

Original research article

## Seroprevalence of Hepatitis B and Hepatitis C infection's in tertiary care hospital - Dahod, Gujarat

Jegan C<sup>1</sup>, Rekha Kishori<sup>2</sup>, Deepak W Deshkar<sup>3</sup>, Rukadikar AR<sup>4</sup>, Jignasha Tadvi<sup>5</sup>, Nitesh Kumar Jaiswal<sup>6</sup>, Shital Sangani<sup>7</sup>

<sup>1</sup> Tutor, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

<sup>2</sup> Assistant Professor, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

<sup>3</sup> Associate Professor, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

<sup>4</sup> Professor and Head, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

<sup>5</sup> Assistant Professor, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

<sup>6</sup> Assistant Professor, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

<sup>7</sup> Tutor, Department of Microbiology, Zydus Medical College and Hospital, Dahod, Gujarat, India

Corresponding Author: Atul R. Rukadikar

### Abstract

**Introduction:** The hepatitis B virus is the most common and important of the hepatitis viruses. HBV and HCV are transmitted through a variety of ways, including parenteral, sexual, and vertical transmission (Perinatal). Around 1.4 million people die each year as a result of viral hepatitis; HBV and HCV account for around 90% of these deaths, while other hepatitis viruses account for 10%. Despite the fact that viral hepatitis is a serious public health issue around the world, it has not been given the attention it deserves until now. Recently, the World Health Organization's "2030 Agenda for Sustainable Development Goals" outlined particular steps to avoid viral hepatitis.

### Aim & Objectives:

- To find out the seroprevalence of HBsAg and HCV in the Dahod area.
- To find the co-infection between HBsAg and HCV.
- To find out the pathogenic potential of HBsAg / HCV and Co-infections in rural populations

**Materials and Method:** Hospital-based cross-sectional study was conducted at Zydus Medical College and Hospital, Dahod, Gujarat, during the period of Jan 2020 – Dec 2020. The study group of patients was clinically diagnosed and admitted in various units such as Intensive care units (ICU) and health care units (wards). According to normal standards, 20,200 blood samples were collected and processed for HBsAg and 6250 blood samples were obtained and processed for HCV antibody testing using immunochromatographic (ICT) methods.

**Result:** On hospital-based cross-sectional analysis the year 2020, seroprevalence of HbsAg was 3.72% and HCV 0.54% which was lower in comparison to other parts of India where usually it has been reported. But, here none of the HbsAg and HCV co-infection detected.

**Conclusion:** The tribal area of the Dahod district shows a low seroprevalence of HBsAg and HCV. The availability of recent estimates of HBV, HCV, and associated co-infections, seroprevalence is required to evaluate control efforts and health-care planning, according to this study.

**Keywords:** Hepatitis B Virus (HBV), Hepatitis B Surface Antigen (HbsAg), and Hepatitis C Virus (HCV).

## Introduction

Hepatitis B virus (HBV) and hepatitis C virus (HCV) pose a significant worldwide health burden. HBV is thought to affect approximately 257 million people worldwide. Seventy-five percent of them are from Asia, with India accounting for over 50 million [1]. HCV has been claimed to impact an estimated 180 million people worldwide [2]. Chronic HCV infection affects around 13 million people in India [3]. Because HCV infection is asymptomatic, the vast majority of patients go undetected [4].

In dialysis patients, viral hepatitis has become one of the most common viral diseases. Patients undergoing hemodialysis (HD) are at an increased risk of contracting hepatitis B, hepatitis C, HIV, and other blood-borne viruses. Long-term vascular exposure and multiple blood transfusions, contaminated devices, equipment, and supplies, ambient surfaces, and attending people all play important roles in the nosocomial spread of these illnesses. Infections with HBV and HCV are the primary causes of morbidity and mortality in HD patients [5,6].

Patients with chronic kidney disease who are ready to begin dialysis should be tested for hepatitis B and C, as well as HIV infections. Because of the availability of an effective HBV vaccination, the prevalence of HBV is lower than that of HCV. The frequency of HCV infection among HD patients is substantial and varies between countries (1 percent –84.6 percent) and dialysis facilities within a single country. To avoid infections in dialysis patients, steps such as HBV vaccination before starting HD, isolating HBV- or HCV-infected patients, using special dialysis machines, and regular surveillance for HBV and HCV infection are all taken [7,8,9].

The heterogeneous group of hepatitis viruses varies taxonomically having one property common, that they are hepatotropic. Hepatitis B is a DNA virus, while Hepatitis C is an RNA one. Transmission of HBV and HCV occurs through multiple routes like parenteral, sexual, Vertical (Perinatal), and direct skin contact [10].

Each year, 1.4 million people die from viral hepatitis around the world. HBV and HCV are responsible for 90% of these fatalities [11,12]. Viral hepatitis is a major public health issue around the world, and the World Health Organization's "2030 Agenda for Sustainable Development Goals" has highlighted specific initiatives to avoid viral hepatitis [13,14].

Hepatitis B is one of the most common and serious infectious illnesses in the world, with high rates of morbidity and mortality [15]. HBV has infected around one-third of the world's population. Around 5% of these people are chronic carriers, and a quarter of them develop significant liver illnesses like chronic hepatitis, cirrhosis, and hepatocellular carcinoma. Every year, 780000 deaths due to HBV are reported over the world [16]. The age

of infection has an inverse relationship with the chance of having a chronic infection and subsequent consequences. If an infection arises during pregnancy, there is a 90% chance of acquiring a persistent illness and subsequent consequences [17].

Around 71 million people worldwide have chronic hepatitis C, putting them at risk of liver cirrhosis and cancer [18,19]. Approximately 3,99,000 deaths occur every year due to HCV infection [20].

In a recent 2017<sup>th</sup> WHO statement, In South-East Asia, 100 million people are currently estimated to be living with hepatitis B, and 30 million with hepatitis C. Viral hepatitis is a severe public health problem in India, with nearly 40 million people infected with hepatitis B and 6 to 12 million with hepatitis C[13].

The assessment and study of the disease's prevalence is critical for understanding its scale and transmission dynamics, as well as for its control and prevention. Given the seriousness of these diseases, the current investigation was conducted to investigate the prevalence of HBsAg and hepatitis C antibodies in our institute.

## MATERIALS AND METHODS

After receiving approval from the institutional review committee, a hospital-based cross-sectional study was conducted in the Virology Section of the Microbiology Department at Zydus Medical College and Hospital in Dahod, Gujarat. Clinically diagnosed and admitted patients from various units such as outpatient department (OPDs), intensive care units (ICUs), and health care units were included in the study group (wards). The research took time over the past a year, from January to December 2020.

According to the manufacturer's instructions, a total of 20,200 blood samples were collected and processed for HBsAg and 6250 blood samples were obtained and processed for HCV antibody testing using immunochromatographic (ICT) methods.

## RESULT

**Table 1: Overall Seropositivity of HBsAg and Anti-HCV antibodies**

Sr. No		HBsAg	Anti HCV positive
1	Positive	753 (3.72%)	34 (0.54%)
2	Negative	19447 (96.27%)	6216 (99.45%)
<b>Total</b>		<b>20,200</b>	<b>6250</b>

**Table 2: Age-wise Seropositivity of HBsAg and Anti-HCV antibodies**

Age groups	Total Tested	HBsAg positive	Total Tested	Anti HCV positive
Upto 10	477	7 (0.93%)	287	00
11 to 20	2715	92 (12.21%)	751	03 (08.82%)
21 to 30	9066	352 (46.74%)	1973	03 (08.82%)
31 to 40	2564	105 (13.94%)	1040	08 (23.52%)
41 to 50	1943	90 (11.95%)	876	07 (20.58%)
51 to 60	1752	60 (07.96%)	763	02 (05.88%)
61 and above	1683	47 (06.24%)	560	11 (32.35%)
<b>Total</b>	<b>20200</b>	<b>753</b>	<b>6250</b>	<b>34</b>

**Table 3: Gender-wise Seropositivity of HBsAg and Anti-HCV antibodies**

Sr.No	Gender	HBsAg Positive	HCV Positive
1	Male	324 (43.02%)	23 (67.64%)
2	Female	429 (56.97%)	11(32.35%)
<b>Total</b>		<b>753</b>	<b>34</b>

**Table 4: Month Wise Case distribution of HBsAg and Anti-HCV antibodies**

Month	HBsAg		Anti-HCV	
	Total	Positive	Total	Positive
<b>January</b>	2392 (11.84 %)	89 (11.82%)	638 (10.21%)	2 (5.88%)
<b>February</b>	2561 (12.68%)	88 (11.69 %)	862 (13.79%)	7 (20.59%)
<b>March</b>	1880 (9.31%)	66 (8.76%)	622 (9.95%)	0 (0.00%)
<b>April</b>	787 (3.90%)	29 (3.85%)	165 (2.64%)	1 (2.94%)
<b>May</b>	1294 (6.41 %)	49 (6.51%)	240 (3.84%)	2 (5.88%)
<b>June</b>	1637 (8.10%)	68 (9.03%)	341 (5.46%)	1 (2.94%)
<b>July</b>	1782 (8.82%)	44 (5.84%)	460 (7.36%)	1 (2.94%)
<b>August</b>	1202 (5.95%)	54 (7.17%)	394 (6.30%)	2 (5.88%)
<b>September</b>	1587 (7.86%)	60 (7.97%)	495 (7.92%)	1 (2.94%)
<b>October</b>	1649 (8.16%)	71 (9.43%)	661 (10.58%)	2 (5.88%)
<b>November</b>	1733 (8.58%)	75 (9.96%)	728 (11.65%)	8 (23.53%)
<b>December</b>	1696 (8.40 %)	60 (7.97%)	644 (10.30%)	7 (20.59%)
<b>Total</b>	<b>20200</b>	<b>753</b>	<b>6250</b>	<b>34</b>

In 2020, a total of 20,200 samples were collected from various wards and outdoor patients and analyzed for HbsAg (20,200) and HCV (6250).

HbsAg 753 (3.72%) and HCV 34 (0.54%) were revealed to be positive on rapid ICT (**Table 1**)

Tables 2 and 3 indicates the age ranges with females outnumbering males.

During this study period, HbsAg (Table.4) shows a high seropositive rate of 11.82 percent (89/2392) in January; February 11.69 percent (88/2561) respectively, and HCV shows a high seropositive rate of November 23.53 percent (8/728); February 20.59 percent (7/862); and December 20.59 percent (7/644). There was no evidence of HBV and HCV co-infection in any of the 20,200 samples tested.

## DISCUSSION

The current study focused on the seroprevalence of HBV, HCV, and co-infection among tertiary care hospital patients. A study of the prevalence of HBV and HCV infection is needed to better understand the disease's epidemiology and develop public health policies that can aid in disease prevention and control[20].

The prevalence of HBV in various populations has been found to range from 0.1% in developed countries to 20% in developing countries [22]. In our study, the overall prevalence of HBV was 3.73% (753/20200). In India, the average estimated carrier rate of HBV was 4% in 1995 [23]. A community-based study on HBV prevalence in urban and rural subjects in Tamil Nadu documented 5.7% of HbsAg positivity [24], which is comparable to our study report. In contrast, studies from West Bengal [25] and Kanpur [19] showed that 2.97% (227/7653) and 2.25% (450/20000) were positive for HbsAg, respectively and this is less than what was revealed in our study.

The geographical distribution of HCV varies greatly [26]. In our study, the overall prevalence of HCV was 0.54 percent (34/6250), which is significantly lower than findings from Bangladesh [27] and Tamil Nadu [28]. In India, relatively little study has been done on the prevalence of HCV in the general population. Community-based studies from West Bengal [29], Andhra Pradesh [30], and Arunachal Pradesh [31] showed the HCV prevalence of 0.87%, 1.4%, and 7.89% respectively, had a higher prevalence in comparison to our study.

In India, data on the general population prevalence of HBV or HCV are limited. In comparison with study reports from India, we have observed an overall higher prevalence of HCV and HBV infection.

## CONCLUSION

In the Dahod area, the current investigation found a low seroprevalence of HBsAg and HCV. Infection was more likely to strike middle-aged and younger people, particularly women. The availability of sufficient recent estimates of HBV or HCV prevalence is required to evaluate control approaches and health-care planning, according to this study.

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