ORIGINAL ARTICLE

Viral Load and Alanine Amino Transferase (ALT) in Hepatitis B Positive Individuals at a Tertiary Level Care Hospital

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ABSTRACT

Objective: Objective of the study is to see the Co-relation in between ALT and viral load of HBV positive individuals in a tertiary care facility of Rawalpindi.

Study Design: This was a cross sectional study using facility based data of diagnosed and treated patients.

Place and Duration of Study: Study was conducted during the first six months of 2019 from first January to 30th June at liver center Holy family Hospital.

Materials and Methods: This was a cross sectional study carried out in a tertiary level care facility of Rawalpindi, the duration of the study was from January 2019 to June 2019. All patients with HBV positive and age above 18 years investigated admitted recorded followed up from January 2019 to June 2019 were included. Sampling method was Non-probability universal sampling. Data was collected through questionnaire mentioning all the required variables. Data was entered and analyzed by using Statistical package for social sciences version 21 for frequencies cross tabulations and co relation.

Results: Co-relation was checked in between the ALT and viral load. It was observed that apparently there is no co relation in between the ALT and the amount of viral load. Statistically there is slightly negative correlation in between the ALT and the viral load and even it can be said no co-relation.

Conclusion: ALT is not the true representative of viral load in hepatitis B. A low ALT can present with high viral load and high ALT can be found with low viral load. Therefore the treatment and prognostic models should not be only relied upon ALT as commonly done by the general practitioners.

Key Words: *Chronic Hepatitis B, Serum ALT, Viral Load.*

Introduction

Hepatitis B is a major public health problem all over the world. In the past it was known as serum hepatitis. Almost two billion people in the world have evidence of current or past HBV infection; More than 350 million are carriers of HBV infection. Carriers harbor the virus in their liver and cause about 620000 deaths. Another important fact about this infection is that HBV causes 60-80% of all liver primary cancers. South East Asia region is the main affected region and one third of the population is infected. Around 80 million carriers of HBV which is 6% of the world population are at increased risk of developing cirrhosis, hepatic decomposition, and hepatocellular carcinoma (HCC).[1] This is the 10th leading cause of death worldwide, death toll reaches to 0.5 to 1.2 million deaths average 620000 occur annually by chronic hepatitis, cirrhosis, and hepatocellular carcinoma.[2] There are 1.25 million people In the United States who are hepatitis B carriers and are positive for hepatitis B surface antigen (HBsAg) for more than 6 months.[3] The prevalence rates in Europe and North America is less than 1%. The global prevalence of HBsAg varies greatly and country to country, defined as having a high HBsAg carriers ≥ 8% , intermediate 2% to 7%, and low < 2%. The prevalence is higher among those who immigrated from high or intermediate prevalence countries.[4]

Pakistan is highly endemic with HBV, various studies has been conducted, among 4,000 volunteers, 180 (4.5%) tested positive for HBsAg and 20 (0.5%) were positive for HBs antibodies. Out of 180 HBsAg positive samples, 150 showed a single HBV D genotype infection; 29 showed co-infection of

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genotypes B and D; and 1 exhibited co-infection of genotypes C and D.[5] One of the studies given the results that nine million people are infected with HBV and the carrier rate is 3.5 to 7% which indicates prevalence with intermediate ranking.[3]

A systemic review of 26 prospective studies done by Mommeja Marin et al showed significant co-relation between viral load and various marker of disease activity like ALT and serological response. Lin et al. also correlate virological parameters of progressive disease with high and normal ALT. literature strongly proves that HBV is a progressive and potentially fatal and the problem should be addressed as soon as possible for better control.[6] Assessing the association between viral load and ALT is necessary for proper screening, identifying high risk people and their proper management. For the treatment of the individual with elevated ALT is an important factor in the decision making to initiate the treatment.[7] The objective of our study is to see the co-relation and association between ALT and viral load in HBV positive individuals. Raised ALT is a threat presenting liver cell injury.[8] In countries like Pakistan where diagnostic and treatment facilities for hepatitis B are scarce and majority of population is on mercy of general practitioners or quacks. GPs are also not familiar with the proper management of hepatitis B. This study will provide awareness to those remote area general practitioners, the general population and health care providers that raised ALT may be alarm for some serious consequence. On the other side of the spectrum hepatitis B patients with normal ALT do not mean that the person is alright and no action is warranted.[9]

Objective of the study was to see the Co-relation in between ALT and viral load of HBV positive individuals in a tertiary care facility of Rawalpindi. This will be a cross sectional study using facility based data of diagnosed and treated patients during the first six months of 2019 from 1st January to 30th June. The data utilized will consist of demography, gender, and diagnostic investigations including routine and specialized investigations like PCR and genotyping if available.

Materials and Methods

This was a cross sectional study carried out in a tertiary level care facility of Rawalpindi, the duration of the study was from January 2019 to June 2019. All patients with HBV positive and age above 18 years investigated admitted recorded followed up from January 2019 to June 2019. All other patients without HBV and age less than 18 years not investigated admitted recorded followed up before 1st January 2019 or after 30th June 2019 in the same facility or any other facility. Sampling method was Non-probability universal sampling and all patients as per inclusion and exclusion criteria from 1st January 2019 to 30th June 2019 were taken into account. Data was collected through questionnaire mentioning all the required variables. Data was entered and analyzed by using Statistical package for social sciences version 21 for frequencies cross tabulations and co relation. Approval was taken from Institutional Research Forum and Ethical Review Committee of IIMC, No harm or ethical issue is involved as the secondary data was collected. No direct involvement of patient is there.

Results

Total number of 103 was fulfilling the inclusion and exclusion criteria during the study period. Age and gender distribution can be depicted from the Table I. It's quite evident more males are infected with hepatitis B than females 77 males and 26 females. It's also seen that 18-30 is the age group mostly affected both in males and females. The infection rate decreases as the age advances.

Table I: Age and Gender Distribution of the Patients

		Age of the Patient					Total
		18-30 Years	31-40 Years	41-50 Years	51-60 Years	61-70 Years	
Gender of the Patient	Male	48	17	10	1	1	77
	Female	13	11	2	0	0	26
Total		61	28	12	1	1	103

Thirty nine percent of the patients were having ALT less than 40iu, 32% between 41 and 100iu, 15% 101-150iu, 6% between 151-200, 1% 201-250iu, 4% between 251-300, 1% between 301-350 and 2% 451-500.

Regarding the viral load the percentage of the patients was 24% were having viral load 2001 to 50000, 12% between 50001 to 100000, 31% between100001 to 1000000, 10% from 1000001to 2000000, 2% in between 2000001 to 30000000 and 22% more than 3000000.

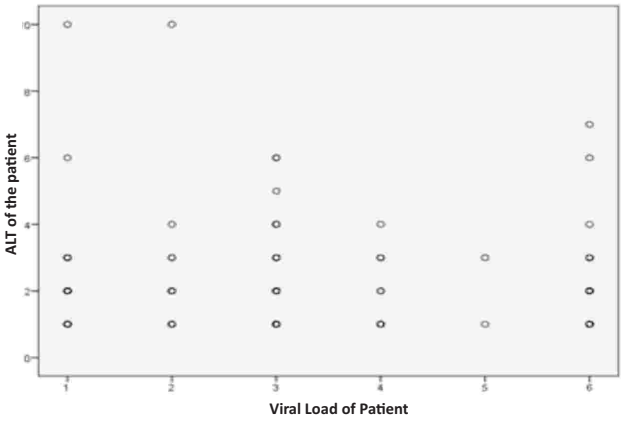
Table II: ALT and Viral Load in Patients

		Viral Load of Patient					
		< 50000	50000-100000	100001-1000000	1000001-2000000	2000001-3000000	> 3000000
ALT of the Patient	1-40 Units	9	4	14	5	1	7
	41-100 Units	10	4	8	2	0	9
	101-150 Units	4	2	4	2	1	3
	151-200 Units	0	1	3	1	0	1
	201-250 Units	0	0	1	0	0	0
	251-300 Units	1	0	2	0	0	1
	301-350 units	0	0	0	0	0	1
	451-500 units	1	1	0	0	0	0
Total		25	12	32	10	2	22

Co-relation was checked in between the ALT and viral load which depicted as shown in the following graph. It was observed that apparently there is no co relation in between the ALT and the amount of viral load. Statistically there is slightly negative correlation in between the ALT and the viral load and even it can be said no co-relation.

Table III: Correlations

		ALT of the Patient	Viral Load of Patient
ALT of the patient	Pearson Correlation	1	-.022
	Sig. (2-tailed)		.824
	N	103	103
Viral Load of Patient	Pearson Correlation	-.022	1
	Sig. (2-tailed)	.824	
	N	103	103



Graph: 1

Discussion

The study addresses the issue of detection by some easy non-invasive test relationship which exists in between the commonly used ALT and viral load in liver disease or this relationship can stratify the liver disease severity in hepatitis B patients.[10] ALT/AST and viral load both of the indices represent degrees of hepatic inflammation rather than hepatic fibrosis.[11] In literature no apparent evidence was found and if available scarcely show any relationship in between the ALT and viral load in hepatitis B. Most of the literature does not provide direct relationship in between the two entities.[12] In present study an attempt was made to see the relationship in between ALT and viral load. The study provides evidence that there is no relationship and even negative relationship in between the two. This study will sensitize the general physicians in countries like Pakistan where limited health care is available to masses and specialized care is a dream for the poor's and destitute.

Most of the studies are based on specialized care of hepatitis B but the question is that the general population and community physicians commonly rely on the routine liver function tests and if they find them within normal range are satisfied that the disease like hepatitis B is no threat.[13] The motive of this study is that the community physicians in Pakistan should be informed motivated and guided that even if the ALT is normal in Hepatitis B patients that does not mean that the virus load is also below the required level. As the present study points out that 33% of patients with viral load more than three million were having ALT less than 40 IU and fifty percent were having ALT level below 100 but the viral load was more than three million. The viral load could be highest even with normal ALT level, and we should proceed further for steps to cure the problem in addition to the necessary preventive and curative measures to eliminate the problem.[14]

Conclusion

From the study, it can be concluded that ALT is not the true representative of viral load in hepatitis B. A low ALT can present with high viral load and high ALT can be found with low viral load. Therefore the treatment and prognostic models should not be relied upon ALT as commonly done by the general practitioners.

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