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Prevalence of Hepatitis B, and C in a tertiary care Center of South India

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ABSTRACT

Aims. To estimate the prevalence of Hepatitis B, and Hepatitis C among the tertiary care population of South India.

Method. For this study, patients who had a positive diagnosis of hepatitis "B" or "C" at first were chosen, and demographic information, including age and gender, was gathered for additional analysis. The study duration was 13 months from January 2023 to February 2024.

Results. 838 patients were found positive for hepatitis B, and C, among them 612 (73%) were found positive for HBV, and 226 (27%) were found positive for HCV. Among the 612 HBV patients, males 429 (70.1%) were higher than females, and 41-60 years (n=200, 46.65%) age

groups were higher than other age groups. Among the 612 HBV patients, females were (n=183, 29.9%), and among them, 21-40 years (n=94, 51.4%) age groups were found higher than other age groups. Among the 226 HCV patients, males 188 (83.2%) were higher than females, and 21-40 years (n=102, 54.3%) age groups were higher than other age groups. Among the 226 HCV patients, females were (n=38, 16.8%), and among them, 41-60 years (n=20, 52.6%) age groups were found higher than other age groups.

Conclusion. Males were more likely than females to be infected and to have a positive diagnosis of hepatitis B and C. In the hepatitis B study, patients between the ages of 41 and 60 tended to be more male, whereas patients between the ages of 21 and 40 (reproductive age) tended to be more female. The distribution of patients in the hepatitis C study was reversed: more male patients were discovered in the age range of 21–40 years, while more female patients were identified in the age range of 41–60 years (reproductive age).

Keywords: Prevalence, Hepatitis B Virus (HBV), Hepatitis C Virus (HCV)

INTRODUCTION

Data from the World Health Organization (WHO) indicate that about one-third of people have a Hepatitis B Virus (HBV) infection. Over 257 million people worldwide suffer from CHB, and each year, nearly 1 million population die as a result of liver cirrhosis, and hepatocellular carcinoma (HCC). The majority of infections are contracted during infancy, early childhood, or as an adult, while less than 5% of immunocompetent adults have HBV. Africa, Asia, and several Central and Eastern European regions are home to the extremely endemic CHB strain, [1,2].

The authors estimate that 1.59 million people in the US have chronic HBV infection (1.25-2.49 million people), based on epidemiologic surveys and imputation studies [3]. A large number of studies have documented individuals infected with HBV, but very few have presented data in a fashion that makes treatment eligibility determination possible. While around ten percent of the 257 million individuals infected with HBV (26 million) may require immediate medical attention due to cirrhosis, a greater percentage (12–25%) can receive therapy in compliance with alternative protocols [4].

With 9.3% of the 0–4 age group of both genders saw the largest reduction in the Crude Incidence Rate (CIR). Infection rates decreased noticeably more quickly in the younger age group than in the oldest age group (80–84 years). The age group under 20 for both genders had the fastest drop in CIRs. Ages 25-39 years (RR 1.37) and 0–9 years (RR 0.52), respectively, had the highest and lowest incidence risks of AHBV infections. 2.63 times higher than the lowest risk is the highest danger. Especially, for both genders, the age-specific RRs were higher than 1 and were notably different for the age categories of 20–69 years and 20–64 years [5]. Recyclable garbage collectors 278 participated in a study, and among them 50.4% of them were women and 49.6% of them were men. The participants ranged in age from 18 to 70 (median age: 33) [6]. Consequences and co-infection of HBV infection are Hepatitis C (HCV), Hepatitis D (HDV), and HIV viruses [7,8]. In this research study, we will discuss HCV also along with HBV.

Globally, hepatitis C is a health concern that affects approximately 71·1 million people, or 1% (95% confidence interval: 0.8-1.1) of the total population, who are chronically infected. The most prevalent ways that HCV is spread are through intravenous drug use, hazardous injection practices used in healthcare settings, and direct blood exposure through blood transfusions. In 2015, there were 33.7 cases of HCV worldwide per 100,000 people (95% confidence interval: 21.3-28.7), and an estimated 175 million new cases of HCV infections were diagnosed. Serological indicators of prior or ongoing HCV infection are present in an estimated 2.3 million HIV-positive individuals. Globally, HCV genotypes 1 (44% of cases), 3 (25% of cases), and 4 (15% of cases) are the most frequently occurring infections. Over 20 to 30 years, between 10–20% of people with chronic HCV infection experience consequences such as cirrhosis, end-stage liver disease, and hepatocellular carcinoma [9].

Age ≤45 years and male gender were significant indicators for the occurrence of occult HCV infection (OCI) in research with equal numbers of male and female participants [10]. By 2030, very few nations will have successfully eradicated HCV. Since 80% of high-income nations are not on schedule to accomplish HCV elimination targets by 2030 and 67% are off target by at least 20 years, it is unlikely that these nations will achieve HCV eradication before 2050. Most low- and middle-income nations are still in the very early stages, regretfully, the latter group includes the nations with the highest rates of chronic HCV infections, including Pakistan, Egypt, China, and India [11].

Gender-specific treatment and prevention for patients with HBV-related liver disorders should receive more attention, as there are notable clinical disparities between male and female patients [12]. Males are mostly affected by HCC, with rates two to four times higher than in females. This is still the case for HBV-related HCC. The published research on gender inequality's function as a prognostic indicator as well as a risk factor for HBV-related HCC is examined below [13]. A statistically significant advantage in survival for females with HCC over males was found. but mostly neglected topics [14,15].

Even though the biology of HBV and the disease-related information have been extensively studied, many unknown immunologic and pathogenic, current or upcoming antivirals, elements, and approaches meant to reduce immunopathology or increase immunological responses are still uncertain [16]. As several unclear factors exist for HBV and HCV, the prime strategies can be first proper identification (diagnosis) of patients with HBV, and secondly prevention of the spread to other individuals. As not several studies published discussed age, gender, HBV, and HCV, the best knowledge of the processes governing HBV, and HCV clinical disparities in the age, and gender of patients positively diagnosed for HBV, and HCV will be extremely beneficial for the reduction of potentially fatal consequences for HBV, and HCV patients.

Ethical clearance

This study is carried out in the chosen study subjects with the agreement of the ethical committee and under the direction of a guide.

Conflicts-None

Funding-None

MATERIALS AND METHODS

Methodology

Study Setting, Design, and Duration

This observational study was conducted at Government Kilpauk Medical College & Hospital, Chennai, South India in inpatient and outpatient departments from January 2023 to February 2024.

Study Participants, Selection Criteria

838 patients with hepatitis "B", and "C" were selected to conduct this study after the selection criteria.

Inclusion criteria

- Patients positively diagnosed with hepatitis "B", and "C" are willing to provide consent.

Exclusion criteria

- Patients negative for hepatitis "B", and "C".

Study Procedure

The patients who were first initially diagnosed positively with hepatitis "B", and "C" were selected for this study, and their demographic details such as age and gender were collected for further analysis. This study was conducted for around 13 months.

Initial Diagnosis

Patients attending both inpatient departments and outpatient departments were clinically diagnosed with hepatitis B and C.

Hepatitis B

Hepatitis B is a viral infection that targets the liver. It can result in either acute or chronic illness. It is brought on by the Hepatitis B virus (HBV), which is spread by contacting an infected person's blood, semen, or other bodily fluids. This can occur during pregnancy, the early years of life, sexual activity, risky injections, or contact with sharp objects. The testing for hepatitis B was confirmed by HBsAg (ELIZA).

During acute or chronic HBV infection, high amounts of the protein HBsAg, which is present on the surface of HBV, can be seen in the serum. A person is contagious if they have HBsAg, with the possible exception within 30 days following a dosage of the Hepatitis B vaccination [17].

Hepatitis C

A viral illness that damages the liver is called hepatitis C. Both acute (short-term) and chronic (long-term) sickness may result from it. It may endanger your life. Contact with contaminated blood can result in the transmission of hepatitis C. The testing for hepatitis C was confirmed by an HCV antibody test (anti-HCV) (enzyme immunoassay (EIA) [18].

Data Collection, and Analysis

The 838 study patients' demographic details such as age, and gender, were observed, and documented as collected data. The collected data were further analyzed with demographic details such as age, and gender, and presented as tabular, and graphical presentations.

Statistical Analysis of Data:

The data analysis was done using SPSS software version 21. The data were expressed as frequencies and percentages. The data were compared for hepatitis B and C and presented as numbers and percentages.

RESULTS

Among the 838 study patients (n=612), 73% were diagnosed positively with hepatitis B, and 226 (27%) were diagnosed positively with hepatitis C. We found 2 (0.2%) patients were positive for both HBV and HCV. **Table 1** describes the salient characteristics of Hepatitis B study patients. Among the 612 hepatitis B patients, males were (n=429, 70.1%), and among them the patients with <20 years were (n=11, 2.6%), 21-40 years were (n=163, 38.0%), 41-60 years were (n=200, 46.65), 61-80 years were (n=53, 12.3%), and >81 years were (n=2, 0.5%). Among the 183 (29.9%) female Hepatitis B patients, among them the patients with <20 years were (n=4, 2.2%), 21-40 years were (n=94, 51.4%), 41-60 years were (n=71, 38.8%), 61-80 years were (n=14, 7.6%), and none were found in the age group of >81 years.

Table 1 Gender-Based Salient Characteristics of Hepatitis B Study Patients

Hepatitis B (n=612) (73%)	Categories	(n)	(%)	(n)	(%)
Gender	----------	Males (n=429)	70.1	Females (n=183)	29.9
Age (in years)	<20	11	2.6	4	2.2
	21-40	163	38.0	94	51.4
	41-60	200	46.6	71	38.8
	61-80	53	12.3	14	7.6
	>81	2	0.5	-----	00.0

Table 2 describes the salient characteristics of Hepatitis C study patients. Among the 226 Hepatitis C patients, males were (n=188, 83.2%), and among them the patients with <20 years were (n=27, 14.4%), 21-40 years were (n=102, 54.3%), 41-60 years were (n=51, 27.1), 61-80 years were (n=8, 4.2%), and, none were found in the age group of >81 years. Among the 38 (16.8%) female Hepatitis C patients, among them the patients with <20 years were (n=1, 2.6%), 21-40 years were (n=9, 23.7%), 41-60 years were (n=20, 52.6%), 61-80 years were (n=7, 18.5%), and 1 (100%) patient was found in the age group of >81 years.

Table 2 Gender-Based Salient Characteristics of Hepatitis C Study Patients

Hepatitis C (n=226) (27%)	Categories	(n)	(%)	(n)	(%)
Gender	----------	Males (n=188)	83.2	Females (n=38)	16.8
Age (in years)	<20	27	14.4	1	2.6
	21-40	102	54.3	9	23.7
	41-60	51	27.1	20	52.6
	61-80	8	4.2	7	18.5
	>81	---	00.0	1	2.6

DISCUSSION

This present study reported that the HBV-positive study patient's age distribution and also gender-wise age distribution, and was <20 years were 11 male patients, and 4 female patients, 21-40years were 163 male patients, and 94 female patients, 41-60 years 200 male patients, and 71 female patients, 61-80 years were 53 male patients, 14 female patients, and 2 male patients was found >81 years. Wong et al. retrospectively examined an epidemiological study that showed concomitant medical illnesses between 2004 and 2015 by analyzing a US healthcare claims database that included 121,568 matched controls and 44,026 patients with chronic HBV. The average age of HBV patients increased (P < 0.001), from 48.1 to 51.8 years for commercial/Medicare patients and 44.1 to 50.2 years for Medicaid patients [19].

This present study presented that the HCV-positive study patient's age distribution and also gender-wise age distribution, and was <20 years were 27 male patients, and 1 female patient, 21-40years were 102 male patients, and 9 female patients, 41-60 years were 51 male patients, and 20 female patients, 61-80 years were 8 male patients, 7 female patients, and 1 female patient was found >81 years. Zhang C et al reported in their study the age-wise distribution of study patients and not gender-wise age distribution, and the age groups were <20 years were 4, 21-30 years were 47 patients, 31-40 years were 37 patients, 41-50 years were 21, >51 years were 10 patients [20].

In the current study, 2 (0.2%) patients were infected with both HBV and HCV, whereas Lu MY et al reported that 4.9% of HBV carriers in endemic HBV infection countries, like Taiwan, also tested positive for anti-HCV antibodies, [21]. Our study reported 73% of HBV, and 27% of HCV patients, whereas Llovet JM et al, and Alberts CJ et al reported 21% of their HCV patients, and 56% of the HBV patients were linked to cirrhosis, and HCC [22,23].

CONCLUSION

The higher number of populations infected, and diagnosed positively for hepatitis, B, and C, were males than females. Among the hepatitis B study patients, a higher number of male patients were found in the age group of 41-60 years, whereas a higher number of female patients were found in the age group of 21-40 years (reproductive age). Among the hepatitis C study patients, it was vice versa, a higher number of male patients were found in the age group of 21-40 years, whereas a higher number of female patients were found in the age group of 41-60 years (reproductive age).

Males are more prone than females to be exposed to HBV, to develop a chronic infection, and to have consequences such as cirrhosis and hepatocellular carcinoma (HCC). Sexual dimorphism also plays a significant role in HBV infection. Likewise, HCV is also transmissible by exposure to infected shape objects, and as several healthcare workers who handle hospital biowaste are male members, hence male members require special attention in diagnosing for HBV, and HCV.

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