and 10 samples (10%) were not normal. The relationship between the sex of Covid-19 patients and AST levels did not show significance, as evidenced by the p-value obtained ie $0.211 < 0.05$.

In table 4.8 it can be seen that from 100 samples of COVID-19 patients analyzed from the male sex variable, the results of ALT levels were obtained with normal values as many as 31 samples (31%) and abnormal as many as 20 samples (20%). From the female gender variable, the results of ALT levels were obtained with a normal value of 41 samples (41%) and an abnormal value of 8 samples (8%) Relationship between patient gender Covid-19 with ALT levels showed significance as evidenced by the obtained p-value of $0.011 < 0.05$.

Aminotransferase enzymes or Also known as enzymes transaminase is an enzyme that catalyzes the transfer of an amino group reversibly between amino acids and alpha-keto . If a problem occurs or impaired liver function, it will there is a change in permeability cell membrane so that enzyme normal aminotransferases only is in the cell will enter into blood circulation, then it happens increase in enzyme levels aminotransferase in blood (Hartono, 2017)

Two plasma transaminases, ALT and AST, are frequently used to demonstrate hepatocellular destruction. Both of these enzymes can be found in the hepatocyte cytosol and are released when cellular damage occurs. ALT is a more specific enzyme than AST because AST can also be found in cardiac muscle, skeletal muscle, and erythrocytes in addition to hepatocytes. (Walmsleyd, 2007)

Liver function testing is commonly performed at the time of admission of COVID-19 patients and is associated with systemic inflammation, organ dysfunction, and is an independent predictor of transfer to the ICU or death during hospitalization. Patients with abnormal liver function tests while being treated should be followed up carefully to prevent a possible worse outcome. (Piano,2020)

Deaths that occur in COVID-19 patients are very much related to various factors including disorders of liver function. In other corona virus infections, the occurrence of liver dysfunction has been known to be very closely related to the cause of death. (Amalia, 2020)

Based on the data obtained from 100 samples, the results of research samples based on age, gender, AST and ALT levels in COVID-19 patients were obtained. In the study sample, 100 samples of patients were obtained consisting of age and gender variables. The age of the research subjects varied, ranging from 6 years to 81 years, so that 4 groups were obtained based on age, namely patients aged 6-24 years as many as 18 people (18%), 25-43 years as many as 42 people (42%), 44 - 62 years as many as 31 people (31%), and 63 - 81 years as many as 9 people (9%). The determination of this age group is determined through manual calculation of the formula. Meanwhile, based on gender, the results were 51

men and 49 women. The lowest AST level was 9 U/L and the highest AST level was 266 U/L while the lowest ALT level was 7 U/L. and the highest ALT level was 270 U/L.

Based on these results, the most age sufferers from Covid-19 are patients aged 25 – 43. This can happen because this age is a very productive and active age at work and is not much different from the age of 44 – 62 years who are still quite productive. in work. This is different when compared to other ages such as ages 6-24 years which include children and adolescents where the current learning process, both schools and universities, follows instructions from the local government, namely carrying out online learning as well as older ages, namely 63 – 81 years which is an age that tends to be no longer productive in work or active activities outside the home.

As for gender, men are more likely to suffer from Covid-19, this is evidenced by differences in activities or activities and livelihoods where men are more frequent activities outside Women are more encouraged and are often at home to take care of the household

It can be seen that from the 100 samples analyzed, the results of AST levels in COVID-19 patients have been obtained with normal values as many as 74 samples (74%) and abnormal values as many as 26 samples (26%). And for ALT levels, the results of ALT levels in COVID-19 patients obtained results with normal values of 72 samples (72%) and abnormal values of 28 samples (28%). The results of this examination. Refer to value The normal used is AST/SGOT for Men 10 - 37 U/l and Women 10 - 31 U/l, while for ALT/SGPT are for Men: 10 - 41 U/l and Women 10-31 U/l. (Prameswari, 2014)

Based on these results, it was stated that there were abnormal results of AST and ALT levels for some Covid-19 patients. That COVID-19 continues to affect the catbolic and anabolic activities of the liver through hepatocyte injury, either caused by viral exposure or drug consumption and congenital disease, but most likely also caused by systemic inflammation due to complications of organ damage.

In table 4.5, COVID-19 patients aged 6-24 years have AST levels with normal values in 15 samples (15%) and abnormal values in 3 samples (3%). The 25-43 year age group obtained AST levels with normal values in 30 samples (30%) and abnormal values in 12 samples (12%). In the 44-62 year age group, the results of AST levels were 22 samples (22%) normal and 9 samples (9%). In the age group 63 - 81 years, the results of AST levels were 7 samples (7%) normal and 2 samples (2%). While in table 4.6 for ALT levels for the age group 6 – 24 years

The results obtained ALT levels with normal values as many as 14 samples (14%), and abnormal as many as 4 samples (4%). In the 25-43 year age group, the results of ALT levels were 29 samples (29%) normal and 13 samples (13%). In the 44-62 year age group, the results of ALT levels were 21 samples (21%) normal and 10 samples (10%). The age group 63 - 81 years obtained ALT levels with normal values as many as 8 samples (8%) and 1 sample abnormal (1%)

Everyone who has reached old age has the potential to experience health problems, this is because the human immune system will decline with age, which makes it difficult to fight disease. In old age the lung lining will begin to become less elastic, this is quite deadly and dangerous for people who have entered old age due to inflammation caused by the Covid-19 disease, resulting in damage to vital organs such as the liver. However, a person's immune factor is still very influential. (CDC,2020)

In table 4.7, it can be seen that patients with male sex have AST levels with normal values as many as 35 samples and abnormal as many as 16 samples. As for the female gender, the results of AST levels with normal values were 39 samples and not normal as many as 10 samples. However, based on these results, the relationship between the sex of Covid-19 patients and AST levels did not show any significance. male gender has ALT levels with normal values

were 31 samples and 20 samples were not normal. As for the female gender, there were 41 samples of normal ALT levels and 8 samples that were abnormal. The relationship between the sex of Covid-19 patients and ALT levels showed significance, as evidenced by the results obtained.

Based on these results, the increase in ALT levels was more common in males than females. This is usually the case caused by different habits and life activities where men tend to have the habit of consuming cigarettes and alcohol where there is a depletion of hepatoprotective glutathione. It is evident that gender can be a major risk factor for mortality in COVID-19 patients, and it is evident that men have a higher frequency of death than women. This is caused by some basic distinctive differences of the immune system, lifestyle activities, and cigarette consumption. (Raden,2020)

The results of this study are in line with research conducted by Darnindro Nikko, et al (2020) at Fatmawati Hospital on COVID-19 patients confirmed by PCR results. It was reported that there was an increase in AST enzyme as much as 33.3% and while ALT increased by 42.9% in patients. One of the factors that influence the risk of poor prognosis in this disease is an increase in transaminase enzyme levels which are significantly associated with mortality rates.

However, the results of this study are not in line with the review conducted by Ali Nurshad (2020), recently at the hospital reported increased levels of AST (58%) and ALT (39%) in COVID-19 patients undergoing treatment. Furthermore, AST levels increased by 62% in patients in the Intensive Care Unit (ICU), and as much as 25% in non-ICU patients. Another study reported that 76.3% had abnormalities on liver function tests and 21.5% had liver damage. This study shows that there is a relationship between elevated liver enzymes from the normal range which is considered abnormal and the development of liver enzymes.

This is similar to the results of the study by Piano Salvatore, et al (2020) regarding Liver Function Test Abnormalities in COVID-19 patients, a study was conducted on 565 patients out of 615 who were hospitalized with confirmed COVID-19. And it was reported that as many as 329 patients (58%) had abnormal liver function tests including ICU patients who died. Among them for levels of AST (44%) and ALT (32%).

Based on the results of several related research can be concluded that the increase in aminotransferase enzymes or abnormal levels of AST and ALT enzymes is also very dependent on the level of infection stage of the virus or the severity of the patient during exposure to the virus. in the initial infection include fever, dry cough, shortness of breath and some experience condition that worsens resulting in respiratory system problems. This is certainly different from the patient end stage which has clinical manifestations in the form of syndrome extrapulmonary systemic hyperinflammation and at this stage, several signs of high systemic inflammation have emerged that lead to a decrease in helper T cells, resulting in inflammatory cytokines and biomarkers such as IL-2, IL-6, IL-7, G-CSF, macrophage inflammatory protein 1- a, TNF-a, C-RP, ferritin, and D-dimer were significantly increased in these patients and strongly affected liver function.

Elevated levels of transaminase enzymes in COVID-19 patients may be due to direct viral injury or other extrahepatic conditions. This can specifically explain the increase in AST levels. These elevated levels suggest that COVID-19 affects the catbolic and anabolic activities of the liver through hepatocyte injury. Hepatocyte dysfunction can cause a poor response to infection because there is a decrease in the synthesis of proteins that are important in fighting infection. This leads to suppressed immune status which makes the patient susceptible to secondary bacterial infections. Secondary bacterial infection can increase mortality and disease severity in 19 COVID-19

patients (Boregowda, 2020). But also need to know is this enzyme increase caused by liver dysfunction directly correlated with viral exposure in COVID-19 patients. Extrahepatic sources such as muscle injury can also cause an increase in AST and ALT. (Therefore, it is very important to differentiate AST and ALT elevation due to muscle injury from liver injury due to COVID 19 (Boregowda, 2020).

Clinical implications of ALT examination according to guidelines The clinical interpretation issued by the Ministry of Health is that it occurs in hepatocellular disease, active cirrhosis, biliary obstruction and hepatitis, obesity, acute lymphoblastic leukemia (ALL), consumption of drugs that increase serum transaminases such as Acetaminophen, Co-amoxylate, HMGCoA reductase inhibitors, INH, Nonsteroidal anti-inflammatory drugs, Phenytoin, and Valproate. The elevation value corresponding to this is an increase of two times the normal limit. (Ministry of Health RI, 2011)

Abnormalities in liver function tests in patients with COVID-19 can be caused by several mechanisms or various factors. SARS-CoV-2 binds to target cells via angiotensin-converting enzyme 2, which occurs abundantly in liver and epithelial cells biliary. Thus, the liver is a potential target for detecting infections and abnormalities in liver function tests may be due to a direct viral induced cytopathic effect.(Piano). Although some postmortem histopathological studies have demonstrated the presence of the viral genome in the liver, but other studies have not confirmed these results. However, impaired immunity from the resulting inflammatory response is a potential concurrent or alternative mechanism by which this disease can lead to liver damage. (Piano,2020)

Research shows that patients with abnormal liver function tests have more severe systemic inflammation characterized by elevated leukocyte, neutrophil, C-reactive protein and ferritin values.

CONCLUTION

Based on the research results, For Covid-19 patients it is recommended that you stay check the levels of AST and ALT in handling because very useful in determining the etiology and assess disease prognosis and evaluate treatment, Share

The public is strongly encouraged to follow the directions of the government local, namely by complying with implementation of the 3 M . Health Protocol or 5 M in daily activities outside the home in order to reduce risk of exposure to Covid-19, For researchers then it is recommended to do research using data more and more complete as well use more data analysis complex related to the factors that affect the results of the examination.

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Table 4.1. Distribution of the frequency of Covid-19 patients based on the age variable.

Age (Year)	N	%
6 – 24	18	18
25 – 43	42	42
44 – 62	31	31
63 - 81	9	9
Total	**100**	**100**

Source : Secondary Data, 2020

Table 4.2. Distribution of the frequency of Covid-19 patients with sex variables

Gender	N	%
Man	51	51
Woman	49	49
Total	**100**	**100**

Source : Secondary Data, 2020

Table 4.3. Distribution of the frequency of Covid-19 patients based on the results of AST levels.

AST Level	N	%
Normal	74	74
Abnormal	26	26
Total	**100**	**100**

Source : Secondary Data, 2020

Table 4.4. Distribution of the frequency of Covid-19 patients based on the results of ALT levels.

ALT Level	N	%
Normal	72	72
Abnormal	28	28
Total	**100**	**100**

Source : Secondary Data, 2020

Table 4.5. Distribution of the frequency of AST levels based on the variable Age

Age (Year)	AST Level			
	Normal		Abnormal	
	N	%	n	%
6 - 24	15	15	3	3
25 - 43	30	30	12	12
44 - 62	22	22	9	9
63 - 81	7	7	2	2

Source : Secondary Data, 2020

Table 4.6. Frequency distribution of ALT levels based on the variable age

Age (Year)	ALT Level			
	Normal		Abnormal	
	N	%	n	%
6 - 24	14	14	4	4
25 - 43	29	29	13	13
44 - 62	21	21	10	10
63 - 81	8	8	1	1

Source : Secondary Data, 2020

Table 4.7. Frequency distribution of AST levels by Gender

Gender	AST Level				*p value*
	Normal		Abnormal		
	n	%	N	%	
Man	35	35	16	16	0,211
Woman	39	39	10	10	

Source : Secondary Data, 2020

Table 4.8. Frequency distribution of ALT levels by Gender

Gender	ALT Level				*p value*
	Normal		Abnormal		
	n	%	N	%	
Man	35	35	16	16	0,011
Woman	39	39	10	10	

Source : Secondary Data, 2020