



SEROPREVALENCE OF HEPATITIS B VIRUS, HEPATITIS C VIRUS, THEIR CO-EXISTENCE AND RISK FACTORS ASSOCIATED AMONG PATIENTS ATTENDING GASTRO ENTEROLOGY OPD AND HEALTHY INDIVIDUALS (BLOOD DONORS) AT GMC, GUNTUR.

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ABSTRACT

Background: Hepatitis B and C viral infections, which are the most common cause of liver infection worldwide, are major health issues around the globe. It has become a strong need to control these infections to reduce morbidity and mortality rates. **Aim & Objectives:** The study aims to compare the Seroprevalence of the Hepatitis B Virus, Hepatitis C Virus and their Co-Existence and risk factors associated among patients attending Gastroenterology OPD and healthy individuals. **Materials and Methods:** It is a comparative study conducted at Guntur Medical College. A total of 3764 patients were selected and 812 were gastroenterology patients (GEP) and the remaining 2952 were healthy blood donors. Patients were of either gender belonging to the 6 to >61 years of age group Ethical committee approval was taken before the initiation of the study. **Results:** The male patients were more sensitive (n=515) in comparison with the female (n=297). Disease prevalence was more in the age group of 21 to 30 years (GEP-189, HBD-1185). Patients who have sexually transmitted diseases and were undergoing treatment were prone to HBV+ (n=10) and HCV+ (n=7). Participants who were Farmers were non-vaccinated in a majority (n=2118), followed by Daily wage laborers (n=238). Majority were non- vaccinated (GEP-329, HBD-2402). compared to vaccinated participants (GEP-483, HBD-550). **Conclusions:** The vaccination rate is not up to the mark except in a few occupations. If more campaigns are conducted to bring awareness to undergoing regular checkups, taking vaccination doses without fail, avoiding unprotected sex, etc. The prevalence of Hepatitis B and C viruses can be prevented.

KEYWORDS : Prevalence, Hepatitis B, Hepatitis C, HBV, HCV, Blood donors

INTRODUCTION

According to the "2030 Agenda for Sustainable Development Goals" designed by WHO, preventing Hepatitis is a need hour. Based on previous reports more than two billion people are infected with Hepatitis B virus (HBV) and another prevailing disease along with HBV is Hepatitis C virus (HCV). Per annum, 1.4 million people are dying due to HBV²³. Worldwide infectivity scenario of HCV states 170 million people are reported positive^{4,7}. Hepatitis B virus contains circular partial double-stranded DNA virus and causes liver inflammation. Hepatitis C virus (HCV) is enveloped, single-stranded RNA virus with positive polarity⁵. Both HBV and HCV are transmitted through direct contact with blood, transfusion of blood and blood products, intravenous injections, and unprotected sex^{9,10}. Patients infected with both HBV and HCV have severe liver disease¹¹.

The severity of HBV mainly depends on the person's immune ability. According to the immunity of the body, patients may report acute or chronic, symptomatic or asymptomatic¹². HCV infection has a striking tendency towards chronicity, often significant liver diseases like chronic hepatitis, cirrhosis, and hepatocellular carcinoma¹³. The disease can also be controlled by vaccination and unfortunately, there is no proper information and clarity regarding vaccination. To know the prevalence, age, occupation, and risk factors are evaluated in this study.

MATERIALS AND METHODS

Study design

It is a comparative study conducted in the Department of Microbiology for 7 months (January 2022-July 2022), at Guntur Medical College. Ethical committee approval was taken before the commencement of the study. A total of 3764 patients were enrolled in the study. The informed consent form was collected from the patients who were willing to be a part of the study.

Group allocation

1. Gastroenterology Patients (GEP)- n=812
2. Healthy Blood Donors (HBD)- n=2952

Selection Criteria

Inclusion Criteria

- Age- 6 to ≤61 years
- Male and Female

Exclusion Criteria

- Age- <5 years and >61 years
- Immunocompromised-HIV patients

Study procedure

The blood sample of the patients was collected and qualitative detection of HBsAg & anti-HCV antibodies by ELISA was performed on it. A demographic data and history were taken from the study participants to identify the associated risk factors.

Data analysis

Descriptive data was analysed and represented as Tables in the form of frequency (n) and percentages (%).

RESULTS

A total of 3764 patients were screened for the study, out of the total samples considered 812 were Gastroenterology patients and 2952 are Healthy individuals (Blood donors).

Other criteria considered are the occupation of the patients, the majority are DWL in gastroenterology patients, and in the case of healthy blood donors' the majority are farmers. The prevalence of HBsAg patients is more in comparison with HCV and HBV+HCV (Table-1). Based on occupation patients belonging to the gastroenterology group have more DWL followed by Farmers in healthy blood donors (Table-2).

In the present study, out of 812 gastroenterology patients, 297 are Male patients, 515 are female patients, 2952 are healthy blood donors, 2945 are male and 7 are female patients. In both groups, HBV male patients were more in comparison with the other two conditions (Table-3).

The age limit was of minimum 6 years and a maximum of 60+ and

based on the age, gastroenterology patients reporting HBV have majorly fallen into the age group 31-40 and for HCV it is +61 age group, both HC+HBV the reports were 1 in 40-+60 age group, whereas in case of healthy blood donors HBV was reported more in 31-40 age group and HCV was only reported in 21-30 age group and no reports of both HBV+HCV (Table-4).

Various risk factors such as unregistered health care workers + patients' attendees, Family history + STD, Patients taking treatment of SDS, Dialysis patients + family history +patient attendees + Dental extractions, and Organ transplants. Based on data in HCV-positive gastroenterology patients in males the majority of risk factors was dialysis patients' +family history + patient and in the female, it was Patients undertaking treatment for STDS. In HBV-positive gastroenterology patients in males, the majority risk factor was unregistered health workers and in females, it was Family history + STD. In HBV+HCV, dialysis, and organ transplants were reported (Table-5).

According to the data collected on the vaccination status 483 were vaccinated in gastroenterology patients and 550 got vaccinated in healthy blood donors. The majority of DWL were vaccinated in gastroenterology patients and Farmers are vaccinated more in the case of healthy blood donors (Table-6). The monthly data collected is presented in Table-7.

Table-1 Overall Seroprevalence of HBsAg & anti-HCV antibodies

Study population	Screened	HbsAg Positive	anti-HCV Positive	Both Positive
Gastroenterology Patients (GEP)	812	150	48	4
Healthy individuals (Blood Donors)	2952	25	2	0
Total	3764	175	50	4

Table-2 Occupation of the participants

Occupation	Gastroenterology patients	Healthy Individuals
Students	132	0
Health Care Workers (HCW)	26	15
Daily Wage Labours (DWL)	392	202
Truck drivers	14	0
Auto drivers	15	62
Software	23	56
Carpenters	13	2
Masons	19	20
Plumber	11	50
Farmers	85	2438
Painters	2	50
Business	12	50
House wives	66	7
Glass industry	2	0
Total	812	2952

Table-3 Gender wise distribution

Gender	Screened Patients		HBsAg Positive		anti-HCV Positive		Both Positive	
	GEP	HBD	GEP	HBD	GEP	HBD	GEP	HBD
Males	515	2945	107	25	34	2	3	0
Females	297	7	43	0	14	0	1	0
Total	812	2952	150	25	48	2	4	0

Table-4 Age wise distribution

Age Groups	Screened Patients		HBsAg positive		anti-HCV Positive		Both Positive	
	GEP	HBD	GEP	HBD	GEP	HBD	GEP	HBD
6 to 10	13	0	0	0	0	0	0	0
11 to 20	137	386	2	0	3	0	0	0
21-30	189	1185	34	8	2	2	0	0
31-40	143	855	40	14	3	0	1	0
41-50	174	502	37	3	11	0	1	0

Table-5 Risk factors identified for HCV, HBV and HCV+HBV Infection among Gastroenterology Patients (GEP)

Risk Factors	Male			Female		
	HCV	HBV	HCV+HBV	HCV	HBV	HCV+HBV
Unregistered health care workers	13	91	-	0	0	-
Family history	4	9	-	2	36	-
Patients taking treatment for STDS	10	5	-	5	3	-
Dialysis patients' history	07	-	2	3	-	1
Dental extractions	-	2	-	3	4	-
Organ transplant	-	-	1	1	-	1
Total	34	107	3	14	43	2

Table: 6 Vaccination data of Gastroenterology patients (GEP)

Occupation	Vaccinated		Not Vaccinated	
	GEP	HBD	GEP	HBD
Students	-	0	-	0
Health Care Workers (HCW)	2	15	0	0
Daily Wage Labours (DWL)	154	6	238	196
Truck drivers	10	0	4	0
Auto drivers	15	62	0	-
Software	23	56	0	0
Carpenters	2	0	11	2
Maisons	8	3	11	17
Plumber	11	15	0	35
Farmers	45	320	40	2118
Painters	2	21	0	29
Business	12	50	0	0
House wives	43	2	23	5
Glass industry	0	0	2	0
Total	483	550	329	2402

Table-7 Overall data of Jan – July 2022

MON TH	NO. OF CASES	HBsA g					anti-HCV				BOTH POSITIVE HbsAg + anti-HCV					
							Positive		Negative		Positive		Negative		Positi ve	Negati ve
							GE P	HB D	GE P	HB D	GE P	HB D	GE P	HB D	GE P	HB D
JAN UAR Y	94	164	8	6	85	158	3	0	91	164	0	0				
FEB RUA RY	35	216	13	0	22	216	1	0	34	216	0	0				
MAR CH	386	254	37	4	349	250	13	1	377	253	0	0				
APRI L	119	650	22	2	102	648	14	0	110	650	1	0				
MAY	66	525	44	5	21	520	7	0	53	525	1	0				
JUN E	53	825	17	5	32	820	5	1	50	824	2	0				
JULY	59	318	9	3	51	315	5	0	55	318	0	0				
TOT AL	812	2952	150	25	662	2927	48	2	770	2950	4	0				

DISCUSSION

In the present study, overall seroprevalence has shown the dominance of HBV is 4.64% in comparison with HCV which was 1.32% and HBV+HCV is 0.10%. It is similar to the study done by D Lavanchy et al, and Praveen Malhotra et al in the year 2004 and 2020, 14, 15 respectively, where similar results were noted.

Among GEP 18.47% were HBV positive, 5.91% were HCV positive and 0.49% were HBV+HCV positive. In HBD 0.84% were HBV, 0.06% were HCV, and no positive of cases HBV+HCV. In terms of overall percentage, a high seropositive rate of HBV was found in

gastroenterology patients (GEP) (18.47%) in comparison with healthy blood donors (HBV) (0.84%) and a high seropositive rate of HCV (5.91%) was found in gastroenterology patients comparing to blood donors 16 0.06%.

In the GEP group of patients, 36.57% were males and 63.42% were females. Out of 36.57% of males, 13.17% are HBV, 4.18% are HCV, 0.36% are HBV+HCV and out of 63.42% of females, 5.49% were HBV, 1.72% were HCV, 0.12% were HBV+HCV positive.

In Healthy blood donors (HBV), 99.76% were male and 0.23% were females. In male patients 0.84% were HBV, 0.06% were HCV and no positive reports of both were observed.

The highest report of 27.97% in Gastroenterology patients (GEP) of the age group 31-40 years and 12.5% of Healthy blood donors (HBV) belong to the age group 51-60 years were reported in HBV patients. 14.13% of Gastroenterology patients of age group 51-60 years and 0.16% of Healthy blood donor (HBV) belong to the age group 21-30 years were reported in HCV patients.

Among various risk factors analyzed in the case of HCV-positive gastroenteritis, the majority were 75% of males in the Dialysis patients group and 35.47% of females were taking treatment for STDs. A 3.2% of healthcare workers were found among gastroenterology-screened patients who are at risk of exposure to HBV and HCV but all of them were vaccinated.

1.23% of truck drivers were found among screened gastroenterology patients and 0.49% were not vaccinated. Half of the screened patients of gastroenterology (59.48%) were vaccinated, 40.51% were not vaccinated, and among healthy blood donors (HBV) only one-third were vaccinated, the majority were not vaccinated (80.36%). 17

In this study, the risk factors for HBV identified were repeated blood transfusions, dental extractions, liver disease, jaundice, of which repeated blood transfusions and accounted for 6.39%. 47.97% of patients with these risk factors were positive for the Hepatitis B virus. The risk factors identified for HCV were repeated dialysis and organ transplants which accounted for 0.50% and 0.06% respectively, and patients with these risk factors were positive for the Hepatitis C virus. 18 The evidence of co-infection was observed in 4 patients of gastroenterology, three were males (0.36%) and one was female (0.12%) and the seroprevalence of co-infection was 0.49% which is very low and the risk factors identified for co-infection were repeated dialysis and liver disease and no vaccination.

CONCLUSION

It can be concluded that the male population is more sensitive to infection than the female population. Patients aged 21 to 30 years were more positive and there needs to be a healthy lifestyle modification. Patients who were undergoing treatment for STD were more in number, indicating that free or unprotected sex can lead to these infections instantly. The vaccination rate is not up to the mark except in a few occupations. If more campaigns are conducted to bring awareness to undergoing regular checkups, taking vaccination doses without fail, avoiding unprotected sex, etc. The prevalence of Hepatitis B and C viruses can be prevented.

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