

Prevalence of Hepatitis C Virus in Patients of Chronic Liver Disease in Farrukhabad, (India)

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Abstract

Hepatitis C is an infectious disease affecting the liver, caused by the hepatitis C virus (HCV). The infection is often asymptomatic, but once established, chronic infection can progress to scarring of the liver fibrosis, and advanced scarring cirrhosis which is generally apparent after many years. In some cases, those with cirrhosis will go on to develop liver failure or other complications of cirrhosis, including liver cancer.^[1] The hepatitis C virus (HCV) is spread by blood-to-blood contact and a major cause of chronic liver disease, with ~170 million people infected worldwide^[2]. Approximately 18 million people in India are estimated to be infected with hepatitis C virus (HCV)^[3]. HCV infection is chronic in 75% to 85% of infected individuals^[4] The present study was carried out to detect the prevalence of hepatitis C in patients of various liver diseases including patients suffering from acute, fulminant, chronic viral hepatitis, cirrhosis of liver, and Hepatocellular Carcinoma etc. This study will include a total number of 300 patients, in the age range between 10 - 70 years of either sex. 30 Control for this study will be selected among the healthy staff.

Prevalence of HCV in liver disease patients. This study included 300 patients of liver disease, out of these only 12(4%) patients were detected to be positive for anti-HCV antibodies. The prevalence of anti-HCV antibodies in various clinical groups was 2.9% in AVH patients, 2.4% in CVH patients, 9.5% in cirrhosis and 25% in HCC patients. Prevalence of HCV infection in relation to Sex. In the present study, 7(58.3%) males and 5(41.7%) females were positive for HCV with a sex ratio of 1.4:1 showing a slight preponderance of males for HCV infections. Chatterjee et al. (2001)^[5]. Age Distribution of HCV positive cases. Among the HCV positive patients maximum positivity was found in 60-70 (7.2%) and 50-60 years (6.3%) and (5.9%) in 30-40 years age groups cases of liver cirrhosis.

Key words: HBV, HCV and Chronic liver diseases.

Introduction

Hepatitis caused by HCV has become a major emerging infectious disease, affecting the liver, caused by the hepatitis C virus (HCV). The infection is often asymptomatic, but once established, chronic infection can progress to scarring of the liver fibrosis, and advanced scarring cirrhosis which is generally apparent after many years. In some cases, those with cirrhosis will go on to develop liver failure or other complications of cirrhosis, including liver cancer.^[1] The hepatitis C virus (HCV) is spread by blood-to-blood contact and a major cause of chronic liver disease, with ~170 million people infected worldwide ^[2]. Approximately 18 million people in India are estimated to be infected with hepatitis C virus (HCV)^[3]. HCV infection is chronic in 75% to 85% of infected individuals^[4]

The interaction between HBV and HCV appears to be still more complex. HCV appears to suppress HBV replication and causes more severe liver damage (Fong et al. 1991)^[6]. Sheen et al. (1994)^[7]

suggested that HCV is the most important heterotropic virus that enhances HBsAg clearance in chronic HBV infection and subsequently takes up the role of HBV to cause persistent Hepatitis with ALT elevation (Liaw et al. 1994)^[8]. Studies suggest that infection with HCV and HBV are associated with reduced survival (Okenga et al. 1997)^[9] and main cause of death among these patients is liver failure.

Prevalence studies of HCV in liver disease

A study from Taiwan by Chen et al. (1990)^[10], among 392 patients with chronic liver disease documented the prevalence of anti-HCV to be 65% in chronic hepatitis patients, 43% in cirrhosis patients and 63% in patients of HCC.

Italy, Colombo et al. (1991)^[11] reported the prevalence of HCV among 132 patients

of cirrhosis and HCC. Anti- HCV antibodies were detected in 74% patients of cirrhosis and 65% patients of HCC. Simmonetti et al. in 1992^[12] reported that, out of 1,212 patients of cirrhosis and HCC, 71% of patients were anti-HCV positive.

In India, various workers have reported prevalence of HCV in liver diseases patients to be between 5-10% (Sarin et al 1996)^[13].

Amarapurkar et al. (1992)^[14] reported from the western part of India (Bombay) among 126 patients of chronic liver disease that, 21(16.6%) were anti-HCV positive and out of it 8(38%) had received blood transfusion previously. HCV was present in 15-20% of patients with CLD.

In Kashmir (Khuroo et al. 1993)^[15], the prevalence of HCV was assessed in 14 patients with epidemic NANBH, 42 patients with sporadic NANBH, 14 chronic hepatitis and 26 cirrhosis patients by ELISA.

Arankalle et al. (1995)^[16] from Bombay.

In Indore (Jaiswal et al., 1996) to find the prevalence of anti-HCV, in 789 subjects of hepatitis, renal failure, thalassaemia and healthy voluntary blood donors. The prevalence of HCV was low (4.85%) among 103 patients of acute viral hepatitis (AVH) while it was higher (25.64%) among 117 patients of chronic liver disease (CLD) with the highest rate of 31.57 percent among 57 patients of cirrhosis.

Berry et al (1998)^[17] detected anti-HCV antibodies alongwith HCV-RNA using RT-PCR techniques and it was found that of the 55 patients (Chronic hepatitis 17, cirrhosis 32, HCC 6), 22 (40%) were HCV positive.

In north India, Sarin et al. (1996)^[18] studied the prevalence of HCV infection in 148 biopsy proven non-alcoholic chronic, liver disease patients (73 with history of

transfusion and 75 non- transfused) by second generation EIA, RIBA-III and PCR. 16(10.8%) patients of cirrhosis were HCV positive and dual infection of HCV and HBV was seen in 20(13.5%) patients.

In another study from north-India **Sood et al. (1999)**^[19] reported the prevalence of HCV infection in 85 CLD patients.

Other studies from north-India have reported the prevalence of HCV in various liver disease patients as, 43% in fulminant hepatitis and 42% in CAH (**Tandon et al. 1991**)^[20]. Singh et al (1991) documented prevalence of HCV as, 37.5% in AVH, 12.5% in fulminant hepatitis and 9% in liver cirrhosis patients. **Mehta et al. (1992)**^[21] reported the prevalence of HCV to be 27% in AVH, 38.4% in fulminant hepatitis and 39% in CLD. Irshad et al. in 1995 reported prevalence of HCV to be 12.5% in AVH, 43.6% in fulminant hepatitis, 48.5% in CAH and 8.8% in cirrhosis patients respectively.

Sumathy et al. (1993)^[22] has reported prevalence of HCV from southern India as 2.5% in AVH, 35.2% in CAH patients, 23.9% in CLD and 19% in cirrhosis patients. Another study from south-India by Issar et al. 1995 documented prevalence of HCV in CLD patients to be 26% and 35.4% in cirrhosis patients.

Chatterjee et al. (2001)^[5] conducted a study in Calcutta among 84 patients (62 of cirrhosis, 22 of chronic hepatitis) and reported that 7(8.33%) patients with chronic hepatitis, 5(8.06%) patients with cirrhosis and 2(9.09%) of chronic active hepatitis were HCV positive.

MATERIAL AND METHODS

The present study was undertaken on 300 clinically diagnosed cases of chronic liver disease with a 3 to 6 months history of liver disease as demonstrated by abnormal aminotransferase levels over a period of 2010 to 2013. Detailed history was taken and serum bilirubin and aminotransferase levels of each patient was recorded. Blood samples were collected after obtaining written consent and pre-test counselling. Blood from 30 healthy, age matched health staff without any evidence of disease was also collected. Serum was separated and tested for the presence of hepatitis B surface antigen (HBsAg) by ELISA method using 3rd generation screening. Kit (ERBA LISA TEST HEP B TRANSASIA Biomedicals Ltd) and anti-HCV antibody by invitro ELISA was done by 3rd generation Kit (ERBA ELISA TEST HEP C, TRANSASIA Biomedicals Ltd). The tests were performed according to the manufacturer's instructions provided in the kit. In all the positive cases associated risk factors and predominant signs and symptoms were noted. Bilirubin and aminotransferase levels were studied in positive cases and were correlated with serological findings.

Results:

Thirty six point three per cent of the samples were positive for HBsAg. 3.7% were positive for antibodies against HCV, and 0.33% were positive for antibodies against HCV & HBV both.

Table I: Serological markers in patients of chronic liver disease.

TABLE- I

Prevalence of HCV, HBV and coinfection in study and control group (n=300)

With sex wise distribution

Elisa Test performed	Study group (n=300)		Control group (n=30)	
HbsAg only	109	M=77	2	M=0
	(36.3)	F=32	(6.7)	F=2
Anti HCV only	11	M=7	0	M=0
	(3.7%)	F=4	(0)	F=0
HBsAg and anti-HCV	1	M=0	0	M=0
	(0.33%)	F=1	(0)	F=0
Total	121	M=84	2	M=0
	(40.3)	F=37	(6.7) (p<0.01)	F=2

In the control group only two cases was positive for HBsAg.

Table II: Signs and symptoms in HBsAg positive, HCV and co-infection seropositive patients.

TABLE- II

COMMON SYMPTOMOLOGY ASSOCIATED WITH ELISA HBsAg and Anti-HCV ELISA POSITIVE PATIENTS

Symptoms	HBsAg (N =110)		HCV (N=12)	
	HBsAg +	%	HCV +	%
Anorexia	90	81.8	10	83.3
Nausea	91	82.7	9	75
Vomiting	71	64.5	8	66.7
Head ache	82	74.5	8	66.7
Arthralgia	70	63.4	7	58.3
Myalgia	50	45.5	5	41.7
Chronic Diarrhoea	12	10.9	2	16.7
Loss of weight	48	43.6	5	58.3
Pruritis	74	67.3	4	33.3 (p<.05)
Pain in Rt hypochondrium	33	30	4	33.3
Yellowish-discoloration of sclera	64	58.2	6	50
Fatigue	98	89.1	10	83.3
Fever	77	70	8	66.7
Swelling of abdomen	38	34.5	8	66.7 (p<.05)
Altered sensorium	15	13.4	3	25

Table III: Risk factors (probable mode of acquisition) in HBsAg positive and HCV seropositive patients.

TABLE- III

Possible risk factors in Elisa HBsAg and Elisa HCV positive patients

Risk Factors	HBsAg (N=110)		HCV(n=12)	
	HBsAg +	%	HCV +	%
Needle prick	51	46.4	4	33.3
Tooth extraction	10	9.1	1	8.3
Blood Transfusion	7	6.4	1	8.3
Blood donation	1	0.9	-	-
Contact with hepatitis case	3	2.7	-	-
Contact with sex workers	6	5.5	1	8.3
Minor surgery	1	0.9	-	-
Major surgery	3	2.7	1	8.3
Infected spouse	1	0.9	-	-
Unknown	8	7.3	3	25
Injectable drugs	2	1.8	1	8.4

Table IV-1&2: AST and ALT levels in seropositive cases of viral hepatitis.

TABLE NO- IV-1

DIAGNOSIS WISE DISTRIBUTION OF ELISA ANTI-HCV POSITIVE AND HBsAg POSITIVE PATIENTS ACCORDING TO AST (SGOT) LEVELS

AST RANGE (SGOT) LEVELS IN IU/L	ANTI-HCV POSITIVE PATIENTS (NORMAL RANGE: 2-20 IU/L) (N=12/300)		HBsAg POSITIVE PATIENTS (NORMAL RANGE: 2-20 IU/L) (N=110/300)	
	Total	Control group	Total	Control group
0-10	-	27 (90)	-	27 (90)
10.1-20	-	3 (10)	5 (4.5)	3 (10)
20.1-30	5 (41.7)	-	7 (6.4)	-
30.1-40	6 (50)	-	22 (20)	-
40.1-50	1 (8.3)	-	17 (15.5)	-
50.1-60	-	-	14 (12.7)	-
60.1-70	-	-	11 (10)	-
70.1-80	-	-	14 (12.7)	-
80.1-90	-	-	11 (10)	-
90.1-100	-	-	1 (0.9)	-
100.1-110	-	-	2 (1.8)	-
110.1-120	-	-	2 (1.8)	-
>120	-	-	4 (3.6)	-
TOTAL	12 (100)	30 (100)	110 (100)	30 (100)

*Values in parenthesis indicate percentage.

AST = Aspartate Amino Transferase

In (> 120 IU/L) range: 1=190, 1=250, 2=300

TABLE NO- IV-2

DIAGNOSIS WISE DISTRIBUTION OF ELISA ANTI-HCV AND ELISA HBsAg POSITIVE PATIENTS ACCORDING TO ALT (SGPT) LEVELS

ALT (SGPT) Range in IU/L	ANTI-HCV POSITIVE PATIENTS (NORMAL RANGE: 2-15 IU/L) (N=110/300)		HBsAg POSITIVE PATIENTS (NORMAL RANGE: 2-15 IU/L) (N=110/300)	
	Total	Control group	Total	Control group
0-7	-	25 (83.3)	-	25 (83.3)
7.1-15	-	5 (16.7)	-	5 (16.7)
15.1-20	-	-	2 (1.8)	-
20.1-30	1 (8.3)	-	11 (10)	-
30.1-40	6 (50)	-	8 (7.3)	-
40.1-50	4 (33.3)	-	19 (17.3)	-
50.1-60	1 (8.3)	-	19 (17.3)	-
60.1-70	-	-	17 (15.5)	-
70.1-80	-	-	12 (10.9)	-
80.1-90	-	-	14 (12.7)	-
90.1-100	-	-	3 (2.7)	-
100.1-110	-	-	1 (0.9)	-
110.1-120	-	-	-	-
> 120	-	-	4 (3.6)	-
Total	12 (100)	30 (100)	110 (100)	30 (100)

*Values in parenthesis indicates percentage(p<0.01).

In (>120 IU/L) range: 1=190, 1=250, 2=300

.ALT = Alanine Amino Transferas

Table V: TSB levels of various parameters in seropositive cases of viral hepatitis.

TABLE NO- V

DIAGNOSIS WISE DISTRIBUTION OF ELISA HBsAg AND ANTI-HCV ELISA POSITIVE PATIENTS ACCORDING TO TSB LEVELS

TSB range in mg%	ANTI-HCV ELISA POSITIVE (NORMAL RANGE: 0.2-1.2 MG%) (N=12/300)		HBsAg POSITIVE (NORMAL RANGE: 0.2-1.2 MG%) (N=110/300)	
	Total	Control group	Total	Control group
0-0.6	-	22 (73.3)	-	22 (73.3)
0.7-1.2	-	8 (26.7)	-	8 (26.7)
1.3-2	3 (25)	-	12 (10.9)	-
2.1-4	3 (25)	-	48 (43.6)	-
4.1-6	4 (33.3)	-	24 (21.8)	-
6.1-8	2 (16.7)	-	18 (16.4)	-
8.1-10	-	-	4 (3.4)	-
10.1-12	-	-	2 (1.8)	-
12.1-14	-	-	2 (1.8)	-
14.1-16	-	-	-	-
Total	12 (100)	30 (100)	110 (100)	30 (100)

*Values in parenthesis indicate percentage. TSB = Total Serum Bilirubin

Discussion:

In the present study conducted in 300 clinically diagnosed cases of chronic liver disease, 36.3% cases were positive for HBsAg. Whereas in other studies it has

been reported to be 40% and 43.7%^[23,24]. It might be because in these studies various viral markers such as HBsAg, HBeAg, and antibodies to HBeAg were detected. HCV positivity in the present

study was 3.7%. It has been reported to be 40.80% which is quite high in a study conducted in Pakistan^[25]. It might be because the results vary from place to place and with the type of test used. Other authors^[5,23] have shown it to be 8.33%, 4.26% from cases of chronic active hepatitis respectively. 0.33 per cent were positive for antibodies co-infection was present in one, whereas other authors have reported it to be 2.59%^[26]. Liver disease has become an important cause of morbidity and mortality in patients. Dual infection of HBV and HCV was found in 0.3% in the present study. In another study it has been reported to be 5% and more than 30% by other authors^[27,28]. The other causes of hepatitis such as alcoholism and drug toxicity were excluded. Bilirubin levels among hepatitis B and hepatitis C in the present study coincided with the study of Arora et al^[23].

AST and ALT Levels table IV, were almost twice in hepatitis B cases than hepatitis C cases. This is in concordance with the fact that enzyme levels in HCV are moderately elevated, fluctuating, and sometimes normal^[29]. In the present study jaundice was the predominant sign in HBV cases which coincides with the findings of other authors^[23] and of HCV positive cases, which is in contrast to the findings of above authors who have not reported jaundice in any case.

These findings correlate with bilirubin levels. It is reported in the literature that patients with HCV infection may present in anicteric, icteric, or fulminant form. So, it cannot be distinguished solely by clinical features or by biochemical markers, and therefore serology is a must. In the present study, the probable mode of transmission could be identified in Table III positive cases. HBV is still the major cause of chronic liver disease, followed by HCV in this part of the country. Co-infection has been observed, and there is

a danger of the devastating trio infecting a large proportion of cases. The prospects of a vaccine for HCV and HIV are still remote. So, great stress must be laid on proper preventive measures such as screening of blood, safe sexual practices, proper sterilisation of instruments, proper disposal of contaminated material, and immunisation of people at risk particularly health care workers.

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