Liver, Kidney Function Enzymes and Biochemical Parameters Evaluation for Hepatitis B and C in Iraqi Patients

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Abstract

Hepatitis is inflammation of the liver tissue. Hepatitis is *acute* if it resolves within six months, and *chronic* if it lasts longer than six months. Acute hepatitis can resolve on its own, progress to chronic hepatitis, or (rarely) result in acute liver failure. Chronic hepatitis may progress to scarring of the liver (cirrhosis), liver failure, and liver cancer. As hepatitis B and C are transmitted through blood and multiple bodily fluids, prevention is aimed at screening blood prior to transfusion, abstaining from the use of injection drugs, safe needle and sharps practices in healthcare settings, and safe sex practices.This study aimed to assess the liver function enzyme and other biochemical test in Iraqi patients infected with Hepatitis B and C in addition to patient treated with silymarin drug. The results showed the ability of silymarin drug to decrease the elevated liver enzyme level of hepatitis B (137.52±5.71 *vs*. 350.19±2.15, 196.70±9.10 *vs*. 210.33±29.43 and 76.63±4.30 *vs*. 178.12±23.50)(U\L) for ALP, GPT and GOT respectively. The results of biochemical test matches the results of liver enzymes throught decreasing the level of treated patints (42.50±3.37, 1.13±0.06 and 2.81±0.68) (mg\dL) in compared to hepatitis patiens (66.01±1.7, 2.28±0.20and 5.16±0.28) (mg\dL) for blood urea, creatinin and total bilurbin respectively. The results indicated that hepatitis C patients suffred from elevated liver enzymes level compared to treated humans (347.41±2.15 *vs*. 207.25±11.94, 256.07±29.43 *vs*. 137.61±2.186 and 167.6±4 *vs*. 95.2±4.7Unit/L) or healthy humans(64.89±25.01, 39.43±12.10 and 35.56±12.59) U\L for ALP, GPT and GOT respectively and the biochemical test agreed with the previous results in which the level of treated humans decrease after treatment with silymarin in compaired to elevated level for hepatitis patients(42.01±3.72 *vs.* 66.01±1.70, 1.33±0.13 *vs.* 2.280±0.2 and 1.60±0.11 *vs.* 4.16±0.28) mg\dL for for blood urea, creatinin and total bilurbin respectively.

Keywords: *Iraqi patients; Hepatitis B and C; kidney Function Enzymes; Health*

Introduction

Hepatitis is the most common type of disease that occurs in the world and it is a state of inflammation of the liver due to a a variety of causes, of which viral infection is the most important, and leads to significant morbidity and mortality. Viral hepatitis is caused by infection with one of the five known viruses, which predominantly affect the liver ,where they A, B, C, D and E viruses[1,2] The hepatitis Viruses differ widely in their morphology, genomic Organization, taxonomic classification and modes of replication. [3] that's mean it may be caused by drugs, alcohol use, or certain medical conditions. The conditioning hepatitis can be self limiting or it can cause fibrosis i.e., scarring, cirrhosis or liver cancer. The group of viruses (hepatitis A, B, C, D and E) that cause acute and/or chronic infection and inflammation of the liver gives rise to a major public health problem globally. Hepatitis B and C viruses are major causes of severe illness and death. The global burden of disease due to acute hepatitis B and C and to cancer and cirrhosis of the liver is high (about 2.7% of all deaths) and is forecast to become a higher ranked cause of death over the next two decades.recent study founded that people were

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estimated to die from hepatitis C-related liver diseases each year(4). Hepatitis A and hepatitis E are emblematically induced by consumption of pestiferous water and food. Hepatitis B, hepatitis C and hepatitis D are ordinarily stimulated as an outcome of Parenteral, adjoin with infected bodily fluids. Usual modality of contagion for these viruses admits acknowledge of pestiferous blood/blood products, incursive medical procedures using befoul apparatus and for hepatitis B hauling from mother to child at birth, from clan members to adolescent and through erotic association. Severe contamination may occur with finite or no manifestation or may include indications such as jaundice (yellowing of eyes and skin), dark urine, extreme fatigue etc[5]which use the liver as their primary site of replication. Each of these, known as hepatitis A through E viruses (HAV to HEV. In some cases, the immune system mistakes the liver as a harmful object and begins to attack it. It causes ongoing inflammation that can range from mild to severe, often hindering liver function. It's three times more common in women than in men. For some people, hepatitis B is an acute, or short-term, illness but for others, it can become a long-term, chronic infection. Risk for chronic infection is related to age at infection: approximately 90% of infected infants become chronically infected, compared with 2%–6% of adults. Chronic hepatitis B can lead to serious health issues, like cirrhosis or liver cancer. The best way to prevent hepatitis B is by getting vaccinated while hepatitis C is a short-term illness but for 70%–85% of people who become infected with Hepatitis C, it becomes a long-term, chronic infection. Chronic Hepatitis C is a serious disease than can result in long-term health problems, even death. The majority of infected persons might not be aware of their infection because they are not clinically ill. There is no vaccine for Hepatitis C. The best way to prevent Hepatitis C is by avoiding behaviors that can spread the disease, especially injecting drugs.

Materials and Methods

Study Cases and Sample collections

Two types of Hepatitis patients were enrolled in the study: Hepatitis B (10 patients) and Hepatitis C (10 patients) who treated with silymarin drug in addition to untreated patients(10 patients) and healthy humans [10]. They were referred to the gastroenterology and hematology teaching hospitals,Baghda, Iraq during the period from September to December 2018 for diagnosis and treatment. The diagnosis was based on a clinical examination and laboratory evaluations, which were carried out by the consultant medical staff at the hospital. The patients were Iraqi Arabs, and their age ranged between 25-40 years.

Blood Sampling

An overnight fasting venous blood samples were obtained from all tweenty patients (Hepatitis B and C) with healthy persons (10 persons) and un treated patients (10 persons). serum alanine aminotransferase, and serum aspartate aminotransferase, serum alkaline phosphatase, serum total bilirubin, serum urea, serum creatinin were measured using autoanalyser device (Automated Mindray Ps200).

Table (1): reference levels for biochemical tests used in this study

Biochemical Test	Normal Levels
SerumTotal Bilirubin	0-1.4mg/Dl
Urea	20-45 mg/dL
Creatinin	0.6-0.9 mg/dL
Serum ALP 7-9years (male) 7-9years (female) 10-12years (male) 10-12years (female)	 86-315 U/L 69-325 U/L 42-362 U/L 51-332 U/L
SGPT (serum ALT)	0-50 U/L
SGOT (serum AST)	0-60 U/L

ALP: alkaline phosphatase; SGPT: serum glutamic transaminase test; ALT: alanine aminotransferase; SGOT: serum glutamic oxaloacetic transaminase test; AST: aspartate aminotransferase; mg/dL: milligram per deciliter; gm/dL:gram per deciliter; U/L: unit per liter; IU/L: international unit per liter.

Ethical Consideration: Informed consent was obtained from the patients with their agreement.

Statistical Analysis

One mode examination of variance ANOVA (Duncan) was made to test whether group alteration was important or not, statistical significance was defined as $p \leq 0.05$. Data were expressed as mean± standard error and statistical significances were carried out using Graph Pad Prism version 6 (Graph Pad Software Inc., La Jolla)

Results and Discussion

Table 2 declared that treated patient with silymarin drug had significantly lower concentrations of serum ALP, GPT and GOT to (137.52±5.71, 196.70±9.10 and 76.63±4.30)(Unit/L) in compaired to hepatitis patients(350.19±2.15, 210.33±29.43 and 178.12±23.50) (U\L) respectively. The results of blood urea, creatinin and total bilurbin matches the results of liver enzymes in which the drug possess the ability to decrease the level of test indicated above to (42.50±3.37, 1.13±0.06 and 2.81±0.68) (mg\dL) in compared to hepatitis patiens (66.01±1.7, 2.28±0.20and 5.16±0.28) (mg\dL) for blood urea, creatinin and total bilurbin respectively (Table 2).

Table (2): Effect of Silymarin on liver function enzyme and kidney function test for hepatitis B patients

Biochemical Test		No. of cases	Healthy humans (Control negative) (mean ±S.E.)	Hepatitis B patients (Positive control) (mean ±S.E)	Patient Treated with silymarin Drug (mean ±S.E.)
ALKALINE PHOSPHATASE- ALP	U\L	10	76.23±25.01	350.19±2.15	137.52±5.71
ALT-SGPT		10	32. ±2.9	210.33±29.43	196.70±9.10
AST-SGOT		10	26 ±2.659	178.12±23.50	76.63±4.30
BLOOD UREA	mg\Dl	10	28.1±3.8	66.01±1.7	42.50±3.37
CREATININE		10	0.85±0.1	2.28±0.20	1.13±0.06
TOTAL BILIRUBIN –TBI		10	0.4±0.09	5.160±0.28	2.81±0.68

Hepatitis C showed a significant increased in all liver enzymes level compared to treated humans (347.41±2.15 *vs*. 207.25±11.94, 256.07±29.43 *vs*. 137.61±2.186 and 167.6±4 *vs*. 95.2±4.7Unit/L) or healthy humans(64.89±25.01, 39.43±12.10 and 35.56±12.59) U\L for ALP, GPT and GOT respectively.

the other investigated biochemical test agreed with the previous results in which the level of treated humans decrease after treatment with silymarin in compaired to elevated level for hepatitis patients(42.01±3.72 *vs*. 66.01±1.70, 1.33±0.13 *vs*. 2.280±0.2 and 1.60±0.11 *vs*. 4.16±0.28) mg\dL for for blood urea, creatinin and total bilurbin respectively.

Table 3: Effect of silymarin on liver function enzyme and kidney function test for hepatitis C patients

Biochemical Test		No. of cases	Healthy humans (Control negative) (mean ±S.E.)	Hepatitis C patient (Positive control) (mean ±S.E)	Treated patient with silymarin (mean ±S.E.)
ALKALINE PHOSPHATASE-ALP	U\L	10	64.89±25.01	347.4±2.159	207.2±11.94
ALT-SGPT		10	39.43±12.10	256±29.43	137.61±2.186
AST-SGOT		10	35.56±12.59	167.6±4	95.2±4.7
BLOOD UREA	mg\dL	10	32.5±3.37	66.01±1.70	42.01±3.72
CREATININE		10	0.85±0.1	2.28±0.2	1.33±0.13
TOTAL BILIRUBIN –TBI		10	1.19±0.68	4.16±0.28	1.60±0.11

This study was based on people with viral hepatitis B and C and all tests were done for them include ALT-SGPT, AST-SGOT, ALKALINE PHOSPHATASE-ALP, Blood urea, Creatinine and Total bilirubin –TBI . The results were calculated on healthy peoples, a certain number of patients hepatitis B and C and people treated with silymarin drug.

Liver has a pivotal role in regulation of physiological processes. It is involved in several vital functions such as metabolism, secretion and storage. Furthermore, detoxification of a variety of drugs and xenobiotics occurs in liver[6]. Most of the hepatotoxic chemicals damage liver cells mainly by inducing lipid peroxidation and other oxidative damages, but medicinal plants or their products may counteract such damages [7]. Silibinin (INN), also known as silymarin (both from *Silybum*, the generic name of the plant from which it is extracted), is the major active constituent of, a standardized extract of the milk thistle seeds, containing a mixture of flavonolignans consisting of silibinin, isosilibinin, silicristin, silidianin, and others and considered as a supportive element in treatment of alcoholic and child grade 'A' liver cirrhosis [8]. Oxidative stress is considered to play a prominent causative role in many diseases, including liver damage [9]. Silymarin, like other flavonoids, has been shown to inhibit P-glycoprotein-mediated cellular efflux[10]. The modulation of P-glycoprotein activity may result in altered absorption and bioavailability of drugs that are P-glycoprotein substrates. It has been reported that silymarin inhibits cytochrome P450 enzymes and an interaction with drugs primarily cleared by P450s cannot be excluded and by inhibiting HCV entry and fusion[11], promoting HCV-induced oxidative stress, precluding HCV transmission, and blocking viral production [12].

The impact of treatment with silymarin on patients with viral hepatitis in different studies is difficult to compare because of the disparity in treatment populations and treatment regimens. However, as a general trend there is improvement in the transaminases with treatment compared with baseline, but only equivocal effects on other liver enzymes It was found that the effect of silymarin on patients with viral hepatitis C type had a positive effect and a decrease in the proportion in the analysis, ALT-SGPT, AST-SGOT, Blood urea, Creatinine and Total bilirubin –TBI[13].The effect of the drug on people with viral hepatitis B has a strong and obvious effect through the results in the test table(14).

The result agree with who state that silymarin was found to decrease ALT and AST in patient with hepatitis caused by viral infection throught multiple mechanisms including the accumulation of genetic damage due to immune-mediated hepatic inflammation and the induction of oxidative stress and there direct effects of the viral proteins HBx and HBs on the cell biology[15]. Integration of HBV-DNA into the human genome is considered an early event in the carcinogenic process and can induce, through insertional mutagenesis, the alteration of gene expression and chromosomal instability[16].

Conclusion

Hepatoprotective effects of the silymarin from plant source was overwhelmed by their potentials in reducing the hepatic and kidney damage caused by viral infection which had the ability to elevate level of liver function enzyme and kidney function test**.**

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict Of Interest: The authors declare that they have no conflict of interest.

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