Volume 13 Issue 1
Originally issued as F2

Global Journal of Medical research
Diseases
Volume 13 Issue 2 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN : 0975-5888

Study Several Biochemical Parameters into Patient's with Hepatitis B Virus

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Material and Methods: Thirty six patients with HBV positive group, Thirty six patients with HBV negative and compared to thirty control group were included in this study. Glutathione, superoxide dismutase (SOD) activities, malondialdehyde (MDA), Vit C, Vit E and albumin levels were measured in all patients and control group specthrophotometrically.

Results: SOD activity, GSH, VitC, Vit E and albumin were significantly lower in patients with HBV positive group when compared to patients with HBV negative and control group. However, MDA levels was increased in each patient group as compared to the control group.

Conclusion: The current study supposed that deficiency of antioxidant barrier may cause oxidative stress in patients with HBV, and may be antioxidant treatment should be useful for these patients.

Keywords : *HBV, antioxidant enzymes, malondialdehyde, vit c and vit e.*

GJMR-F Classification : *QU 34, QW 170*



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I. Introduction

Hepatitis B is inflammation of the liver, which can be caused by viruses, medications, or toxic agents, the infection is usually characterized by the presence of hepatitis B surface antigen [1]. Other markers are used to determine if the virus is active and replicating when it can cause serious liver damage. During the course of HBV, clearance of hepatitis B early antigen (HBeAg) represents a key event; because it implies that the host is no longer immuno tolerant and enters a low replication phase [2] .Age at onset of infection is an important factor affecting the outcome HBV infection. A major world health problem is hyper endemic in South-East Asia and sub-Saharan Africa, being a major cause of morbidity and mortality [3].

Antioxidants are a molecule which can safety interact with free radicals and terminate the chain reaction before vital molecules are damaged. Oxidative damage has been reported to be involved in several Hepatic diseases [4].

Antioxidant systems neutralizing the harmful effects of the endogenous Reactive Oxygen Species (ROS) products [5]. Under certain conditions, the oxidative or anti-oxidative balance shifts towards the oxidative status as a result of increase in ROS and/or impairment in antioxidant mechanism [6,7].

Superoxide dismutase can be also considered a member of antioxidants mechanisms of cell since it catalyze transformation of highly reactive superoxide anion to the less potent hydrogen peroxide. It plays an important role in protection of cells against oxygen toxicity [8].

Glutathione is involved important cell function including vitamin C metabolism, chelating of copper ions and biotransformation of foreign substances and intermediate oxygen metabolites GSH is synthesized mainly in liver, it is the main of intracellular defense against free radical and electrophilic xenobiotic of hepatocytes [9].

Vitamin E is generally accepted to be lipid-soluble antioxidant in human .the water soluble antioxidant; this vitamin is not synthesized in human. It is also exhibit a number of important physiological activities that are not related to its antioxidants properties, its function are an electron donor for different enzymes in the cells, vitamin E was reported to protected hepatocytes against toxic injury [4].Many studies recoded elevation in the levels of ALT and AST in HBV patients as a result of body's immune response and damage of hepatocytes due to the infection [10].

The aim of the present study is to determine the role of oxidative stress on hepatic damage in patients with hepatitis B virus HBV infection and correlation the MDA, GSH, SOD, Vitamin C, E albumin and uric acid levels with liver function in sera of patients with HBV infection.

II. Materialand Methods

The sampling procedure was done in 36 patients (29.53±6.81 years) with HBV positive and 34patients (31.33±5.52) years with HBV negative. None of these patients received antioxidant medicines or foods. Patients were chosen from the patients referred to the Medical City in Iraq. Patients were compared with 30 healthy control subjects were included (mean age 32.5±5.00). All patients were subjected to a detailed

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history taking, thorough clinical examination, and laboratory investigations including liver function test, , in addition to lipid peroxidation (the level of lipid peroxidation expressed as malondialdehyde(MDA)), uric acid, Glutathione , vitamin E, vitamin C ,superoxide dismutase [SOD]and albumin had been measured in patients with hepatitis B-virus . Blood samples were obtained from the patients and control group, Five ml were collected from each subject by vein puncture, centrifuged at 3000 rpm for5 min after allowing the blood to clot at room temperature. The serum GPT, GOT, total serumbilirubin, direct serumbilirubin, Uric acid and Albumin levels were measured by spectrophotometeric methods supplied by Giesse Diagnostic. Plasma malondialdehyde [MDA] was determined according to the modified method of Satoh [11]. Glutathione was estimated by the method of Beutler's method [12]. Superoxide dismutase was determined according to the method of Misra HP and Fridovich I [13]. Ascorbic acid levels were estimated by the method of Tietz [14]. Vitamin Elevels were determined according to a modified of Hashim and Schuttringer [15].

All statistical analyses in studies were performed using SPSS version 17.0 for Windows (Statistical Package for Social Science, Inc., Chicago, IL, USA). Descriptive analysis was used to show the mean and standard deviation of variables. The significance of difference between mean values was estimated by Student-Test. The probability $P < 0.05$ = significant, $P > 0.05$ = non-significant. Correlation analysis was used to test the linear relationship between parameters. ANOVA test was used to show the differences between variables of differentiated groups.

III. Results and Discussion

The mean and standard deviation of GPT,GOT,TSB(total, direct and indirect bilirubin) were showed significant increased in their concentration in patients with HBV positive when compared with patient with negative HBV and also with control , as shown in Table 1.

Table 1 : The mean and standard deviation of GPT, GOT, TSB(total, direct and indirect bilirubin) in patients groups [Patients with HBV positive group, Patients with HBV negative group]and control group

Characteristic	Patient with HBV positive [n=36]	Patients with HBV negative [n=36]	Control [n=30]
GPT[Iu/ml]	48.80±9.31 [a,b]	32.30±3.91 [a]	8.3±0.41
GOT[Iu/ml]	50.33±8.89 [a,b]	30.80±4.59 [a]	8.10±2.50
TSB [mg/dl]	2.55±0.25[a,b]	1.50±0.16[a]	0.75±0.11
Direct S.B [mg/dl]	1.52±0.90 [a,b]	0.81±0.07[c]	0.29±0.01
Indirect S.B[mg/dl]	1.08±0.08 [a,b]	0.73±0.06 [c]	0.48±0.03

a $p < 0.001$ compared to control group
b $p < 0.001$ compared to patients with HBV negative group
c $p < 0.01$ compared to control group

Table 2 showed mean and standard deviation of serum, MDA, GSH, SOD, vitamin E, vitamin C, Albumin and uric acid, showed significant difference between patients groups [Patients with HBV positive group, Patients with HBV negative group] and control Group. Serum SOD activity, GSH, vitamin E, vitamin C, Albumin and uric acid were significantly decreased in Patients with HBV positive group when compared with Patients with HBV negative group and control group as shown in Table 2.

Table 2 : Comparison of Different Parameters Related to Oxidative Stress and Antioxidant Defenses Systems) in patients groups [Patients with HBV positive group, Patients with HBV negative group]and control group

Characteristic	Patients with HBV positive [n=36]	Patients with HBV negative [n=36]	Control [n=30]
MDA	6.25±1.32 [a,b]	5.58±1.02 [c]	1.98±1.51
GSH	496±121 [a,b]	590±115 [c]	620±105
SOD	1.10±0.29 [a,b]	1.29±0.26 [c]	1.54±0.41
Vit E	0.88±0.25 [a,d]	1.02±0.23[c]	1.37±0.14
Vit C	0.98±0.30 [a,d]	1.20±0.23 [c]	1.68±0.39
Alb	2.79±0.14 [a,b]	3.71±0.18 [c]	4.31±0.26
Uric acid	5.11±0.13 [e,f]	5.13±0.16	5.30±0.18

a $p < 0.001$ compared to control group
b $p < 0.01$ compared to group2
c $p < 0.01$ compared to control
d $p < 0.05$ compared to group2
e $p < 0.05$ compared to control
f $p < 0.05$ compared to group2

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There were a different correlations between GOT, GPT, TSB and other parameters in patients with HBV positive as shown in table 3.

Table 3 : Correlation between GPT ,GOT and TSB with several antioxidants in patients with HBV positive

Characteristic	GOT		GPT		TSB	
	r	p	r	p	r	p
MDA	0.81	0.01	0.77	0.01	0.69	0.01
GSH	-0.75	0.01	-0.80	0.01	-0.75	0.01
SOD	-0.75	0.01	-0.69	0.01	-0.78	0.01
Vit E	-0.68	0.01	-0.71	0.01	-0.68	0.01
Wit C	-0.72	0.01	-0.77	0.01	-0.75	0.01
Alb	-0.69	0.01	-0.70	0.01	-0.66	0.01
Uric Acid	-0.08	N.S	0.04	N.S	0.06	N.S
Age	0.89	N.S	0.05	N.S	0.04	N.S

Antioxidants play an central role in shielding the body from an oxidative insult by superoxide anion radicals peroxides and hydroxyl radicals and. The sensitive balance between the pro- and anti-oxidant forces in the body appears to be very crucial in determining the state of health, wellbeing and longevity [16].Hepatitis B is one of the diseases that might cause oxidative stress in the affected subject leading to reduction of the antioxidants of the body, SOD in hepatic diseases may be cause free radical formation [17]. Reduction of antioxidant defense of the liver contribute to the role of oxygen radical formation promote the pathological process in the liver [18].Several of the ROS which have helpful physiological functions are produced incessantly in the individual organism, other than they may be intimidating for normal cell function and reliability when produced in excess. Consequently, aerobic organisms developed protection mechanisms, such as and SOD against the harmful effects of ROS. Several studies have produced confirmation that a good correlation exists between type and severity of disease and antioxidant level in blood, such as cardiovascular diseases, neurological diseases [19].Over 90% of GSH inflow in systemic circulation is accounted for by the influx of this peptide from the liver [20].

Reduced bloodGSH levels have been reported for patients with liver disease of both alcoholic and non-alcoholicetiology [20, 21].The current study is in agreement with the above results. The primary cause accounting for the decreased blood GSH level in patients with liver diseases is a decreased production in and decreased inflow from the liver [20].

The results in the present study showed that there were statistically significant lower levels of serum SOD, GSH, Vit E, Vit C and albumin among patients with HBV positive group than those of control cases. Since a significant negative correlation between serum GOT,GPT and TSB with SOD,GSH ,Vit E, Vit C among the patients, the current study suggest that the association of plasma SOD , Vit E, Vit C and albwith GPT and GOT may improve the biochemical assessment of liver damage.

Detection of the increase of MDA levels which is a product of lipid peroxidation in all patient groups indicates that the oxidative stress is increased in HBV infection. Several study reported elevated MDA levels in patients with chronic hepatitis B and C [22, 23].These findings agree with our findings of a significant elevation of MDA levels in HBV infected patients. Moreover, The result showed a significant positive correlation between serum MDA with GOT, GPT and total bilirubin. One hypothesis has been showed that hydroxyl radicals may react by either hydroxylation or hydrogen abstraction, setting off free-radical chain reactions that subsequently increases MDA concentration[24].In summary, the present results agree with other studies that have shown increased MDA level and changes in activities of GSH[*25*]. These findings indicate that the glutathione antioxidant system is imbalanced in hepatocellular damage, and they support the hypothesis that oxidative stress plays an important role in the development of these liver diseases.

In conclusion, serum MDA, GSH and SOD measurements are useful in monitoringhepatocellular damage in patients with HBV positive .also the present study considered that deficiency of antioxidant barrier may cause oxidative stress in patients with HBV and, so antioxidant treatment should be useful for these patients.

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