



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1301124>Available online at: <http://www.iajps.com>

Research Article

**ANALYSIS OF ROLE OF ANTIOXIDANTS IN DIABETIC HCV  
PATIENTS IN PAKISTAN**Dr Arva Zubair Khan<sup>1</sup>, Sana Urooj<sup>2</sup>, Dr Mudassar Hussain<sup>3</sup><sup>1</sup>Nishtar Hospital Multan<sup>2</sup>WMO at BHU Aghapur, Bahawalpur, Pakistan**Abstract:**

**Introduction:** Hepatitis C virus (HCV) is one of the main causative agents of chronic viral hepatitis. Chronic hepatitis C can progress to cirrhosis and eventually to hepatocellular carcinoma over a period of 20 to 30 years. **Objectives of the study:** The main objective of the study is to find the role of antioxidants in diabetic HCV patients in Pakistan. **Material and methods:** This study was done at DHQ teaching hospital Gujranwala, Pakistan during Oct 2017 to Dec 2017. This study was conducted according to the rules and regulations of authority. For this research purpose we selected 50 individuals of both genders. This study was carried out on 50 patients who were categorized into three groups i.e., control, HCV patients and HCV/diabetes patients. The blood was collected from a cuboital vein of patients and serum was separated within one hour by centrifugation. **Results:** Our results show that antioxidants are the important biomarkers for the diagnosis of liver problems in diabetic patients. The level of SOD, CAT, GSH and MDA were decreases in diabetic HCV patients as compared to normal and simple HCV patients. The important biomarker is MDA and SOD. **Conclusion:** It is concluded that antioxidants levels have been related to various disease processes and play a significant role in the pathogenesis of diabetic complications. Their plasma levels are usually used as a marker of lipid peroxidation. Plasma MDA, SOD, GSH and CAT was elevated in chronic hepatitis C and liver cirrhosis patients.

**Key words:** Hepatitis, Diabetes, HCV, Antioxidants**Corresponding author:****Dr. Arva Zubair Khan,**  
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Please cite this article in press Arva Zubair Khan et al., *Analysis of Role of Antioxidants in Diabetic HCV Patients in Pakistan*, *Indo Am. J. P. Sci*, 2018; 05(06).

**INTRODUCTION:**

Hepatitis C virus (HCV) is one of the main causative agents of chronic viral hepatitis. Chronic hepatitis C can progress to cirrhosis and eventually to hepatocellular carcinoma over a period of 20 to 30 years. The mechanisms by which HCV causes cell damage are not well understood. Different mechanisms including immunological liver damage, direct cytotoxicity mediated by different viral product and inductions of oxidative stress have been suggested as playing a pathogenic role in this infection [1]. It has been suggested that HCV may cause oxidative stress in infected cell. Several lines of evidence support this contention, including the existence of activated glutathione turnover, the presence of increased levels of lipid peroxidation products and augmented iron stores in the liver, and the finding of diminished reduced glutathione values in peripheral blood mononuclear cells and erythrocytes [2].

Tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) is an important component in the inflammatory process. In HCV infection, increase in TNF- $\alpha$  level and changes in insulin signalling pathways could result in insulin resistance. A combined therapy of interferon- $\alpha$  along with ribavirin has widely been used as a standard treatment option for those patients who have chronic hepatitis C virus infection all over the world [3]. Consequently, antioxidant therapy to lower oxidative stress is being investigated to treat the HCV infection and its related consequences.

Lipid peroxidation is a free radical activity, plays a significant role in the development of complications in diabetes [4]. It has been observed that HCV patients have enhanced oxidative stress indicated by increased free radical production [5]. MDA is one of the products of lipid peroxidation and was commonly used to determine the oxidant or antioxidant balance

in the patients of diabetes mellitus as it is stable and easily assessable [6].

**Objectives of the study**

The main objective of the study is to find the role of antioxidants in diabetic HCV patients in Pakistan.

**MATERIAL AND METHODS:**

This study was done at DHQ teaching hospital Gujranwala, Pakistan during Oct 2017 to Dec 2017. This study was conducted according to the rules and regulations of authority. For this research purpose we selected 50 individuals of both genders. This study was carried out on 50 patients who were categorized into three groups i.e., control, HCV patients and HCV/diabetes patients. The blood was collected from a cuboital vein of patients and serum was separated within one hour by centrifugation.

**Biochemical analysis**

The serum samples were evaluated for antioxidants content and alanine aminotransferase (ALAT) activity to assess the liver damage and lipid peroxidation by the method of Ohkawa et al. (1979). The ALAT was measured by commercially available kit.

**Statistical Analysis**

Statistical analysis (Anova Test and Post Hoc) was performed using the SPSS software program (17.0). All results were expressed as the mean  $\pm$  standard deviation (SD). As P value  $<0.05$  was considered to be statistically significant.

**RESULTS:**

Our results shows that antioxidants are the important biomarkers for the diagnosis of liver problems in diabetic patients. The level of SOD, CAT, GSH and MDA were decreases in diabetic HCV patients as compared to normal and simple HCV patients. The important biomarker is MDA and SOD.

**Table 01:** Analysis of level of antioxidants in all groups.

No.of Observation	Analysis of blood	Normal $\mu\text{g/mL}$	HCV $\mu\text{g/mL}$	HCV/Diabetes) $\mu\text{g/mL}$
01	SOD	0.32 $\pm$ 0.00	0.33 $\pm$ 0.23	0.39 $\pm$ 0.00
02	CAT	4.16 $\pm$ 0.00	0.90 $\pm$ 0.00	0.43 $\pm$ 0.39
03	GSH	1.89 $\pm$ 0.00	2.48 $\pm$ 1.29	3.23 $\pm$ 0.03
04	MDA	2.35 $\pm$ 0.00	4.26 $\pm$ 0.00	4.95 $\pm$ 0.97
05	ALAT (IU/L)	31.99 $\pm$ 4.06	63.82 $\pm$ 1.45*	108 $\pm$ 1.66*

**DISCUSSION:**

Oxidative stress develops when the disturbances between reactive oxygen forms are produced in excess and the factors preventing their harmful effect occur. Enzymatic antioxidant defense of the organism includes: SOD, CAT, and GSH-Px [7]. Superoxide dismutase protects a cell from toxic effect of superoxide radicals as it catalyzes the dismutation reaction of the radicals [8]. Glutathione peroxidase decomposes hydrogen peroxide but it also converts lipid peroxides to harmless molecules protecting the cells from the consequences of lipid peroxidation. GSH-Px removes H<sub>2</sub>O<sub>2</sub> by the oxidation of reduced glutathione. Oxidized glutathione (GSSG) is produced and it is reduced again by glutathione reductase, and the NADPH (produced in pentose cycle) [9].

The patients of chronic hepatitis C had increased MDA concentrations, and enhanced superoxide dismutase activity by peripheral blood mononuclear cells. The virus also infects the peripheral lymphocytes in the viral hepatitis. Interferon stimulated healthy cells against viruses and it is produced by infected lymphocytes. Lipid peroxidation, a free radical-induced mechanism is associated in the pathogenesis of numerous acute and chronic human disorders, involving liver pathology [10]. An inability in the oxidative capacity of the cells or any exposure to more oxidant stress can lead to acceleration of peroxidation reactions of certain cellular molecules including lipids in the cellular membrane system [11].

Oxidative stress has been detected in almost all clinical and experimental conditions of the chronic liver diseases. There are many studies about the oxidant stress in chronic hepatitis C patients [12].

**Conclusion**

It is concluded that antioxidants levels have been related to various disease processes and play a significant role in the pathogenesis of diabetic complications. Their plasma levels are usually used as a marker of lipid peroxidation. Plasma MDA, SOD, GSH and CAT was elevated in chronic hepatitis C and liver cirrhosis patients.

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