

SCREENING FOR THE LEVEL OF SPECIFIC BIOCHEMICAL MARKERS (GOT, GPT) IN PEOPLE WHO ARE ADDICTED TO ALCOHOL

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ABSTRACT

This study was aimed to estimate the level of specific biochemical markers (GOT, GPT) in blood serum of individuals who are addicted to alcohol. For this purpose, a total of 200 normal individuals in two groups (100 each) were included; The first composed of those individuals who are addicted to alcohol, while the other group contained those individuals who were not drink alcohol. All individuals were subjected to two liver markers [Glutamic oxaloacetic transaminase (GOT) and Glutamic pyruvic transaminase (GPT)] analysis. Results showed that higher (GOT) and (GPT) levels (in significant differences) were recorded in the first group of individuals

who are addicted to alcohol as compared to other group.

KEYWORDS: Glutamic Oxaloacetic Transaminase (GOT), Glutamic Pyruvic Transaminase (GPT), Liver.

1. INTRODUCTION

Liver is a largest organ in the body, it weighs about a kilo and a half and its color is red brown. It is located in the right side of the abdominal cavity under the diaphragm. The liver has two large sections, called the right and the left lobes. The gallbladder sits under the liver, along with parts of the pancreas and intestines. The liver and these organs work together to digest, absorb, and process food.

The main job of the liver is to filter the blood coming from the digestive tract, before passing it to the rest of the body. The liver also makes proteins important for blood clotting and other functions.^[1]

Liver plays a key role in metabolism and a number of body functions such as detoxification and acts as the storage of glycogen and a center for manufacturing proteins coming (plasma) vessels.^[2]

The liver is our largest internal organ and it has 500 different roles, including the breakdown of food into energy and helping the body get rid of waste products and fight infections.^[3]

A hepatocyte is the main tissue cell of the liver and makes up 70–80% of the liver's cytoplasmic mass. Hepatocytes contain large amounts of rough endoplasmic reticulum and free ribosomes. Hepatocytes are involved in:

1. Protein synthesis.
2. Protein storage.
3. The transformation of carbohydrates.
4. The synthesis of cholesterol, bile salts, and phospholipids.
5. The detoxification, modification, and excretion of exogenous and endogenous substances.

The types of liver disease^[4,5]

There are many types of liver disease, the most common are:

1. Alcohol-related fatty liver-disease

Where the liver is damaged after alcohol abuse.

2. Non-alcoholic fatty liver disease

A build-up of fat within liver in liver cells.

3. Viral (Hepatitis)

An inflammation (swelling) of the liver caused by a viral infection.

4. Autoimmune (chronic hepatitis)

Severe form of hepatitis where blood cells attack and destroy liver cells.

All types of liver disease above can cause damage to the liver.

Drinking alcohol can increase your risk of developing liver disease and cause irreparable damage to this very important part of your body.^[6]

Alcohol-related liver disease can be prevented if you understand the impact excessive alcohol drinking can have on your liver and take-steps to control the amount you drink.

How does alcohol impact the liver?

Liver disease is the term used to describe damage to the liver. There are two types of liver disease:

- 1- Acute is when liver problems develop over a few months.
- 2- Chronic is damage over a number of years.^[7]

There are lots of different causes of liver disease, including drinking alcohol to excess which causes 'alcoholic liver disease'. The reasons include:

- 1- Oxidative stress. When the liver tries to break down alcohol, the resulting chemical reaction can damage its cells. This damage can lead to inflammation and scarring as the liver tries to repair itself.
- 2- Toxins in gut bacteria. Alcohol can damage the intestine which lets toxins from gut bacteria get into the liver. These toxins can also lead to inflammation and scarring. Drinking alcohol can increase the risk of developing liver disease.^[8,9]

Cirrhosis is a late stage of scarring (fibrosis) of the liver caused by many forms of liver diseases and conditions, such as hepatitis and chronic alcoholism. The liver carries out several necessary functions, including detoxifying harmful substances in the body, cleaning the blood and making vital nutrients. The main causes are sustained, excessive alcohol consumption, viral hepatitis B and C, and fatty liver disease. However, there are other possible causes.

Toxins, including alcohol, are broken down by the liver. However, if the amount of alcohol is too high, the liver will be overworked and liver cells can eventually become damaged.

Heavy, regular, long-term drinkers are much more likely to develop cirrhosis, compared with other, healthy people. Typically, heavy drinking needs to be sustained for at least 10 years for cirrhosis to develop.^[10]

Liver enzymes

Aspartate aminotransferase (AST, EC 2.6.1.1) and alanine aminotransferase (ALT, EC 2.6.1.2) are enzymes found mainly in the liver, but also found in red blood cells, heart cells, muscle tissue and other organs, such as the pancreas and kidneys. AST and ALT formerly are called serum glutamic oxaloacetic transaminase (GOT) and serum glutamic pyruvic transaminase (GPT), respectively.^[11,12] AST or ALT levels are a valuable aid primarily in the

diagnosis of liver disease. Although not specific for liver disease, it can be used in combination with other enzymes to monitor the course of various liver disorders. The normal concentrations in the blood are from 5 to 40 U I⁻¹ for AST and from 5 to 35 U I⁻¹ for ALT. However, when body tissue or an organ such as the liver or heart is diseased or damaged, additional AST and ALT are released into the bloodstream, causing levels of the enzyme to rise. Therefore, the amount of AST and ALT in the blood is directly related to the extent of the tissue damage. After severe damage, AST levels rise 10 to 20 times and greater than normal, whereas ALT can reach higher levels (up to 50 times greater than normal). On the other hand, the ratio of AST to ALT (AST/ALT) sometimes can help determine whether the liver or another organ has been damaged.^[13,14]

2. MATERIALS AND METHODS

The values of GOT and GPT were estimated in the serum of two groups of the normal individual; each group with 100 individuals. First group included those who are addicted to alcohol, the other group those not drink alcohol.

2.1. Sampling

A total of 200 normal individual; 100 of them are addicted to alcohol, while the other 100 were not drink alcohol. 5-10 ml of blood samples (in disposable tubes) were taken. The samples were left to stand at room temperature (24-25⁰C) for clotting. Sera were separated by centrifugation at 3000 rpm for 5 minutes. The essential reagents required for a chemiluminescence immunoassay include antibody, enzyme-antigen conjugate, native antigen and a substrate that produces light.

2.2. Determination of GOT and GPT

The values of GOT and GPT were estimated in the serum of two groups of the normal individual; each group with 100 individuals. First group included those how were addicted to alcohol, the other group those were not drink alcohol. Serum is pipette out into assigned wells and a working tracer reagent solution is added to it followed by swirling. The specific antibody conjugate solution is added. After swirling and incubation wash buffer is added and decanted several times. Then working reagent solution is added to each well and incubated. The relative light in each well is read within 30 min of adding substrate solution.

3. RESULT AND DISCUSSIONS

The values of Glutamic Oxaloacetic Transaminase (GOT) and Glutamic Pyruvic Transaminase (GPT) were estimated in the serum of two groups of the normal individual ; each group with 100 individuals. First group included those how were addicted to alcohol, the other group those were not drink alcohol. Results showed that higher (GOT) and (GPT) levels (in significant differences as showing in table 3.1) were recorded in the first group as compared to other group.

Normal value : (GOT=5-34 U/L), (GPT=0-55 U/L)

Table 3.1: Statistical analysis values of Serum GOT and GPT level.

| Chemical parameters | Taken alcohol Mean \pm SE | No alcohol Mean \pm SE |
|---------------------|--------------------------------|-----------------------------|
| GOT | 63.94 \pm 4.90 | 21.13 \pm 27.24 |
| GPT | 66.80 \pm 6.30 | 40.98 \pm 2.00 |
| t-test | 7.224 | 4.974 |
| P-value | 0.000** | 0.000** |

Significant differences $p \leq 0.05^*$, $p \leq 0.01^{**}$, non- significant $p > 0.05$

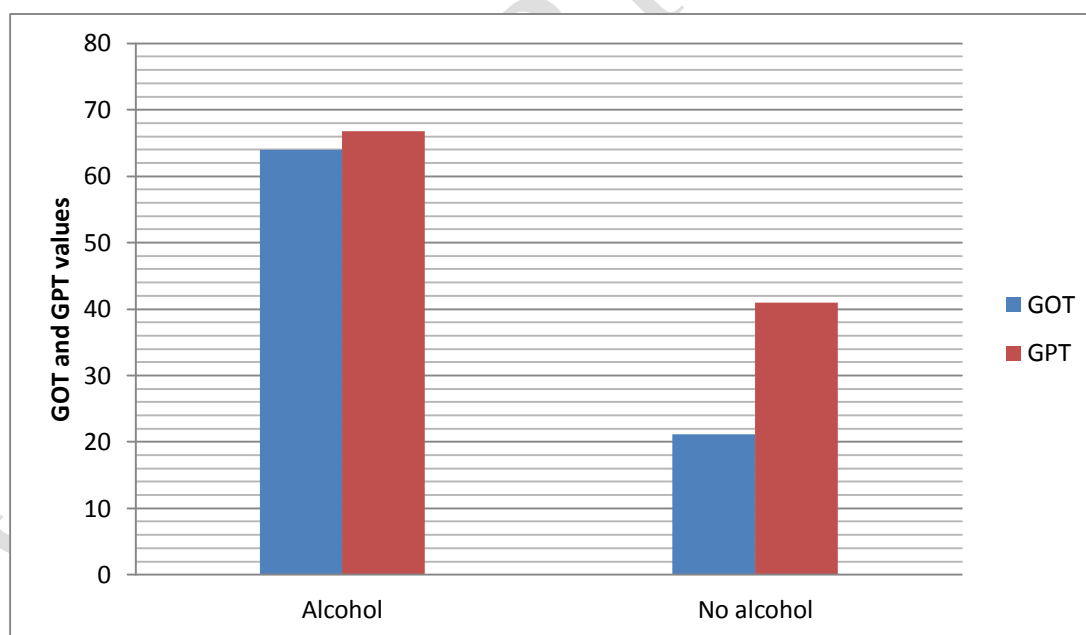


Fig 3.1: Serum GOT and GPT levels.

1- GOT marker study on the two groups.

Reference Range: (GOT=5-34 U/L)

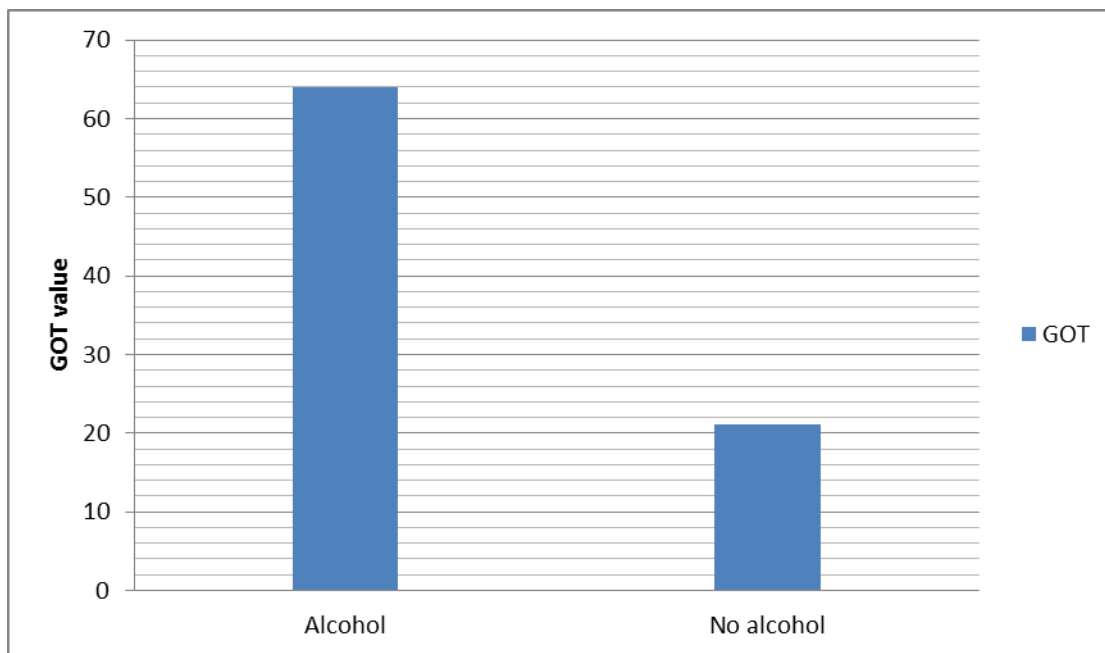


Fig 3.2: Serum GOT level.

1- GPT marker study on the two groups.

Reference Range: (GPT=0-55 U/L)

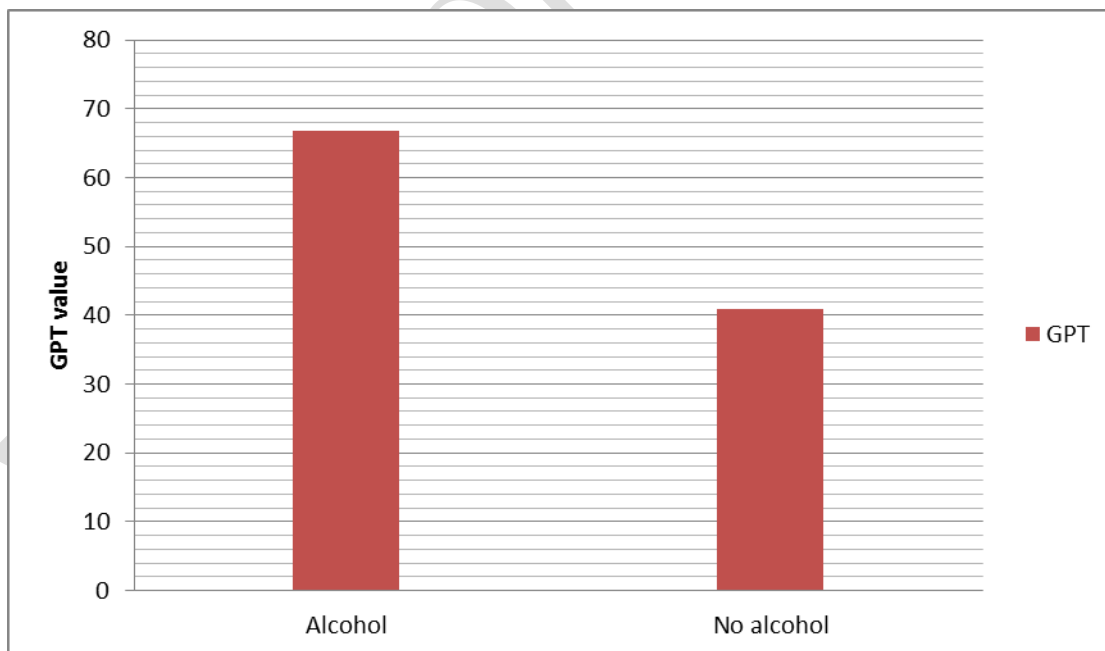


Fig 3.3: Serum GPT level.

Drinking alcohol can increase your risk of developing liver disease. Toxins, including alcohol, are broken down by the liver. However, if the amount of alcohol is too high, the liver will be overworked and liver cells can eventually become damaged.\

The ratio of liver metabolism in first group much higher than second group because the high level of alcohol in the first group which are taken by first group so the results showed that higher (GOT) and (GPT) levels (in significant differences) were recorded in the first group as compared to other group.

Statistical Analysis

Statistical analysis was done using SPSS version 21 computer software (statistical package for social sciences) and Microsoft Office Excel (Microsoft Office Excel for windows; 2010). Data were analyzed by using t-test (independent t-samples t-test) used to value significant difference among means. $P \leq 0.05^*$, $p \leq 0.01^{**}$ was considered statistically significant, while $p > 0.05$ was considered non-significant.

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