INTERFERON-INDUCED THYROID DISORDER IN HEPATITIS C PATIENTS

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ABSTRACT

Background: Chronic hepatitis C infection and liver cirrhosis is a long-term disease that occurs when the virus remains in a person's body. **Objective:** To assess the frequency of the thyroid disorders in HCV patients induced by interferon. **Methodology:** Study Design: Comparative cross sectional study. Fourty five individuals were taken suffering from Hepatitis C taking interferon along with 30 comparable healthy persons included in the study at School of Biochemistry, Minhaj University Lahore and Jinnah Hospital Lahore. Study Duration: 1st March to 31st August 2017. 5 ml venous blood was drawn and undergone the process of centrifugation at 3000-4000 rpm for 15-20 minutes for the serum segregation. Age, serum FT4, serum AST, serum ALT, serum ALP, TP and TB and MDA level was estimated. Data was analyzed by using SPSS version 20. **Results:** Age was remarkably more in patients (41±12 years) as compared to healthy subjects (31±5 years) and significant statistically (p=0.003). Serum FT4 level in patients was (18.5 ± 6.2 years) and normal persons (14.5 ± 2.4) significant statistically. (p=0.04). AST level in diseased persons was (48±22) while in healthy individuals was (32±8) also significant statistically. (p=0.001). Malondialdehyde (MDA) in HCV patients elevated (11±2.1) as compared to healthy subjects (3.2 ± 1.2) and also showed that it was statistically significant (p=0.000). **Conclusion:** Present study concluded that strong relationship exist between HCV, Thyroid disorder and Oxidative stress. Due to the increased lipid peroxidation, MDA level was increased while the total protein (TP) level in the serum decreased. High lipid peroxidation and increased serum AST level were involved in the progression of disease.

Key Words: AST, ALT, MDA, Interferon, Thyroid disease, FT4

INTRODUCTION

The human body is susceptible of accomplish distinct work that is an authentic constitute tool, the potency of body to perform task is owing to special configuration not only but also internal and external body that act jointly in standardize manner.[1,2] In human body organs alter suitably to their bulk, performance and exploitations.[3] Millions of cells accumulation form an organ that combine unitedly to execute single performance in body. According to volume and weight liver is second biggest organ in human body.[4] A reddish brown with four parts and shape liver is essential organ of body.[5,6] Liver sustain nearly each organ in body and essential for endurance. A multidimensional performance and strategical position, liver include many disorder. Drug impairment, tumor, scarring of liver, alcohol impairment, fatty acid accumulation in liver and hepatitis are ordinary contagion of liver.[1]

There are two types of hepatitis one of the other "acute" or "chronic". After detection of hepatitis C virus acute hepatitis contamination is less duration sickness occur within 6 months. In an individual body if hepatitis C virus be left behind then it will be long term duration that leads to chronic hepatitis C contamination.[5] Genus Hepacivirus of the Flaviviridae family arrange HCV that is small engulfed positive strand RNA virus.[6] Serious liver disease containing scarring of liver occur due to HCV infection, the pathway of HCV pathogenesis left unknown. Several pathological states contain HCV-occurred pathogenesis of liver occurred due to oxidative stress, which play main role in its evolution and advancement. Elevation in the parameters of oxidative stress designate HCV infection.[7] Oxidative stress occur when there is instability between prolongation of free radicals and efficiency to quickly damage the reactive interposed or easily retrieve the consequent harm.[8] Hepatitis C sick person have elevated oxidative degradation of lipids yield in serum and liver sample. Unsaturated fatty acids, phospholipids, glycolipids, cholesterol ester and cholesterol produce hydro peroxides which are non-radical interposed. Their synthesis appear in enzymatic and non-enzymatic way including efficient chemical kinds called ROS (reactive oxygen species) that are liable poisonous results in body through several harm of tissues.[9] Number of distinguishing test including quantitative HCV RNA PCR, ELISA (HCV antibody enzyme linked immunoassay) and recombinant immuno blots assay are performed for detection of hepatitis C. After contamination of two weeks HCV RNA can be find by PCR distinctively.[10] In hepatitis C Interferon drug merely factor that give effective management. Immune system cells form and released Interferon (IFNs) which is a family of naturally appearing protein for instance white blood cells, natural killer

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cells, epithelial cells and fibroblast. Glycoproteins called as cytokines class include IFNs.[11] Within host cells, interferons are called after their capability to "Interfere" or interpose with viral copy process.[11,12]

For chronic Hepatitis C (HCV) Interferon alpha (IFN alpha) is curative factor when given to sick or effected person but thyroid also affected straightly by using this drug. Autoimmune derangement are related with conjunction curation and contain thyroid abnormality, skin abnormality and diabetes mellitus. Thyroid abnormality and thyroid antibodies related with management are most normal autoimmune disorders.[13] For each cell in body thyroid hormone is important for performance. In the human body they help in dispose expansions and estimate of metabolism.[14] This study was conducted to assess the frequency of the thyroid disorders in HCV patients induced by interferon.

METHODOLOGY

Study Design: Cross sectional study. Study Subjects: Fourty five randomly selected individuals suffering from Hepatitis C, taking interferon were included in the study at Biochemistry Lab, School of Biochemistry, Minhaj University Lahore after the approval of ethical and Research committee. Exhaustive history, clinical problems if any, addicted unusual smoking, tobacco masticating was taken from individuals through a form. Clinical findings of the patient was also being taken into deliberation. Thirty (30) sex method persons were incorporated as controls.

Method of Data Collection

Blood samples were collected from Jinnah Hospital and Mayo Hospital Lahore with hygienic precaution. Up-to-date consent from patients was acquired before assembly of blood samples. Ethical approval was sought from hospital ethical committee. Study duration: 1st March to 31st August 2017. Five ml blood was collected in Gel clotted vials and centrifuged for serum separation. All chemical reagents were belongs to analytical grades and purchased from Sigma Chemical Co. (St. Louis, Mo, USA).

Determination of AST, ft4, ALT and ALP was done by following principle using commercially available Bio Merux and Randox kits. Total protein and total bilirubin levels of serum was determined by Jendrassik and Groff method. Thiobarbituric acid reactive substances (TBARS) measured by Ohkawa et al., 1979.[15]

RESULTS

The results are shown in table I in patients of HCV undergoing interferon therapy and normal subjects. The age was high remarkably in patients (41±8 years) as compared to healthy ones (31±5 years) also significant statistically (0.003).

Table I: Comparison between different Biomarkers in HCV Patients receiving interferon and Healthy Subjects.

Parameters	Patients (n =45) Mean ± S.D	Control (n = 30) Mean ± S.D	P Value
Age	41.84±12.43	31.02±5.53	0.003
FT4	18.56±6.22	14.55±2.47	0.046
ALT	42.66±6.19	29.66±18.22	0.216
AST	48.51±22.12	32.23±8.11	0.001
ALP	26.12±16.19	22.17±11.01	0.167
Total Bilirubin (TB)	2.17±0.61	0.91±0.17	0.371
Total Protein (TP)	3.17±0.77	7.19±1.41	0.000
Malondialdehyde (MDA)	11.76±2.11	3.21±1.27	0.000

When free thyroid (FT4) level was measured, it was noticed that patients of hepatitis C (HCV) have high level of FT4 (18.5 ± 6.2) and normal persons have (14.5 ± 2.4). (p=0.04). ALT level was observed in patients (42.6 ±6) while in normal individuals (29.6 ± 18) and statistically non-significant (p=0.216). Data shows that AST level was high in diseased persons (48.5 ± 22) from healthy persons (32.2 ±8) also significant statistically (p=0.001). ALP level was also elevated in HCV patients (26.1±16) from normal subjects (22.1±11) while statistically non-significant (p=0.167). Serum level of Total bilirubin (TB) in HCV patients was (2.1± 0.6) while in normal persons (0.91±0.1) which show that TB level increased in patients while non-significant (p=0.371). Serum total proteins (TP) level decreased in HCV infected persons (3.17±0.7) from normal subjects (7.19±1.4) and significant statistically (p=0.000). Lipid peroxidation level in terms of Malondialdehyde (MDA) in HCV patients elevated remarkably (11.76±2) as compared to Healthy subjects (3.21±1.2) and also shows that it is significant statistically (p=0.000).

DISCUSSION

Globally, hepatitis C is common chronic viral infections of liver and has healthcare and implications.[12-14] The worldwide burden of chronic hepatitis C infection is enormous and increasing.[15] INF alpha-2b and ribavirin therapy is related to

development of autoimmune thyroid disease.[16] Previous studies have reported an incidence between 4.3–31.23%.[15-17] Moreover, 7.4 % of patients had hypothyroidism and 7.37% of patients had hyperthyroidism while 2.9% had biphasic thyroiditis. Hypothyroidism was common in the study as is this case in most of the other studies.[15-17]

Oxidative stress occurs when reactive oxygen and nitrogen species generated from oxidative metabolism or from pro-oxidant environmental exposures are not balanced by antioxidant mechanisms.[14,15] These mechanisms perform a keyrole as antioxidant system to decrease the damage in the cells due to the reactive oxygen species (ROS).[12,13] Enzymatic and non-enzymatic antioxidants are present in intracellular and extracellular space. Oxidative stress is a key role in the enlargement and the development of HCV-induced pathogenesis of liver. Our study showed an increased oxidative stress during hepatitis infections. Hepatitis C virus (HCV) infection is characterized by the increased biomarkers of oxidative stress.[16]

In the skeletal muscle cells, same of it SOD is present in the mitochondria of the muscles. HCV would only be ultimately accompanying with hepatocarcinogenesis, if this is the situation. Another possible cause of hepatocarcinogenesis may be the direct involvement of HCV. wherever the product of the virus might be oncogenic and elaborate in cell alteration.

CONCLUSION

Present study showed strong association between HCV treatment with interferon oxidative stress and thyroid disorders. Oxidative stress biomarker, group MDA level is high in treatment. MDA can be used as a useful biomarker to measure the Lipid peroxidation level. Due to the increased lipid peroxidation, MDA level may be increased while the total protein (TP) level in the serum decreased. High lipid peroxidation and increased serum AST level involved in the progression of disease.

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