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ANALYSIS OF BIOCHEMICAL MARKERS IN PATIENTS WITH HEPATITIS RESISTANT TO INTERFERON THERAPY

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Abstract:

Introduction: *Hepatitis is a Latin word which means inflammation of liver. At the present time viral hepatitis is a major health problem worldwide, particularly in Asian countries. Hepatitis is caused by different hepatic viruses and it leads to liver related morbidity.* ***Aims and objectives:*** *The main objective of the study is to analyse the biochemical markers in patients with hepatitis resistant to interferon therapy.* ***Material and methods:*** *This cross sectional study was conducted in Combined Military Hospital, Rawalpindi during September 2018 to February 2019. The data was collected from 100 hepatitis patients of both genders. This study was aimed to analyse the biochemical markers in hepatitis patients. Blood sample was drawn for the analysis of serum biomarkers. Liver function test of all the selected patients was done by using enzymatic kit method. Serum micronutrients levels were also determined for all those patients who were resistant to interferon therapy.* ***Results:*** *The data was collected from 100 hepatitis patients. The mean age was 36.5 + 10.1 years and BMI of the patients was 21.7 ± 2.7 (kg/m^2). The mean duration of HIV was 38 ± 43.8 months. There were non-significant relationship present in diseased group treated with different therapies like interferon and glutathione as as $p<0.05$. The level of micronutrients become decreases in diseased group.* ***Conclusion:*** *It is concluded that most of the patients of co-resistant HBV and HCV have decreased value of micronutrients and increased value of ALT and AST levels.*

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INTRODUCTION:

Hepatitis is a Latin word which means inflammation of liver. At the present time viral hepatitis is a major health problem worldwide, particularly in Asian countries. Hepatitis is caused by different hepatic viruses and it leads to liver related morbidity. Mostly hepatic infection is caused by single hepatic virus but sometime infection with multiple viruses may occur and it leads to different management problems [1]. These different problems include higher incidence of morbidity and mortality. As hepatitis C virus (HCV), hepatitis B virus (HBV) and hepatitis D virus (HDV) are transmitted via similar routes that is through blood or blood products so as a result, dual infection and even triple infection can occur in some patients at the same time [2]. A condition in which all three viruses (Hepatitis B, C and D) occur together in the same patient is called Triple infection.

Viral hepatitis is one of the major health issues these days. HBV is a partially double stranded, enveloped DNA virus that belongs to the Hepadnaviridae family and Orthohepadnavirus genus. Its size ranges from 40 to 42 nm, replicates in the liver and causes hepatic abnormalities. It damages liver through immune mediated mechanisms [3]. HBV is the 9th leading cause of death worldwide. There are about 400 million people worldwide who are HCV carriers. It causes cirrhosis, liver failure and hepatocellular carcinoma (HCC). Annually one million people die due to HBV. It has worldwide distribution and is also well documented in Pakistan [4].

HBV, HCV and HDV viruses are not only biologically different but their life cycles and modes of gene expression are also totally different from each other. Despite of all these differences, they share same routes of transmission. These three viruses (HBV, HCV, and HDV) are the major causes of chronic liver disease [5]. All three viruses (HBV, HCV, and HDV) are transmitted due to direct or indirect exposure to infected blood or body fluids that contain infected blood. Common routes for transmission of these viruses are infected blood transfusion, contaminated syringes, injecting, tattoo and skin piercing with infected instruments, infected household contacts, through infected mother to her baby, by sexual contact with infected person, and via sharing of needles contaminated by infected drug users etc[6].

Aims and objectives

The main objective of the study is to analyse the biochemical markers in patients with hepatitis resistant to interferon therapy.

MATERIAL AND METHODS:

This cross sectional study was conducted in Combined Military Hospital, Rawalpindi during September 2018 to February 2019. The data was collected from 100 hepatitis patients of both genders. This study was aimed to analyse the biochemical markers in hepatitis patients. Blood sample was drawn for the analysis of serum biomarkers. Liver function test of all the selected patients was done by using enzymatic kit method. Serum micronutrients levels were also determined for all those patients who were resistant to interferon therapy.

Statistical analysis

The data was collected and analysed using SPSS version 19.0. All the values were expressed in mean and standard deviation.

RESULTS:

The data was collected from 100 hepatitis patients. The mean age was 36.5 + 10.1 years and BMI of the patients was 21.7 ± 2.7 (kg/m^2). The mean duration of HIV was 38 ± 43.8 months. There were non-significant relationship present in diseased group treated with different therapies like interferon and glutathione as as $p<0.05$. The level of micronutrients become decreases in diseased group.

Table 01: Associations of Clinical Parameters with Abnormal Liver Function Tests

Parameter	Abnormal LFTs	*P* value
Age (years)	36.5 + 10.1	0.54
BMI (kg/m^2)	21.7 ± 2.7	0.88
Duration of HIV infection (months)	38 ± 43.8	0.95
Significant alcohol consumption	24 (50%)	0.15
HBV & HCV Co-infection	19 (39.6%)	0.002
HBsAg positive	11 (22.9%)	0.01
Anti HCV positive	06 (12.5%)	0.27
Combined HBV& HCV	02 (4.1%)	–
NAFLD	1 (2.0%)	–

Table 02: Analysis of micronutrients in diseased group

	F	Sig.	t	df	Sig. (2-tailed)	Std. Error Difference
Zinc	1.668	.208	3.798	25	.001	31.206435
			3.531	15.155	.003	33.564560
Iron	24.927	.000	4.189	25	.000	.321750
			3.336	10.037	.008	.404044
Silinium	1.592	.219	17.193	25	.000	.340691
			16.431	16.498	.000	.356485

DISCUSSION

HIV-positive patients are a population at an increased risk of contracting HBV because the infections both have sexual and percutaneous routes of transmission. Thus, patients who are infected with HIV and who are not immune to HBV should be vaccinated (AII). Furthermore, cases in which the risk of exposure to HBV is determined to be high (eg, contact with an HBV carrier), it is unnecessary to await the results of serological tests before starting a vaccine series (AIII) [7]. Serology should be performed before, or concurrent with, the administration of the first dose of vaccine, and vaccination should continue if the results reveal that the patient is nonimmune (anti-HBs negative) and uninfected with HBV [8]. Damage to the structural integrity of liver is reflected by an increase in the level of serum transaminase because these are cytoplasmic in location and are released into circulation after cellular damage [9]. It is generally accepted that the toxicity of carbon tetrachloride depends on the cleavage of the carbon-chlorine bond to generate a trichloromethyl free radical, and this free radical reacts rapidly with oxygen to form a trichloro methyl peroxy radical, which may contribute to the hepatotoxicity and subsequent increase in hepatic enzymes [10].

HCV is a major cause of chronic liver disease. HCV infection frequently leads to chronic hepatitis with increasing risk of developing liver cirrhosis and HCC. Interferon with or without ribavirin is the only drug with proven efficacy in treating chronic HCV infections. Unfortunately, these therapeutic models maintain the rate of sustained virologic response (SVR) to approximately 10-40%. The effective advancement in the antiviral treatments against chronic hepatitis C is necessary [11].

Essential micronutrients are involved in many metabolic pathways in the liver, such as enzymatic functions and protein synthesis, oxidative damage and anti-oxidant defense, immunological competence, interferon therapy response regulations, and alterations of the virus genomes. Reactive oxygen species (ROS) have also been implicated in a number of hepatic pathologies in exacerbating liver diseases. The oxidant production associated with immune reactions against viral hepatitis leads to the formation of hepatocellular carcinoma. Therefore, the changes in micronutrients and their demolishing effects against oxidative stress are factors for viral hepatitis pathogenesis [12].

CONCLUSION:

It is concluded that most of the patients of co-resistant HBV and HCV have decreased value of micronutrients and increased value of ALT and AST levels.

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