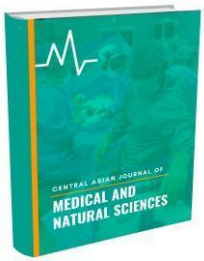

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Article

The Significance of Aspartate Transaminase and Alanine Transaminase Levels in Diagnosis and Management of Hepatitis Virus-related Liver Diseases with Hepatitis C Patients in Thi-Qar province, Iraq

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Abstract: Backround : The global spread of hepatitis C infection is concerning. Hepatitis C is a liver-damaging viral infection. It is brought on by the hepatitis C virus and, if untreated, can result in cirrhosis, liver damage, and even liver cancer. Contact with contaminated blood, such as sharing needles or getting a blood transfusion, is typically how the virus is transmitted. The infection can be treated with antiviral drugs. Liver cells are the primary location for the enzymes AST (aspartate aminotransferase) and ALT (alanine aminotransferase). A blood test measures two liver enzymes, AST and ALT, to assess the condition of your liver. A liver issue is generally indicated by elevated AST and ALT levels. Healthcare professionals can order additional tests and make an educated guess as to the underlying cause of the liver problem based on which enzyme is elevated or if both are elevated. This could aid in the diagnosis of conditions ranging from liver cancer and liver failure to cirrhosis and hepatitis. The purpose of the current study was to evaluate the association between hepatitis C patients and the liver enzymes aspartate transaminase and alanine transaminase. **Methods**: Patients serums of 40 HCV positive was taken out and 40 healthy HCV negative as controlling groups and examined for ALT and AST analytical measurement. Cross-sectional study was directed from December 2022 to March 2023 in Thi-Qar government, Iraq. **Results**: Participants age ranged between ≥15 to ≤ 75 years , AST have increased levels in HCV patients as compared to ALT as compared with controlling group . study gender-based shows an increased level of both the enzymes ALT and AST in females as compared to males .age-based study concluded ALT and AST have a non-significant level in age groups > 49 Years in HCV patients. **Conclusion** : study gender-based shows an increased level of both the enzymes ALT and AST in females as compared to males. Moreover, gender-based study concluded ALT and AST have a non-significant level in age groups > 49 Years in HCV patients . AST have increased levels in HCV patients as compared to ALT indicating AST to be more specific biomarker of HCV infection and liver damage. **Recommendation** : The research advised against coming into close touch with blood. Never share anything that could have other people's blood on it, even if it seems clean, to lessen the possibility of blood-to-blood contact. The virus may be present even in a dried patch of blood that is too tiny to be seen.

Keywords: Aspartate Transaminase , Alanine Transaminase Enzymes , Hepatitis C and patients

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1. Introduction

Hepatitis refers to liver inflammation. Toxins, certain medicines, excessive alcohol use, as well as bacterial and viral infections, may all lead to hepatitis.

A viral illness known as hepatitis C damages the liver. If left untreated, it is brought on by the hepatitis C virus and may result in liver damage, cirrhosis, and even liver cancer. Until 1992, obtaining a blood transfusion or sharing needles were two common ways for the virus to be transmitted. Hepatitis C does not have a vaccination, however antiviral drugs may be used to treat the virus.

AST and ALT levels in the blood may rise as a result of hepatitis C infections. Elevated AST and ALT values, however, may not always indicate the presence of the hepatitis C virus. Other factors might include illnesses, drugs, or alcohol-related liver impairment. As a result, a blood test for the hepatitis C virus should be performed together with additional tests to ascertain the origin of increased AST and ALT values.

Concerns regarding the chronic hepatitis C virus (HCV) are becoming more widespread. HCV can only be acquired by contact with tainted blood since it cannot be transmitted through healthy skin or mucous membranes [1]. Around 170 million people worldwide have chronic HCV infection, with 3–4 million new cases each year. According to estimates, 30% of HCV-infected individuals are unaware that they have the virus. Around 350,000 deaths each year are expected to be caused by HCV [2].

The population groups most at risk of contracting HCV are those born between 1950 and 1970, current or former intravenous drug users (IDUs), children born to mothers who have the disease, prisoners, hemodialysis patients, indigenous peoples, citizens of countries with a high prevalence of the disease, and people who received blood, blood products, or organs before July 1992 [3-5].

Determination of Serum AST (GOT) and ALT (GPT) Despite the fact that they are also present in muscle, the pancreas, the kidneys, and red blood cells, "The liver contains the enzymes aspartate aminotransferase (AST) and alanine aminotransferase (ALT). GOT (serum glutamic oxaloacetic transaminase) and GPT (serum glutamic pyruvic transaminase) were the previous names for AST and ALT, respectively ". AST or ALT results are often used to diagnose liver disease. Despite not being specifically for liver disease, it may be used with other enzymes to monitor the emergence of various liver issues. Normal blood levels of AST and ALT are 5 to 40 U l-1 and 5 to 35 U l-1, respectively. However, when an organ or piece of biological tissue, such as the liver or heart, is unwell or injured, more AST and ALT are released into the circulation, which increases the quantity of the enzyme Thus, There is a significant relationship between the degree of tissue damage and the levels of AST and ALT in the blood. While ALT levels may also rise, significant damage causes AST levels to increase by 10 to 20 times normal levels (up to 50 times greater than normal). Nevertheless, the ratio of AST to ALT (AST/ALT) may sometimes be used to identify if the liver or another organ has been impacted. [6-9].

ALT and AST are distributed in the hepatocytes in distinct ways. ALT is mostly found in liver cells' cytoplasm. ALT initially leaks into the circulation in the event of even little liver cell injury, causing the serum GPT to rise. The AST is mostly found in the "mitochondria" of liver cells, which are "bubbles" in the cytoplasm of the liver cell. AST does not leak into the circulation in the event of minor liver cell injury [10-11]

because there are few studies in the recent years were done , therefore the aim study has been designed to evaluate hepatitis C patients by studying liver enzymes such as AST and ALT parameters and compared with healthy enzymes as control .

2. Materials and Methods

Study design is Cross-sectional study was directed from December 2022 to March 2023 in Dhi-Qar government, Iraq.The patients in this study were divided on depend the age and gender and compared with Healthy peoples , Study Area are done in four educational, four general hospitals and one specific center in Dhi-Qar government, Iraq. According to the information from the Dhi-Qar Health director Research setting and time

The study was approved out in hospitals affiliated with the Dhi Qar Health Department, which contain gastrointestinal unit for the period from December 2022 to March 2023. A total number of 40 hepatitis C virus (HCV) patients (men 20) and (women20) were included in this study and 40 healthy diagnosed negatives hepatitis C virus .
The study was relies on the collection a blood samples from hepatitis c patients of different gender and different ages and compared with AlT and Ast Enzyme of Healthy peoples as control, the sample of the study in the practical aspect of it, and it relied on solid scientific sources in preparing the theoretical side of it as showed in a table Number 1.Research instrument :The study relied on the clinical laboratories of hospitals and Al nahreen lab in Al Nasiriya City through the practical work determining the value of AlT and Ast Enzyme in blood samples for patients and healthy.

3. Results

The results of the data analysis are presented in this chapter methodically in tables and are in line with the following research goals: The research comprised 40 hepatitis C virus (HCV) patients—20 men and 20 women—as well as 40 healthy people who had been tested negative for the disease. served as the control group. research comparing patients to the control group Aspartate transaminase and Alanine transaminase, two liver enzymes, are linked to hepatitis C, according to a (figure No 1-6 and table No 1-5).

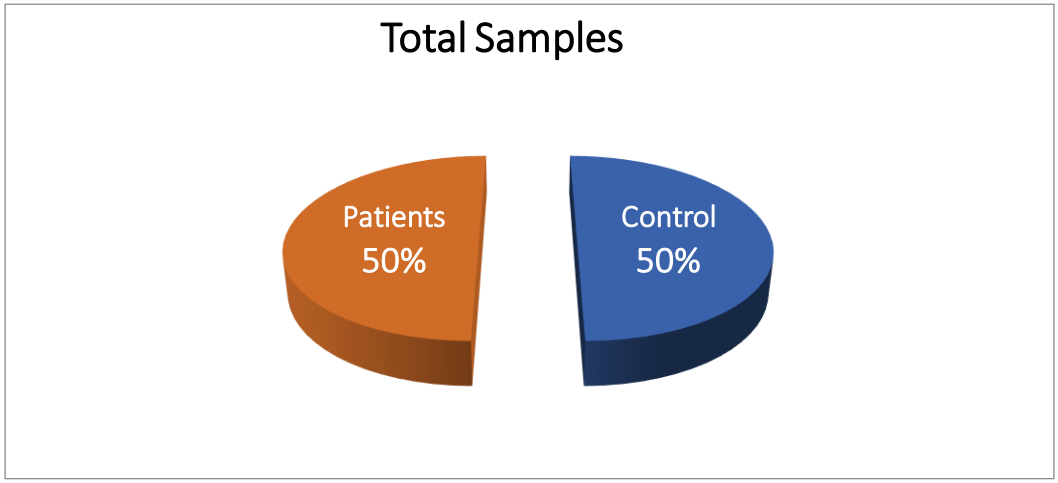
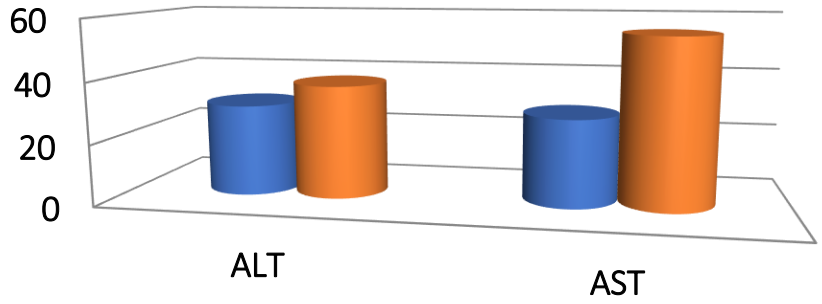


Figure No 1 : Comparison between percentage of hepatitis C group and control group



	ALT	AST
Control	30,03	28,71
Patients	37,3	55,15

Figure No 2 : Comparison between mean and SD of ALT and AST between Patients group and control group

Table 1 shows a significant value of ALT in the Patients group as compared with the control group and higher significant value AST in the Patients group as compared with the control group .

Groups Statistic				
Parameters	**Groups**	**N**	**Mean & Std. Deviation**	**T. test**
ALT	**Patients**	40	37.30±4.027	0.037*
	Control	40	30.03±13.89	
AST	**Patients**	40	55.15±9.761	0.001**
	Control	40	28.71±15.65	

Table 1: Comparison between mean and SD of ALT and AST between Patients group and control group

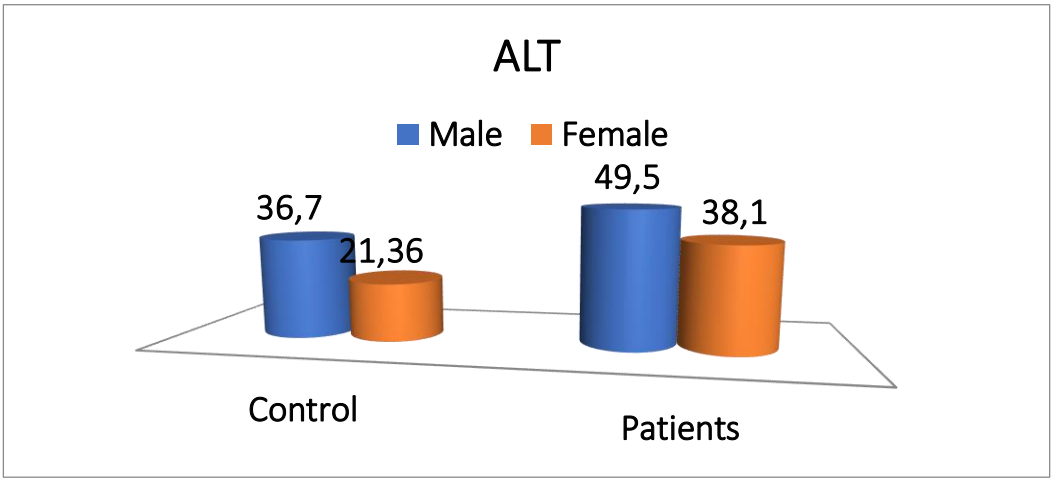


Figure No 3 : Comparison between ALT of Male and Female of Patients group and control group .

Table 2 shows significant value of ALT in the Male Patients group as compared with the Male control group and higher significant value ALT in the Female Patients group as compared with the Female control group .

ALT			
Groups	**Gender**	**Mean & Std.**	**P. value**
Male	**Patients**	49.50±3.77	0.048*
	Control	36.70±9.89	
Female	**Patients**	38.10±4.30	0.002**
	Control	21.36±7.18	

Table 2: Comparison between mean ,SD and P. value of ALT between Patients group and control group

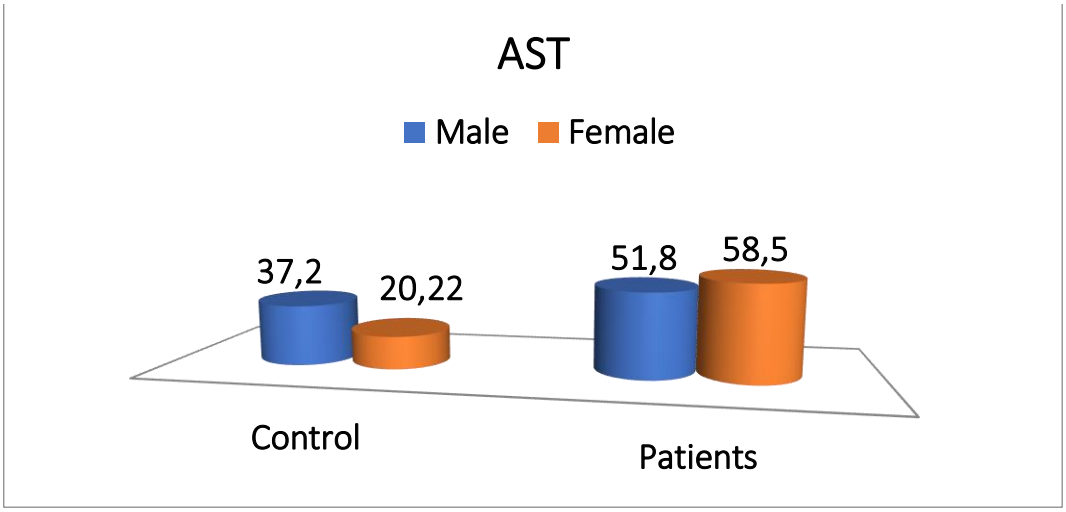


Figure No 4 : Comparison between AST of Male and Female of Patients group and control group .

Table 3 shows significant value of AST in the Male Patients group as compared with the Male control group and higher significant value AST in the Female Patients group as compared with the Female control group .

AST			
Groups	**Gender**	**Mean & Std.**	**P. value**
Male	**Patients**	51.80±8.45	0.049*
	Control	37.20±18.2	
Female	**Patients**	58.50±10.2	0.001**
	Control	20.22±6.17	

Table 3: Comparison between mean ,SD and P. value of AST between Patients group and control group

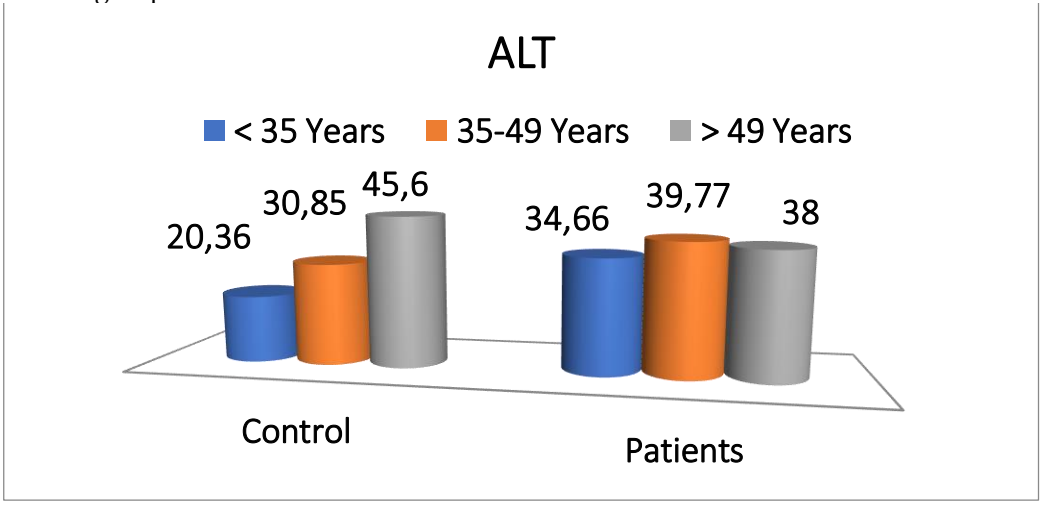


Figure No 5 : Comparison between ALT for different ages of Patients group and control group .

Table 4 shows Higher significant value of age groups < 35 Years , shows Higher significant value of age groups 35-49 Years and non-significant value of age groups > 49 Years for ALT in the Patients group as compared with the control group .

ALT			
Groups	**Patients**	**Control**	**T. test**
Age Groups	**Mean & Std.**	**Mean & Std.**	**P. value**
< 35 Years	34.66±4.41[a]	20.36±9.65	0.002**
35-49 Years	39.77±1.78[b]	30.85±7.56	0.004**
> 49 Years	38.00±2.82[ab]	45.60±7.45	0.278
ANOVA P. value of (Age Groups) in Patients	**0.016*** **LSD value (a,b) 0.005****		

Table 4: Comparison between mean ,SD and P. value of AST for different ages between Patients group and control group

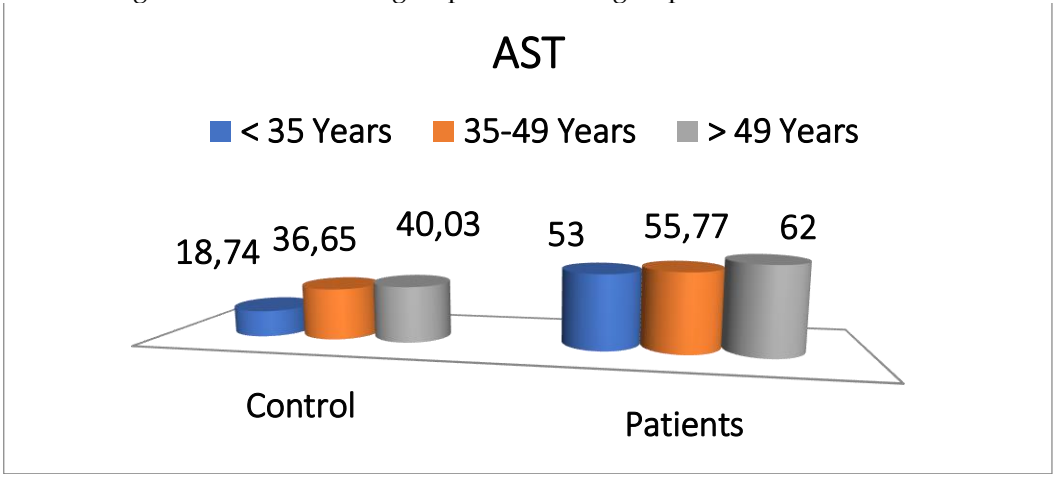


Figure No 5 : Comparison between ALT for different ages of Patients group and control group .

Table 4 shows Higher significant value of age groups < 35 Years , shows Higher significant value of age groups 35-49 Years and non-significant value of age groups > 49 Years for ALT in the Patients group as compared with the control group .

AST			
Groups	**Patients**	**Control**	**T. test**
Age Groups	**Mean & Std.**	**Mean & Std.**	**P. value**
< 35 Years	53.00±8.32	18.74±5.56	0.001**
35-49 Years	55.77±9.52	36.65±16.3	0.045*
> 49 Years	62.00±19.7	40.03±20.0	0.315
ANOVA P. value of (Age Groups) in Patients	**0.507**		

Table 5: Comparison between mean ,SD and P. value of ALT for different ages between Patients group and control group.

4. Discussion

The Liver Enzymes Aspartate transaminase and Alanine transaminase used in this study were A total number of 40 hepatitis C virus (HCV) patients (men 20) and (women 20) were

included in this study and 40 (men 20) and (women 20) healthy diagnosed negatives hepatitis C virus. Were taken as a control group in Thi –Qar Provence –Iraq because of the availability as showed in a figure No1 Comparison between percentage of hepatitis C group and control group .

Liver cells are the primary location for the enzymes aspartate aminotransferase and alanine aminotransferase. These enzymes may seep into the bloodstream as a result of damaged or inflamed liver cells, which would raise their levels in blood tests. The present study concluded that there is Relationship Between Liver Enzymes ASTand ALT with Hepatitis C. The study revealed there are effects on liver function tests due to the patients have significant effect on ALT test and higher significant effect on AST test as compared with the control group[1]. The study used the gender for revealed is Relationship Between Liver Enzymes AST and ALT with Hepatitis C .the study demonestrate In hepatitis C, both AST and ALT levels can be elevated, but the degree of elevation can vary from person to person .The study observed there are mild effects on liver function tests in Male Patients due to significant effect of Alanine transaminase ALT test and mild significant effects in Aspartate transaminase AST as compared with the control group. [15] While there are higher effects on liver function tests in female Patients due to higher-significant effect of ALT test and AST as compared with the control group .[7]

In hepatitis C, both AST and ALT levels can be elevated, but the degree of elevation can vary from person to person .the severity of liver damage and the stage of the disease which could affect AST and ALT levels. 6Both men and women can experience elevated AST and ALT levels in hepatitis C. However, there are may be differences in the degree or pattern of liver damage between men and women, the Factors such as individual variations in metabolism and immune response can all influence AST and ALT levels .[10] Anna Ruggieri et al.2018 have been concluded in his study there is direct and diverse effects of male and female sex hormones on replication of virus genome HCV act jointly to the effect of sex hormones on the anti-viral immune response. Duration use the age of the patients to study concluded there are higher effect on the liver function tests in the age groups < 35 and < 35-49 Years due to higher-significant effect of ALT test and AST test as compared with the control group , While in age groups > 49 Years there are no effect on the liver function due to Non-significant effect of ALT test and AST test as compared with the control group. [16]

The present study found that the resulted a of mean and Std Deviation significant elevation value ALT and higher significant value of of AST in Patients group than that of the control group as showed in a table No 1 and Figure No 2 . Comparison between mean and SD of ALT and AST between Patients group and control group he importance of the results of this study as showed in Table 2 and Figure No 3 Comparison between mean ,SD and P. value of ALT between Patients group and control group. Found that there are significant value of ALT in Male Patients group and found there are higher significant value of ALT in the Female Patients group than that of the control group. [12]

5. Conclusion

It is important to note that high levels of AST and ALT alone are not diagnostic of hepatitis C. Further testing, such as a viral load test or liver biopsy, may be needed to confirm the diagnosis and determine the extent of liver damage. Treatment for hepatitis C and other non-hepatitis viruses may include lifestyle changes as well as liver function tests. The study concluded that there is a difference in the extent of liver enzymes affected depending on the age and gender of the patient as well as the amount of viral dose to which the patient was exposed, which may lead to liver cell damage and thus the release of large amounts of AST enzymes when they enter the bloodstream.

Recommendation :

The major way that HCV spreads is via blood-to-blood contact. In other words, if a person who does not have HCV has their blood exposed to the blood of a person who has, then the individual will get HCV. The study recommends The easiest strategy to avoid contracting HCV is to stay away from direct blood contact. Never share anything that may have other people's blood on it, even if it seems clean, to lessen the possibility of blood-

to-blood contact. The virus may be present in even a dried blood spot that is too tiny to be seen.

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