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RESEARCH ARTICLE

SCREENING FOR THE LEVEL OF SPECIFIC BIOCHEMICAL MARKERS (GOT, GPT) IN BODYBUILDING ATHLETES IN A SPORT COURTS IN BAGHDAD.

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Key words

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

Abstract

This study was aimed to estimate the level of specific biochemical markers (GOT, GPT) in blood serum of bodybuilding athletes referring to a sport court in Bagdad. For this purpose, a total of 100 athletes divided in two groups (50 each) were included; The first composed of those taken activators, while the other group contained those normal who were not taken any activators. All athletes 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 athletes as compared to other group.

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Introduction

The liver is located in the upper right-hand portion of the abdominal cavity, beneath the diaphragm and on top of the stomach, right kidney, and intestines. The liver, a dark reddish-brown organ, has multiple functions.

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⁽¹⁾.

Liver enzymes

Elevated liver enzymes may indicate inflammation or damage to cells in the liver. Inflamed or injured liver cells leak higher than normal amounts of certain chemicals, including liver enzymes, into the bloodstream, which can result in elevated liver enzymes on blood tests⁽²⁾. 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. 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 l⁻¹ for AST and from 5 to 35 U l⁻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^(1,4). AST and ALT are also biological catalyst^(2,5).

Liver function test (LFT)^(6,7)

1. Serum Glutamic – Pyruvic Transaminase (SGPT /ALT)

Is specifically associated with the liver cells only SGPT / ALT levels increase with liver "cell inflammation"

2. Serum Glutamic – Oxaloacetic Transaminase (SGOT / AST)

Associated with liver, brain and heart tissues SGOT / AST is associated with "cell necrosis"

3. Serum Gamma – Glutamyl Transferase (SGGT)

Associated with: Alcoholism or Biliary stasis^(6,7). These enzymes increased from normal levels, caused this problem in the liver, may rise enzymes ratio as a result of acute or chronic disease or what is known mental liver disease, in humans as a result of a rise in weight or alcoholic illness sugary also, some types of drugs cause elevated liver enzyme levels, as drugs that lower cholesterol, and these enzymes rise as a result of poisoning drug security or overdose of acetaminophen, or inflammation of the liver disease which cause the manifold increase in liver enzymes⁽⁸⁾.

Other diseases that may cause elevated liver enzymes, diseases such as alcoholic liver, fever inflated cells and diabetes monocytes nucleus is working to increase these enzymes, and so on for viral (c-b), causing increase in liver enzymes times of times, and that genetic factors have significant role cannot be neglected in the control of the proportion of the enzymes in the blood⁽⁹⁾.

1. Increase the amount of fat accumulated on the liver.
2. Eating specialized medicine in the treatment of cholesterol.
3. Diabetes.
4. Poor diet follow.
5. Alcohol intake.
6. As a result of infection with HIV and hepatitis C it is the height of enzymes is very high.
7. Losing weight rapidly⁽¹⁰⁾.

Ammonia detoxification in liver⁽¹¹⁾

Ammonia is rapidly removed from the circulation in the liver, converted into a water soluble compound known as urea. Ammonia is toxic to the CNS because it reacts with the α -ketoglutarate to form glutamate. As a consequence, the depleted levels of α -ketoglutarate impairs the function of the Citric Acid cycle in neurons, depriving them energy production. Furthermore, glutamate is a potent CNS neurotransmitter, thus any significant increase in the concentration of glutamate could have abnormal effects in synaptic transmission.

Urea cycle regulation

Urea cycle is regulated by the rate limiting enzyme carbamoyl phosphate synthase I, the first enzyme of the ammonia detoxification pathway. It is only active in presence of its allosteric activator N-methyl-glutamate amino acid. It catalyses the condensation of ammonium ions NH_4^+ , CO_2 and ATP to form carbamoyl phosphate, a product that will condense with L-ornithine in order to initiate the urea cycle.

Materials and Methods

The values of GOT and GPT were estimated in the serum of two groups of the bodybuilding athletes in a sport court in Bagdad; each group with 50 individuals . First group included those how were taken various type of activators, the other group those were taken no any types of activators.

Sampling

A total of 100 bodybuilding athletes in a sport court in Bagdad; 50 of them taken various type of activators, while the other 50 were not taken such activators. 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 mints . The essential reagents required for an chemiluminescence immunoassay include antibody, enzyme-antigen conjugate, native antigen and a substrate that produces light.

Determination of GOT and GPT

The values of GOT and GPT were estimated in the serum of two groups of the bodybuilding athletes in a sport court in Bagdad; each group with 50 individuals . First group included those how were taken various type of activators, the other group those were taken no any types of activators. 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 following which 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.

Result and Discussions

The values of GOT and GPT were estimated in the serum of two groups of the bodybuilding athletes in a sport court in Bagdad; each group with 50 individuals . First group included those how were taken various type of activators, the other group those were taken no any types of activators. Results showed that higher (GOT) and (GPT) levels (in significant differences as showing in table 3.1) were recorded in the first group of athletes as compared to other group. The reason of this result is the ratio of liver metabolism in first group much higher than second group because of the high concentration of activators (proteins and hormones) which are taken by first group.

The respective values are 5-34 U/L for GOT and 0-55 U/L for GPT

Chemical parameters	Taken activators	No activators
	Mean \pm SE	Mean \pm SE
GOT	54.94 \pm 4.30	1.13 \pm 27.24
GPT	66.80 \pm 6.30	37.98 \pm 1.90
t-test	6.224	4.374
P-value	0.000**	0.000**

Table 3.1 Significant differences of GOT and GPT values.

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

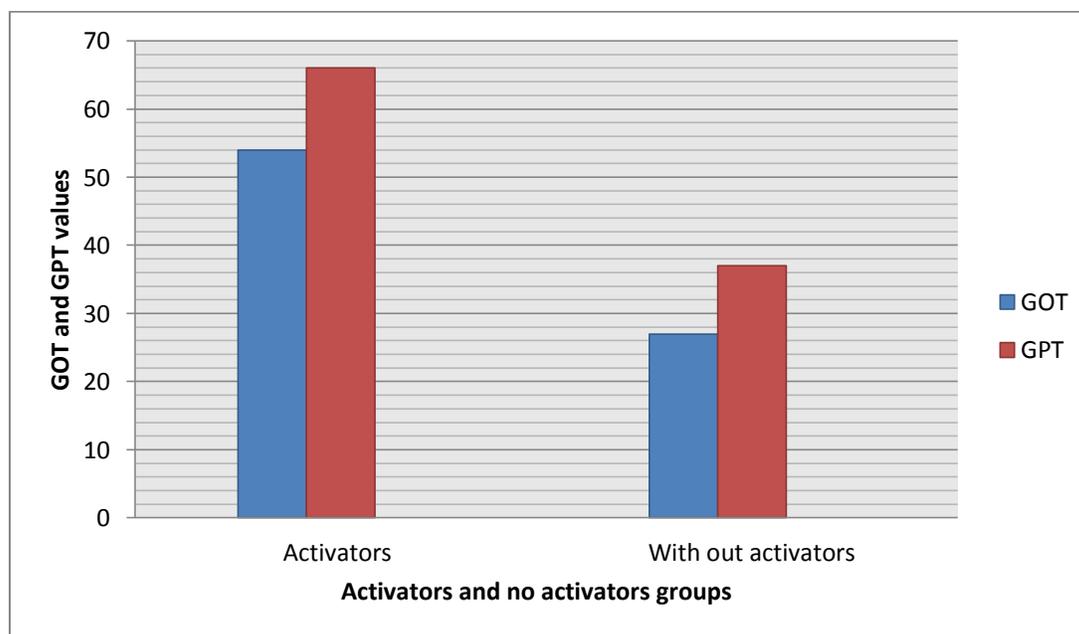


Fig 3.1 Serum GOT and GPT levels of two groups

1-GOT marker study on the two groups (with activators without activators)

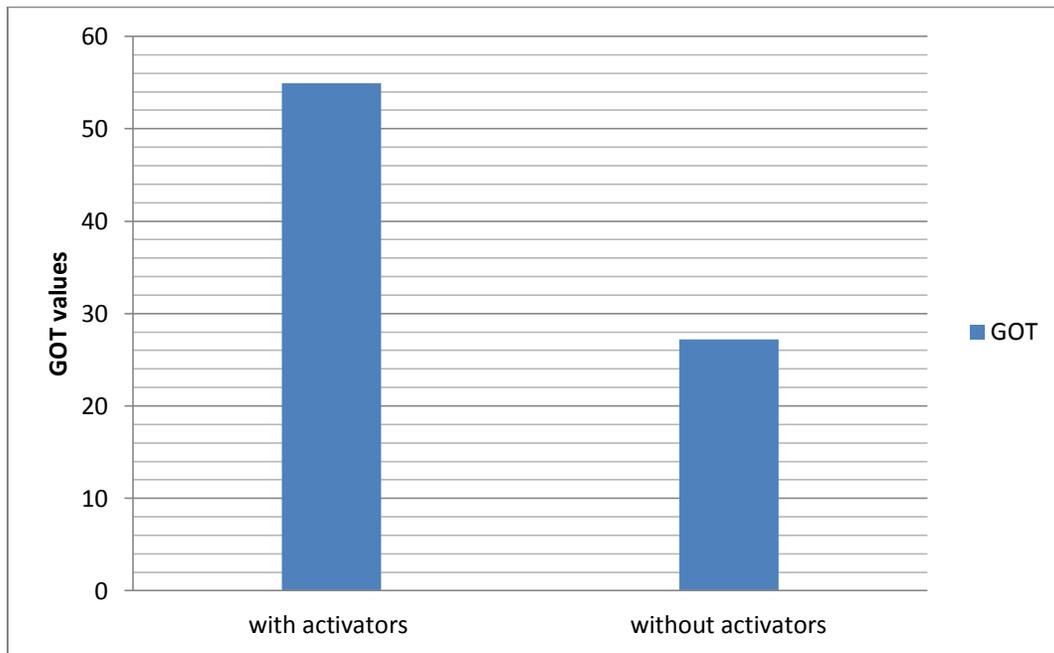


Fig 3.2 Serum GOT level of two groups.

1-GPT marker study on the two groups (with activators without activators)

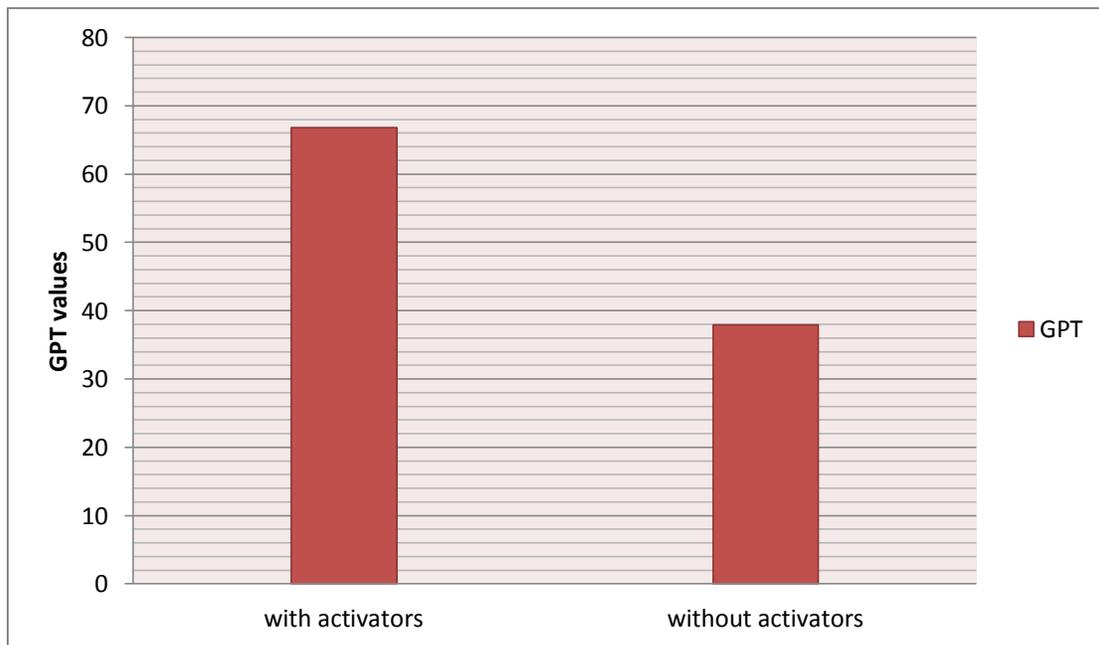


Fig 3.3 Serum GPT level of two groups.

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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