

ORIGINAL ARTICLE

Prevalence of Hepatitis B and C Viral Infections in Chronic Liver Disorder

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ABSTRACT

Background and aim: Hepatitis is a liver infection caused by a variety of viruses and is a major public health issue worldwide. Hepatitis B and C are common liver infections caused by HBV and HCV that spread through sexual contact, contaminated blood product and contaminated needles. The present study aimed to determine the prevalence of hepatitis B and C in chronic liver disorders.

Material and Methods: This prospective study was conducted on 136 chronic liver disease patients in the department of Pathology in collaboration with Gastroenterology, Ayub Teaching Hospital Abbottabad from August 2021 to January 2022. Patients above 18 years of age and clinically diagnosed with chronic liver disorder were enrolled. Chronic liver disorders were diagnosed based on clinical history, impaired liver function tests, and ultrasound. A questionnaire was used to accumulate possible related factors with virus infections from patients. Qualitative immunochromatographic method was used for screening out the serum for the presence of anti-hepatitis C virus antibodies and hepatitis B surface antigen. SPSS version 26 was used for data analysis.

Results: Out of 136 chronic liver disorders, there were 88 (64.5%) male and 48 (35.5%) females. The overall mean age was 42.6 ± 6.82 years with an age range from 15 to 75 years. Of the 136 CLD, the single, married, divorced, and widow were 34 (25%), 80 (58.8%), 12 (8.8%), and 10 (7.4%) respectively. The urban and rural dwellers were 98 (72.1%) and 38 (27.9%) respectively. The prevalence of Hepatitis B surface antigen and anti-HCV antibody was 52 (38.2%) and 34 (25%) respectively. The incidence of dual HBV and HCV coinfection was 6 (4.4%).

Conclusion: The present study found that the prevalence of HBV and HCV infections were 38.2% and 25% among chronic liver disorders. HCV infections were 2.95 times higher in health facilities where dental extractions were provided compared to those who had no dental extraction facilities. All the CLD clinically diagnosed should be tested for HBV and HCV infections. Sterilization of surgical and dental instruments in proper way must be done along with public education regarding infections and transmission modes to prevent infections spreading.

Keywords: HBV, HCV, Chronic liver disorders

INTRODUCTION

Hepatitis is a liver inflammation commonly caused by viral infections. Hepatitis C virus (HCV) and hepatitis B virus (HBV) both significantly contribute to a higher proportion of liver disease worldwide [1]. These viruses might be responsible from minor damages to Hepatocellular carcinoma (HCC) and liver cirrhosis [2]. HBV and HCV approximately affected 7% and 3% of world population [3]. The viral transmission caused by common modes may lead to combined HBV and HCV infection [4]. The exposure of humans to semen, infected mother to infant at birth time, infected blood, and other body fluid transmit the HBV. HBV-contaminated blood and injection might cause HBV transmission during medical procedures. Contaminated injections and HCV-contaminated blood transfusion from infective to healthy personal are the main reasons for HCV transmission [5].

Chronic liver disease is an inflammation injury to the liver persisting for six or more months. Liver cirrhosis, chronic hepatitis, and HCC are different spectrums of chronic liver diseases [6]. Genetic variability is progressively being recognized as a key element in the prediction, surveillance, and outcome of HCV-mediated CLD [7]. Steatosis was found in 70% of liver biopsy samples from chronic HCV patients [8]. Furthermore, another study found a link between HCV genotype 3 and steatosis and fibrosis [9]. Genotype 1b is less sensitive to interferon- α (IFN- α) therapy than genotypes 2 and 3, necessitating measures to identify the various HCV genotypes. The determination of HCV genotypes has become a critical factor in determining duration of treatment and potency. Although there have been several reports on the incidence of HCV genotypes, the majority of them have focused on the predominance of genotype 3 [10]. However, no studies in the subcontinent have associated HCV and HBV infections to the severity of liver disease. Therefore, we investigated the prevalence of various HBV and HCV infection in chronic liver disease.

METHODOLOGY

This prospective study was conducted on 136 chronic liver disease patients in the Department of Pathology in collaboration with Gastroenterology, Ayub Teaching Hospital Abbottabad from August 2021 to January

2022. Patients above 18 year's age and clinically diagnosed with chronic liver disorder were enrolled. Chronic liver disorders were diagnosed based on clinical history, impaired liver function tests, and ultrasound. A questionnaire was used to accumulate possible related factors with virus infections from patients. Qualitative immunochromatographic method was used for screening out the serum for the presence of anti-hepatitis C virus antibodies and hepatitis B surface antigen. Clinically diagnosed CLD patients meeting inclusion criteria were interviewed and risk factors and sociodemographic data were collected based on a pre-designed questionnaire. Ethical approval was obtained from the research and ethical committee. Written informed consent was taken from each individual. Blood sample of 5 mL was collected and divided into two aliquots after serum separation. Screening of HBsAg and anti-HCV antibody was done using single aliquot. HBsAg single step test was used based on immunochromatography principle. In serum samples, HCV antibodies were visually detected on immunochromatographic direct binding test as a rapid Anti-HCV Test. SPSS version 26 was used for data analysis. Chi-square test was used for determining the association between measured variables. All the descriptive statistics were carried out using 95% confidence interval and 5% level of significance.

RESULTS

Out of 136 chronic liver disorders, there were 88 (64.5%) male and 48 (35.5%) females. The overall mean age was 42.6 ± 6.82 years with an age range from 15 to 75 years. Of the 136 CLD, the single, married, divorced, and widow were 34 (25%), 80 (58.8%), 12 (8.8%), and 10 (7.4%) respectively. The urban and rural dwellers were 98 (72.1%) and 38 (27.9%) respectively. The prevalence of Hepatitis B surface antigen and anti-HCV antibody was 52 (38.2%) and 34 (25%) respectively. The incidence of dual HBV and HCV coinfection was 6 (4.4%). Men were more susceptible to HBsAg 38/88 (43.2%) compared to females 16/48 (33.3%) with no significant difference (cOR= 1.29; 95%CI: 0.512-2.83, p=0.634). HBV infections were higher in the younger age group (20-35 years) in 18/28 (64.3%) but 0% in the age group >60 years. Of the anti-HCV positive infection in 34 (25%) CLD patients, females 15/48

(31.3%) were more susceptible than male 18/88 (20.5%) [cOR= 0.496 95% CI, 0.234-1.326: p=0.218]. The prevalence of HCV infection was higher in the age group 45-60 years and lowest in >60 years. Gender's distribution is shown in Figure-1. Demographic details and baseline characteristics are shown in Table-I. The prevalence of HBV, HCV, and dual HBV and HCV coinfection are illustrated in Figure-2. Table-II represents the serostatus of HBV virus and associated factors distributed in chronic liver disease whereas Table-III shows the serostatus of HCV virus and associated factors distributed in chronic liver disease.

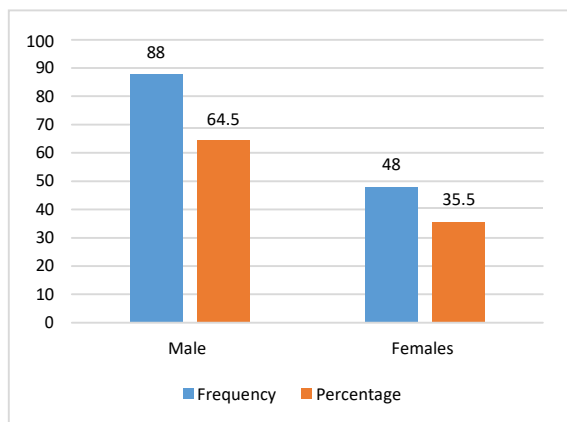


Figure-1: Gender's distribution (n=136)

Table-1: Baseline characteristics of chronic liver disease

Parameters	Value
Age (years)	42.6±6.82
Gender N (%)	
Male	88 (64.5)
Females	48 (35.5)
Marital status N (%)	
Single	34 (25)
Married	80 (58.8)
Divorced	12 (8.8)
Widow	10 (7.4)
Residence N (%)	
Urban	98 (72.1)
Rural	38 (27.9)
Occupation N (%)	
Students	38 (27.9)
Unemployed	28 (20.6)
House wife	32 (23.5)
Commercial	18 (13.2)
Gov. employed	20 (14.7)

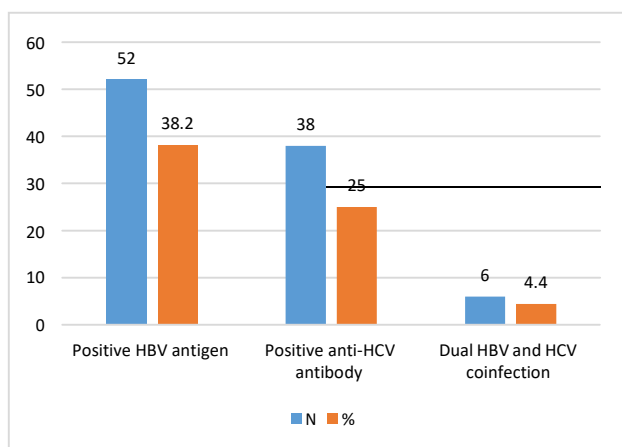


Figure-2: prevalence of HBV, HCV, and dual HBV and HCV coinfection in chronic liver disease (n=136)

Table-2: Sero-status of HBV virus and associated factors distributed in chronic liver disease

Factors	Positive HBV N (%)	OR 95% CI	P-value
Community related			
Dental extraction	14 (26.9)	1.1 (0.51–2.35)	0.87
Transmission from Jaundice patients	12 (23.1)	1.6 (0.58–3.81)	0.29
Circumcision	20 (38.5)	1.6 (0.58–3.81)	0.39
Shaving with Barber (Men)	6 (11.5)	N/A	0.29
Hospital related			
Blood transfusion'	8 (15.4)	0.42 (0.15–1.20)	0.08
Dental extraction	19 (36.5)	0.98 (0.42–2.05)	0.91
Hospitalization	21 (40.4)	0.46 (0.21–1.01)	0.04
Surgical intervention	4 (7.7)	0.32 (0.08–0.89)	0.03
Behavioral related			
Abortion	9 (17.3)	0.63 (0.12–2.78)	0.41
Delivery by Traditional birth (females)	13 (25)	0.92 (0.32–3.28)	0.89

Table-3: Sero-status of HCV virus and associated factors distributed in chronic liver disease

Factors	Positive HCV N (%)	OR 95% CI	P-value
Community related			
Dental extraction	11 (28.9)	0.81 (0.29–1.92)	0.60
Transmission from Jaundice patients	9 (23.7)	1.10 (0.38–3.12)	0.82
Circumcision	16 (42.1)	N/A	0.61
Shaving with Barber (Men)	2 (5.3)	0.56 (0.16–1.78)	0.23
Hospital related			
Blood transfusion'	4 (10.5)	1.62 (0.61–4.29)	0.30
Dental extraction	13 (34.2)	2.89 (1.19–7.15)	0.03
Hospitalization	12 (31.6)	1.03 (0.42–2.49)	0.89
Surgical intervention	9 (23.7)	0.89 (0.30–2.81)	0.91
Behavioral related			
Abortion	5 (13.2)	2.12 (0.50–8.59)	0.23
Delivery by Traditional birth (females)	6 (15.8)	1.91 (0.48–6.79)	0.35

DISCUSSION

The present study mainly focused on the prevalence of HBV and HCV infections in chronic liver disease and found that positive HBV antigen and anti-HCV antibody were 38.2% and 25% respectively. Moreover, dual HBV and HCV coinfections were found in 4.4% patients of chronic liver disorders. HCV infections were 2.95 times more common in health facilities that offered dental extraction services than in those that did not. All CLD patients who have been clinically diagnosed should be tested for HBV and HCV infections. Male patients were more susceptible to the virus HBV compared to females whereas females were more susceptible to HCV infections. A national based study reported 1.9% prevalence of HCV in CLD patients [11]. A previous study reported that incidence of HCV and HBV infections in chronic liver disease was 0% and 1% respectively without considering infection associated risk factors [12]. Another study found that HCV and HBV had higher prevalence of 25.8% and 55% respectively in chronic liver disease [13]. According to a previous study conducted on 97 chronic liver infections reported positive HBsAg and anti HBc in 24.7% and 61.1% respectively [14].

Numerous studies reported different prevalence of HBV and HCV in different countries are as follows: HCV in India 26% [15], China 75.5% [16]. HBV had a higher prevalence of 22% in Mongolia [17] and 30.4% in Pakistan [18]. Hepatitis virus leads the chronic infection to slow advancement of liver disease. This may

lead to chronic liver failure, cirrhosis, and HCC [19]. The routes of transmission for HBV and HCV are similar, so they can coexist. There is an increased risk of liver cancer with chronic HBV and HCV infection when the two infections are co-infected [20], and there is probably an increased risk of fulminant hepatitis when HCV is superinfected with chronic HBV.

According to these findings, in Pakistan, 64.9% of patients with HCV compared with 24.7% of patients with HBV in CLD [21] whereas in Iraq, 73.5% of patients with CLD were infected with HCV [22]. According to a Pakistani based study, patients with CLD had a higher prevalence of HBV of 30.4% [23]. HBV and HCV-related CLD are prevalent in Vietnam at 47% and 23%, respectively. It was found that 4.1% and 0.7% of people in the study had HBV and HCV, respectively, according to Tehreem et al. [24].

In these studies, there was a higher prevalence of HCV in comparison to HBV, which may be due to geographic variation [25]. According to studies concerning HBV infection, the rate of males infected with HBV was 4.9%, and the rate of females was 3.3% [26], and the rate of males infected with HBV was 72%, and the rate of females infected with HBV was 28% [27]. There is a higher prevalence of anti-HCV antibodies in females than in males according to a study conducted in Madagascar on prevalence of HCV.

CONCLUSION

The present study found that the prevalence of HBV and HCV infections were 38.2% and 25% among chronic liver disorders. HCV infections were 2.95 times higher in health facilities where dental extractions were provided compared to those who had no dental extraction facilities. All the CLD clinically diagnosed should be tested for HBV and HCV infections. Sterilization of surgical and dental instruments in proper way must be done along with public education regarding infections and transmission modes to prevent infections spreading.

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