International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

HBV- HCV Coinfection – Thirteen Years Expereince At Tertiary Care Center of Northeren India

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OPEN ACCESS

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Received: 20-01-2026
Accepted: 15-04-2026
Available online: 30-04-2026

ABSTRACT

Introduction: Hepatitis B and C coinfection means simultaneous infection with both the viruses and is due to sharing common transmission routes like intravenous drug use. It increases the risk of severe liver disease, including cirrhosis and hepatocellular carcinoma (HCC), compared to mono-infection. Direct-acting antivirals (DAAs) are used to treat HCV, and oral antivirals for HBV and monitoring for HBV reactivation is crucial.

Aim of Study: The aim of present study was to determine the HBV and HCV Co-infection at Tertiary care centre of Northern India.

Material and Methods: The present study was conducted to determine HBV-HCV co-infection in patients reporting at Medical Gastroenterology department of Post Graduate Institute of Medical Sciences in North India. A total of 11,500 serum samples of Hepatitis B and 12,000 of Hepatitis C confirmed patients were tested for co-infection.

Observations: A total of 11,500 confirmed patients of HBV and 12,000 of HCV were screened for co-infections. Out of this total pool of 23,500 patients, 448 patients (1.90 %) were found to be having co-infection. Out of these 448 co-infected patients, 331 (73.88 %) were males and 117 (26.12%) were females. On analysing geographical distribution of patients, majority belonged to rural area. In male group, 269 (81.26%) patients resided in rural area whereas in females, 101 (86.32%) belonged to rural area. Age distribution was characteristically different in both the groups. In males 60.41% of patients were in 20-50 yrs of age group whereas in comparison females had older representation i.e. 72.54% belonged to 40-70 yrs of age. On analysis of risk factors, there were strong differences noted in both the groups. In males, 149 patients (45.01%) were alcoholic, 188 patients (56.79%) were smokers, 105 patients (31.72%) had past history of surgery, 40 patients (12.08%) were intravenous drug abusers, 30 (9.06%) had got tattooing, 21 (6.34%) had previous history of blood transfusion, 5 patients (1.51%) gave history of multiple sexual partners, 3 (0.90%) had undergone dental procedures, 5 (1.51%) had acute hepatitis B and only 1 patient (0.30%) developed HCC. In comparison in females, 0 patients (0%) were alcoholic, 2 patients (1.70 %) were smokers, 52 patients (52.99 %) had past history of surgery, 0 patient (0 %) were intravenous drug abusers, 9 (7.69 %) had got tattooing, 14 (11.96 %) had previous history of blood transfusion, 1 patient (0.85 %) gave history of multiple sexual partners, 4 (3.41%) had undergone dental procedures, 1 (0.85 %) had acute hepatitis B and none developed HCC.

Conclusion: Surveillance for co-infections in every patient of HBV, HCV and HIV is mandatory. Timely diagnosis and institution of antiviral therapy can lead to decreased incidence of end stage liver disease, development of HCC and need of liver transplant as definitive cure. The age distribution and risk factors are different in male and female.

***Keywords**: Hepatitis B, Hepatitis C, Intravenous drug abuse, Tattooing, Surgery, Blood transfusion.*

INTRODUCTION

HBV and HCV co-infection occurs in an estimated 1-15% of chronic hepatitis cases, with higher prevalence (up to 53%) in specific high-risk groups. It is commonly transmitted through shared needles, blood products, and vertical transmission. Typically, one virus is dominant (usually HCV) and suppresses the other, though both may replicate. HCV usually predominates, and HBV replication is suppressed by HCV, through its core proteins and activation of interferons[1]**.** The hepatitis C and B viruses affect around 300 million people worldwide[2]. They typically coexist among patients in highly endemic areas or among those at great risk of infection, like those who inject drugs or homosexual men, due to shared means of epidemiological and transmission characteristics[1]. Co-infected patients often experience faster progression to liver fibrosis, cirrhosis, and higher risk of H.C.C[3]. The frequency of HCV/HBV coinfection in HBsAg-positive persons is estimated to be between 5% and 20% and between 2% and 10% in HCV-positive patients[4]. When HBV/HCV coinfected people are tracked over time, their virological patterns often reveal dynamic characteristics[5]. While DAAs effectively treat HCV, eliminating HCV can sometimes trigger HBV reactivation, necessitating simultaneous monitoring and potential management of HBV. All patients with hepatitis should be tested for both HBV and HCV. Regular monitoring of liver function tests (ALT/AST), HBV DNA, and HCV RNA is necessary. Patients should be vaccinated against Hepatitis A and HBV if they are not already immune.

MATERIAL & METHODS

The present study was conducted over thirteen years from 01.04.2013 to 31.03.2026, for determining HBV-HCV co-infection in patients reporting at Medical Gastroenterology department of Post Graduate Institute of Medical Sciences in North India. A total of 11,500 serum samples of Hepatitis B and 12,000 of Hepatitis C confirmed patients were tested for co-infection. Patients were enrolled in the study after proper consent and then tested for co-infection with other viruses. About 5 ml of whole blood was collected aseptically by venipuncture. The collected blood was allowed to clot; serum was separated by centrifugation at room temperature and then were tested for HCV, HBV and HIV by Enzyme linked immunosorbent assay. In all the enrolled patients, detailed history, physical and clinical examination was done. Every patient under- went complete biochemical examination which included complete hemogram, liver & renal function tests, viral screen, viral load, ultra sonogram abdomen, Fibroscan and upper Gastrointestinal endoscopy and Triple phase computed tomography scan wherever indicated.

OBSERVATIONS

A total of 11,500 confirmed patients of HBV and 12,000 of HCV were screened for co-infections. Out of this total pool of 23,500 patients, 448 patients (1.90 %) were found to be having co-infection. Out of these 448 co-infected patients, 331 (73.88 %) were males and 117 (26.12%) were females. On analysing geographical distribution of patients, majority belonged to rural area. In male group, 269 (81.26%) patients resided in rural area whereas in females, 101 (86.32%) belonged to rural area. Age distribution was characteristically different in both the groups. In males 60.41% of patients were in 20-50 yrs of age group whereas in comparison females had older representation i.e. 72.54% belonged to 40-70 yrs of age. On analysis of risk factors, there were strong differences noted in both the groups. In males, 149 patients (45.01%) were alcoholic, 188 patients (56.79%) were smokers, 105 patients (31.72%) had past history of surgery, 40 patients (12.08%) were intravenous drug abusers, 30 (9.06%) had got tattooing, 21 (6.34%) had previous history of blood transfusion, 5 patients (1.51%) gave history of multiple sexual partners, 3 (0.90%) had undergone dental procedures, 5 (1.51%) had acute hepatitis B and only 1 patient (0.30%) developed HCC. In comparison in females, 0 patients (0%) were alcoholic, 2 patients (1.70 %) were smokers, 52 patients (52.99 %) had past history of surgery, 0 patient (0 %) were intravenous drug abusers, 9 (7.69 %) had got tattooing, 14 (11.96 %) had previous history of blood transfusion, 1 patient (0.85 %) gave history of multiple sexual partners, 4 (3.41%) had undergone dental procedures, 1 (0.85 %) had acute hepatitis B and none developed HCC.

Table-1- Showing percentage of Co-infection and Mono-infection in study group

Total Patients	Co-infected (HBV & HCV)	Monoinfected
23,500	448 (1.90%)	23052 (98.10%)

Table 2- Showing Age group distribution in both the genders

Age Group	Male (331 patients)	Female (117 patients)
0-10 yrs	0 (0%)	0 (0%)
11-20 yrs	30 (9.06%)	2 (1.70%)
21-30 yrs	74 (22.35%)	19 (16.23%)
31-40 yrs	74 (22.35%)	11 (9.40%)
41-50 yrs	53 (16.01%)	30 (25.64%)
51-60 yrs	37 (11.17%)	35 (29.91%)
61-70 yrs	32 (9.66%)	20 (17.09%)
71-80 yrs	31 (9.36%)	0 (0%)

Table 3- Showing Distribution of various parameters in both the genders

Total Patients (448)	Male (331)	Female (117)
Rural Background	269 (81.26%)	101 (86.32%)
Urban Background	62 (18.74%)	016(13.28%)
Alcohol	149 (45.01%)	0 (0%)
Smoking	188 (56.79%)	2 (1.70%)
H/o Surgery	105 (31.72%)	52 (52.99%)
H/o Blood Transfusion	5 (1.51%)	14 (11.96%)
Tattooing	21 (6.34%)	9 (7.69%)
IV Drug abuser	40 (12.08%)	0 (0%)
Multiple Sex Partners	5 (1.51%)	1 (0.85%)
Dental Procedures	3 (0.90%)	4 (3.41%)
Hepatocellular carcinoma	1 (0.30%)	0 (0%)
Acute Hepatitis B	5 (1.51%)	1 (0.85%)
HBV inactive carrier	63 (19.04%)	53 (45.30%)
Need of HBV treatment	268 (80.96%)	64 (54.70%)

DISCUSSION

Co-dominant, HBV-dominant or HCV-dominant patterns result from coinfection, none of which is replicative. The serologic profiles could change over time. In a coinfection where HCV predominates, HCV replicates vigorously while inhibiting HBV replication. Rare coinfections with HBV predominance have little to no active HBV or HCV replication. Positive serologies of both viruses with negative PCR results, suggest that they are not actively replicating but in future, it may progress to aggressive infections[6]. Hepatitis B and C viruses are both hepatotropic and primary site of reproduction is liver but their immune responses to both acute and chronic infection differ dramatically. Both viruses residing in same liver makes situation worse. In our pool, co-infection was seen only in 1.90% which is much less in comparison to other studies[7,8] (1-15%) and reason for the same can be attributed to strict screening for co-infections in every mono-infected patient. As protocol, we always mandatory vaccinated for HBV in HCV or HIV patients. It prevents future infection of HBV in these patients. It is well proven in literature that HBV or HCV mono-infected patients can develop co- infection in future. Moreover, total free treatment including testing has led to exemplary high compliance rate, thus preventing complications of co-infections in future. Regular counselling of patients and family members throughout the course of illness helps in reducing risk factors responsible for future development of co-infections. It is multi -pronged strategy which is giving fruitful results. In mono-infections of HBV and HCV, male predominance is there but in our study group of co-infections, male predominance was more than as seen in mono-infections. The same observation was observed in geographical distribution of patients in which rural background is seen in both mono-infection and co-infection but this relationship was much stronger in latter group. In our study cohort, there was characteristic difference in age distribution of patients on basis of gender. In males, maximum patients were seen in younger age group of 20-50 yrs but female patients were predominantly seen in 40-70 yrs. The reason behind this can be explained on basis of different risk factors for counteracting co-infections in both the groups. In males, the most important risk factors were alcohol, smoking, intravenous drug abuse, tattooing, blood transfusions, past history of surgery but in female group surgery and blood transfusion were most important risk factors. Thus, as males have high risk behaviour which usually occurs in younger age group and in females, various kind of surgeries like tubectomies, hysterectomies etc. are done in later age group, hence maximum females were in 40-70 yrs age group. The same high-risk behaviour in males led to increased number of triple co-infections with HIV in males whereas in females, only one patient had triple co-infection. On similar lines of high-risk behaviour in males, acute HBV was seen more commonly in males, in comparison to females. We know that in HBV-HCV co-infection, HCV has to be always treated and decision has to be made for HBV treatment. If HBV virus is in inactive stage, then it does not merit treatment. In our study groups of both male and female, majority patients required antiviral treatment for HBV also but need was much more in male group. Only one male developed HCC in our study cohort which can be attributed to strict screening for co-infections leading to timely detection and starting of treatment. Moreover, regular counselling led to leaving habit of smoking and alcohol in majority of patients, along with maintenance of optimum body weight may have played part in lesser incidence of HCC in our study group.

CONCLUSION

Surveillance for co-infections in every patient of HBV, HCV and HIV is mandatory. Timely diagnosis and institution of antiviral therapy can lead to decreased incidence of end stage liver disease, development of HCC and need of liver transplant as definitive cure. The age distribution and risk factors are different in male and female and should be kept in mind for planning preventive strategies against these transmissible deadly diseases.

LIMITATION OF STUDY

Our study group, majority patients were uneducated or partially literate and belonged to poor socio-economic status, hence there are high chances that percentage of multiple sex partners and intravenous drug abuse may be under reported.

CONFLICTS OF INTEREST

The editors declare that there was no conflict of interest.

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