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Consequence of Protective Applications on Prevalence of HCV Infection Patients at Tamilnadu

Prakash Rao BR, Abarna V, Jayalakshmi G*

Department of Microbiology, Sri Lakshmi Narayana Institute of Medical Sciences, Affiliated to Bharath Institute of Higher education and Research, Chennai, Tamilnadu, India

ABSTRACT

Background: Hepatitis C virus (HCV) infection is a major public health concern, and diagnosing an HCV infection necessitates the detection of multiple serologic markers. HCV infection is the most common cause of serious liver damage in the globe. Methods: The study population includes 115 cases, 85 HCV patients, and 23 healthy controls who all live in the same area. Hepatitis C infection is associated with specific changes in serum levels of antigens and antibodies. The goal of this study was to show certain biochemical alterations in chronic Hepatitis C virus (HCV) infection in the Indian state of Tamilnadu. SPSS version 20.0 was used to analyse the data.

Results: The current investigation intends to determine the state of biochemical alterations in Hepatitis C virus patients in Tamilnadu and elsewhere. The contents of HCV samples were assessed for ALT (Alanine aminotransferase), AST (Aspartate aminotransferase), ALP (Alkaline Phosphatase), TSB (Total Serum Bilirubin), and FBS (Fasting Blood Sugar). Conclusion: Chronic HCV infection causes aberrant serum aminotransferases (ALT and AST), but has no influence on ALP or TSB levels. Among alcoholics, the prevalence of chronic HCV infection rises. Except for the tiny number of heavy drinkers who remain positive for HBsAg, hepatitis C virus infection has little effect on the development of chronic liver disease in heavy drinkers.

Key words: Alanine aminotransferase, Chronic Hepatitis-C virus, Alkaline phosphatas, Viral hepatitis

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Corresponding author: Jayalakshmi G

e-mail✉: jayalakshmi.2k15@gmail.com

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INTRODUCTION

Hepatitis C virus (HCV) infection is the world's most frequent serious liver infection and is a public health concern. The discovery of many serologic markers is required for the categorization of an HCV infection [1-3]. Hepatitis C is caused by the hepatitis C virus (HCV), which assaults liver cells and can result in liver failure, cirrhosis (scarring), or cancer later in life. When healthy persons are exposed to the hepatitis C virus (HCV), over 90% of them recover on their own and acquire the protective surface antibodies. However, 10% of infected adults, 50% of infected children, and 90% of infected neonates are unable to rid themselves of the virus, resulting in chronic infection.

These individuals should be evaluated by a gastroenterologist for hepatitis C virus [4]. Serological testing is an essential method for detecting HCV infection [5]. Hepatitis C is a viral infection that causes acute and chronic liver disease [6]. It has a high incidence and prevalence worldwide.

HCV is a double-stranded DNA virus that is related to duck hepatitis virus, woodchuck hepatitis virus, and ground squirrel hepatitis virus in the hepadna virus family. Based on an 8 percent or more inter-group divergence in the whole nucleotide sequence, HCV is usually categorized into eight genotypes (A to H). The prevalence of specific genotypes varies by region. Genotypes may also be related to clinical outcomes and interferon response. Despite the fact that genotype testing is not required in routine clinical practice, it may be advised for HBeAg-positive patients who are considering interferon therapy because genotype-positive patients respond better.

HCV infection can also be diagnosed by immunohistochemistry staining for HBsAg or Hepatitis C core antigen (HBcAg) in liver tissues, as well as HCV DNA detection by Southern hybridization, in-situ hybridization, or PCR. Hepatitis C infection is present in more than 2 billion people worldwide, according to serological data. 400 million of them are chronic carriers,

with 500,000 to 1.2 million dying per year from cirrhosis and hepatocellular carcinoma [7].

The discovery of Australia antigen, now known as Hepatitis C surface antigen, changed the diagnosis of hepatitis C virus (HCV) infection (HBsAg). Serologic tests for HBsAg and other HCV antigens and antibodies were developed throughout the next two decades [8,9].

In the Indian state of Tamilnadu, chronic HCV is linked to numerous morphological, epidemiological, physiological, biochemical, and immunological alterations in alcoholic patients. Such knowledge will undoubtedly be required as a background for any future studies aimed at studying chronic HCV and treating it. This research will also help researchers better understand the etiology of chronic HCV, which will lead to improvements in the creation of medications to prevent and treat the disease. The current study used samples from the Department of Microbiology, Aarupadai Vedu Medical College & Hospital, and the State of Tamilnadu, India, to achieve these goals.

MATERIALS AND METHODS

Sample collection and preparation

The goal of this study is to determine Hepatitis C serological markers in chorionic alcoholic patients. The study group was made up of 79 HCV patients who were all males and ranged in age from 20 to 60 years old. Specialist doctors collected samples as chronic Hepatitis C infection from the Department of Microbiology, Sri Lakshmi Narayana Institute of Medical Sciences, and the State of Tamilnadu, India. Clinical, biochemical, histological, and virological evidence, including HBsAg, HBsAb, HBcAb, and HCV DNA by PCR method, was used to diagnose patients with chronic Hepatitis C. After an 8-hour fast, all sera were collected in the morning.

2Healthy volunteers were chosen based on the following criteria: no alcoholism, no smoking, no history of viral hepatitis, and the absence of any acute or chronic pathology clinically evident at the time of examination, routine clinical checkups throughout the research period, and residency in the same geographic region. In this study, which comprised 23 healthy volunteers, ten apparently healthy people (clinically examined by expert doctors) were used as controls.

Those people were selected at random from the general public. Sera samples were taken from patients before the drug was given to them. Marker enzymes were examined using a Spectrophotometric approach in the gastrointestinal department of Aarupadai Vedu Medical College & Hospital, while other parameters were collected using a commercially available ELISA Kit. After the blood samples were centrifuged at 300 g for 45 minutes, the serum was pipetted out and filtered through a 0.45 m membrane filter. The sera were collected and stored at –20°C until they were analysed in plastic vials.

RESULTS AND DISCUSSION

Hepatitis C surface antigen (HBsAg) and antibody to HBsAg (anti-HBs), Hepatitis C core antigen (HBcAg) and antibody to HBcAg (anti-HBc), and Hepatitis C e antigen (HBeAg) and antibody to HBeAg are antigens and antibodies associated with HCV infection (anti-HBe). During each of the stages of HCV infection, at least one serologic marker is present [10,11]. The serologic markers HBsAg, anti-HBc, and anti-HBs are commonly used to distinguish between acute, resolving, and chronic infection.

The serologic markers HBsAg, anti-HBc, and anti-HBs are commonly used to distinguish between acute, resolving, and chronic infection. HBeAg and anti-HBe testing are commonly used to manage individuals with persistent infections [12]. All indicators except HBcAg have commercially available serologic assays since no free HBcAg circulates in blood. Active HCV infection is indicated by the presence of a confirmed HBsAg-positive result in serum [13,14]. The distribution parameters of HCV serological patterns in alcoholic patients are shown in Table 1. The biochemical study in patients with isolated anti-HBc positive in relation to Hepatitis C virus and control is shown in Table 2.

Table 1: Distribution characteristics of serological patterns of Hepatitis C as determined by ECLIA assays in 79 alcoholic patients.

Serological Patterns	Serological markers*	No. of study group (n=89)	Percentage (%)
1	++ - - -	26	37
2	- - - - -	17	20
3	+ + - - +	12	14
4	+ + - + +	8	8
5	- - - - +	5	5
6	- + - + -	7	5
7	- - + - +	4	4
8	+ + - + +	4	3
9	- - - + -	3	3
10	- - - + +	3	1
Total		79	100

*Display sequence of five markers in a hepatitis C virus (HCV) screening panel: Hepatitis C s antigen (HBsAg), antibody to Hepatitis C surface antigen (anti-HBs), Hepatitis C e antigen (HBeAg), antibody to Hepatitis C e antigen (anti-HBe), and antibody to Hepatitis C total c antigen (anti-HBc), and Hepatitis C e antigen (HBeAg), antibody to Hepatitis C total c antigen (anti- + indicates a positive value, whereas - indicates a negative value. From pattern one to four, the most common patterns were 'anti-HBs (+) alone' (37%), 'negative pattern' (20%), 'anti-HBc (+) anti-HBs (+)' (14%), and 'anti-HBe (+) anti-HBc (+) anti-HBs (+)' (14%). (8 percent).

Table 2: Bio chemical analysis in patients with isolated anti-HBc positivity in relation to hepatitis C virus and control.

Parameters	HCV Positive (n=45)	HCV Negative (n=34)	Control	't' test
	Mean ± SD	Mean ± SD	(n=23)	
AST	42.13 ± 22.52	117.21 ± 98.02	12.65 ± 6.41	0.001S
ALT	51.04 ± 49.16	102.41 ± 24.16	13.32 ± 4.12	0.002S
ALP	49.32 ± 13.67	47.38 ± 14.29	52.04 ± 9.24	0.153NS
FBS	8.24 ± 1.83	9.12 ± 1.27	5.21 ± 0.48	0.001S
Total Serum billirubin (TSB) (mg %)	14.1 ± 4.23	15.02 ± 6.24	12.05 ± 2.85	0.071NS
Direct billirubin (mg %)	12.24 ± 2.45	13.46 ± 4.14	13.24 ± 3.48	0.038S
Total Proteins (gm %)	7.78 ± 1.48	6.72 ± 1.02	3.28 ± 0.24	0.004S
Albumin (gm %)	5.26 ± 0.92	4.16 ± 0.52	5.19 ± 0.64	0.023S
NS-Not significant (p>0.05), S- Significant (p<0.05)				
Statistical analysis done using student's' test.				

The results of present study indicated that, the aminotransferase enzymes will mildly elevate in chronic HCV infection and this finding is consisted with other study done by Krugman et al. [15], who found that in chronic HCV infection and during the one year period of study 89% of the patients yielded continuously normal ALT levels, while 11% showed at least one ALT value above the normal levels (ALT more than 1.2 time of normal value). The serum ALT levels are constantly normal in 57.4% of patients were HCV-DNA positive and above the normal in 42.6% of the patients. This study is in agreement with other a prospective study done by Vinay et al. [16]. It showed that the ALT and AST levels in chronic HCV infection was about 60 IU/L for the testing hospital before or at enrolment. In a study done on the chronic HCV, the incidence of ALT values increase with increment hepatic fibrosis, and a liver biopsy should be considered in patients with high normal ALT. The ALT is consistently higher than AST with chronic hepatic injury and these results are the same as in present study results.

Using a spectrophotometer set to 510 nm, the amount of phenol produced was calculated calorimetrically. The method utilised was hydrolysis of phenyl phosphate, which resulted in the release of phenol and the creation of phosphate. The current investigation found no significant changes in ALP between patients and controls, with mean ALP values of (45.32 14.67 U/L) for HCV patients and (50.04 9.24 U/L) for the control group. To put it another way, an increase in ALP in chronic HCV is unusual.

This conclusion is consistent with a previous study19, which found that AP was elevated over the reference limit in less than 10% of instances investigated, with roughly 90% of those individuals having normal values. In another research of uncomplicated hepatitis, the presence of elevated AP above the normal limit was seen in less than 8% of cases20. There was no statistical difference in the slight rise of serum AP in chronic HCV infection.

The mean FBS (Fasting Blood Sugar) values for patients (7.24 1.83 mmol/L) and the control group (4.21 0.48 mmol/L) were found to be significantly different in this study. There were no significant statistical differences in mean values of TSB (Total Serum Bilirubin) between the patients (14.1 4.23 mol/L) and the control group (12.05 2.85 mol/L) in this study, which is consistent with the findings of those who stated that the serum bilirubin level is normal in chronic viral hepatitis. After enzymatic oxidation in the presence of glucose oxidase, the glucose is measured.

Under the catalysis of peroxidase, the generated hydrogen peroxide combines with phenol and 4-aminophenazone to produce a red-violet quinoneimine dye as an indicator. At 546 nm, the absorbance of standards and samples is compared to a reagent blank. This finding suggests that in chronic HCV infection, which differs from acute HCV infection23, the TSB did not increase. The results of this study revealed that total proteins and albumin levels differ significantly between patients and controls, with mean total protein and albumin levels of 5.69 1.48 and 4.26 0.92 mg percent for HCV patients and 3.18 0.24 and 4.19 0.64 mg percent for the control group, respectively.

This finding suggests that total proteins and albumin levels rise in chronic HCV infection, as opposed to acute HCV infection20, 23. The SPSS software package, version 20.0, was used to conduct the statistical analysis. The data was presented in the form of a mean and standard deviation. Analysis of variance was used to examine the data (ANOVA). Statistical significance was defined as a probability level (p-value) of less than 0.05. The differences between the groups were investigated using the Student's t-test.

CONCLUSION

The results of this study show that sera from people with alcoholic hepatitis interfere with the liver's normal function; the main cause is chronic alcoholism. Previous residence in countries with a high frequency of the virus, as well as previous parenteral treatment and blood transfusions, were linked to the presence of Hepatitis C viral infection indicators. Hepatitis C virus infection does not increase the risk of chronic disease in heavy drinkers, save in the small percentage that test positive for HBsAg.

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