

## AWARENESS OF HEPATITIS B INFECTION AMONG SECOND-YEAR UNDERGRADUATE MEDICAL STUDENTS AND THEIR VACCINATION STATUS

Venkateswarlu Ketha<sup>1</sup>, Prasanthi Kolli<sup>2</sup>, Ravi Kiran Koppolu<sup>3</sup>, Jyothi Pendyala<sup>4</sup>, Lokeshu Talapagala<sup>5</sup>, Gowriswararao Bootu<sup>6</sup>

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Corresponding Author:  
**Venkateswarlu Ketha,**  
Email: kethavenkat@gmail.com

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<sup>1</sup>Ph.D. Scholar, Department of Microbiology, Guntur Medical College, Guntur- 522004, Andhra Pradesh, India.

<sup>2</sup>Professor, Department of Microbiology, Siddhartha Medical College, Vijayawada - 520008, Andhra Pradesh, India.

<sup>3</sup>Assistant professor, Department of Microbiology, NIMRA Institute of Medical Sciences, Jupudi, Vijayawada- 521456, Andhra Pradesh, India.

<sup>4</sup>Assistant Professor, Department of Microbiology, Guntur Medical College, Guntur- 522004, Andhra Pradesh, India.

<sup>5</sup>Scientist-C, SLVRDL, Guntur Medical College, Guntur- 522004, Andhra Pradesh, India.

<sup>6</sup>Scientist-C, SLVRDL, Guntur Medical College, Guntur- 522004, Andhra Pradesh, India.

### Abstract

**Background:** Healthcare workers face an increased chance of encountering infections such as HIV, hepatitis B, and C. Among these, Hepatitis B poses the greatest risk and is highly infectious. Getting vaccinated is a crucial preventive step. This study aims to evaluate how well second-year medical students understand hepatitis B infection and whether they have been vaccinated. **Material & Methods:** We conducted a cross-sectional study using questionnaires among 210 second-year medical students at Guntur Medical College, Guntur, Andhra Pradesh. The questionnaire includes questions regarding hepatitis B infection, causative agents, mode of transmission, symptoms, carrier stage, screening, routes of administration of vaccine, treatment, and prevention. **Results:** Overall 210 students participated, of whom 99.5% had knowledge of causative agent. 205 (97.6%) were familiar with methods of transmission and symptoms in that order. 205 (97.6%) were informed about the carrier's condition. 204 (97.1%) agreed that Hepatitis B is preventable. 200 (95.2%) were aware of the route of administration of the vaccine. 175 (83.3%) knew the availability of antiviral therapy as a treatment. 180 (85.7%) were aware of screening for Hepatitis B infection. 130 (61.9%) were vaccinated, 27 (12.9%) students were incompletely vaccinated, 53 (25.2%) were not vaccinated. **Conclusion:** The findings of this study revealed that second-year medical students possess a commendable level of awareness about Hepatitis B infection, coupled with a vaccination rate of 61.9%. It is advisable to ensure vaccination for all students who have not received it yet, and concerted efforts should be made to enhance overall awareness.

## INTRODUCTION

Among the five hepatitis viruses (A-E), the one with the most pronounced societal impact is the hepatitis B virus which has caused more deaths worldwide per year than even the hepatitis C virus.<sup>[1]</sup> HBV is an enveloped virus with a size of 40-42 nanometers and belongs to the Hepadnaviridae family. Its genome is composed of circular, partially double-stranded DNA of 3.2 kilobases in length. Upon exposure, through the bloodstream the virus enters liver, establishing it as the primary site for HBV replication.<sup>[2]</sup>

Host immune response, virus replication, evolutionary dynamics, and environmental influences collectively contribute significantly to the pathogenicity of HBV infection. Conversely, for chronic HBV infection, the age of infection acquisition emerges as a notable determinant.

In 2019, the World Health Organization (WHO) noted that around 296 million individuals were affected by chronic hepatitis B infection, with an annual addition of 1.5 million new infections. During the same year (2019), hepatitis B led to approximately 820,000 fatalities, mainly attributed to cirrhosis and hepatocellular carcinoma.<sup>[3]</sup> According to the year

2021 National Family Health Survey carried out in India, the highest prevalence of Hepatitis B is observed in Andhra Pradesh and Telangana, followed by the states in the Northeastern region.<sup>[4]</sup>

HBV can be prevented by an exceptionally safe and effective vaccine, which is readily available and is the first anti-cancer vaccine.<sup>[5]</sup> Since HBV spreads through blood, healthcare workers are believed to face a 2 to 10 times greater risk of infection compared to the general population. According to a meta-analysis study, the occurrence of needle stick injuries among healthcare workers stands at 43%. The Centers for Disease Control and Prevention(CDC) advises healthcare workers to receive HBV vaccination due to their elevated of needle stick injuries and susceptible to HBV infection resulting from potential exposure to contaminated blood and bodily fluids.<sup>[6]</sup>

Around the world, an estimated 2 million healthcare workers are infected with HBV. In India, the prevalence of HBV infection among healthcare workers varies, with rates ranging from 10% in Bombay to 1% in Delhi. Incidence of HBV among healthcare workers can be attributed to a lack of knowledge about the virus, insufficient precautions, and failure to obtain the vaccination. To safeguard both themselves and the patients they care for, healthcare workers must possess adequate knowledge of the disease process and take appropriate measures to prevent infection transmission.<sup>[7]</sup>

This research aimed to evaluate the level of awareness regarding hepatitis B infection and vaccination status among second-year undergraduate medical students.

## MATERIALS AND METHODS

### Study Design and Population

During the year 2020, a cross-sectional study utilizing a questionnaire was executed among second-year medical students at Guntur medical college. The study spanned one month and received approval from Institutional Ethics Committee, participation was based on the voluntary willingness of students who were included in the study. A prior intimation letter was circulated to all the students to motivate for their active participation. Finally, a total 210 students enrolled for this study were received the questionnaire on HBV awareness.

### Data Collection

A semi-structured questionnaire comprising 10 questions was developed after a literature search and the opinion of experts were also considered while framing the questions to obtain sufficient

information. The questions were designed to obtain basic knowledge on HBV infection from the students. 10 questions were provided with options to choose from. The questions pertained to the understanding of causative agents and transmission methods of Hepatitis B infection, symptoms, carrier stage, screening tests, vaccine administration routes, vaccine uptake by the students and awareness about treatment and preventive measures.

The responses noted were double-checked for accuracy and were neatly arranged in the data sheet by using MS Office software.

**Table 1:**

Q.no	Questionary
1	<b>Causative agent?</b> a) Virus b) Bacteria
2	<b>Mode of Transmission</b> a) Sexual transmission b) Transfusion of contaminated blood c) Direct skin contact d) All the above
3	Symptoms? a) Vomiting b) Loss of appetite c) Jaundice d) All the above
4	<b>HBV affects liver function.</b> a) Yes b) No
5	<b>Carrier state?</b> a) Yes b) No
6	<b>Were you aware of screening tests for Hepatitis B infection?</b> a) Yes b) No
7	<b>Route of administration of vaccine?</b> a) Oral b) Intramuscular c) Intradermal d) Subcutaneous
8	<b>Hepatitis B vaccine uptake</b> a) Complete vaccination (3 doses) b) In Complete vaccination (1/2 doses) c) Not vaccinated (0)
9	<b>Treatment?</b> a) Antiviral therapy b) Immunotherapy c) Vaccination
10	<b>Preventable?</b> a) Yes b) No

### Statistical Analysis

The collected data was analysed using SPSS software. The descriptive analysis was performed, and the data is represented as frequency (n) and percentage (%).

## RESULTS

**Table 2: Responses on Knowledge about Hepatitis B Infection**

Knowledge about Hepatitis B infection	Frequency (n=210)	Percentage (%)
1. Causative agent?		

(a) Virus	209	99.5%
(b) Bacteria	01	0.5%
<b>2. Mode of Transmission?</b>		
(a) Sexual transmission	05	2.4%
(b) Transfusion of contaminated blood	200	95.2%
(c) Direct skin contact	01	0.5%
(d) All the above	04	1.9%
<b>3. Symptoms?</b>		
(a) Vomiting	01	0.5%
(b) Loss of appetite	02	1%
(c) Jaundice	13	6.2%
(d) All the above	194	92.4%
<b>4. HBV affects liver function?</b>		
(a) Yes	195	92.86%
(b) No	15	7.14%
<b>5. Carrier state?</b>		
(a) Yes	205	97.6%
(b) No	05	2.4%
<b>6. Were you aware of screening tests for Hepatitis B infection?</b>		
(a) Yes	180	85.7%
(b) No	30	14.3%
<b>7. Route of administration of vaccine?</b>		
(a) Oral	03	1.4%
(b) Intramuscular	200	95.2%
(c) Intradermal	06	2.9%
(d) Subcutaneous	01	0.5%
<b>8. Hepatitis B vaccine uptake</b>		
(a) Complete vaccination (3 doses)	130	61.9%
(b) Incomplete vaccination (1/2 dose)	27	12.9%
(c) Not vaccinated (0 doses)	53	25.2%
<b>9. Treatment?</b>		
(a) Antiviral therapy	175	83.3%
(b) Immunotherapy	10	4.8%
(c) Vaccination	25	11.9%
<b>10. Preventable?</b>		
(a) Yes	204	97.1%
(b) No	06	2.9%

## DISCUSSION

Healthcare workers face a major risk of getting infected with the hepatitis B virus. Even though the number of Hepatitis B cases has gone down a lot because of the Hepatitis B vaccine in the National Immunization Schedule making people more aware is important to bring it down even more. This is especially true for healthcare professionals.

In the present study, 99.5% of students were aware of the causative agent as a virus, whereas in a study done by Wadekar M et al. and Sharma S et al. 100% and 98.5% of students respectively, were aware of the causative agent for Hepatitis B infection.<sup>[8,9]</sup>

Coming to the modes of transmission of HBV, a good number of students (95.2%) knew that HBV transmits through contaminated blood. But the knowledge of sexual contact as route of transmission for HBV is very poor among the students with 2.4%, and 0.5% were with a false belief that HBV transmits through direct skin contact. A study done by Sannathimmappa MB et al reported that 81.1% medical students mentioned HBV occurs through contaminated blood.<sup>[10]</sup> Medical students should have precise knowledge of the methods of transmission so they can take precautions when working in clinical settings and raise awareness among other healthcare professionals and the public.

In the present study, 92.4% of the students have knowledge of symptoms of HBV infection either of vomiting or loss of appetite, or jaundice, even Wadekar M et al<sup>[11]</sup> reported 91.9%.

In the study group 92.86% of students knew that HBV affects the liver, which was 86.3% in a study done by Giri MR, et al.<sup>[12]</sup> It was observed that 97.6% of the students were aware of the carrier state of HBV and 85.7% of the students knew that screening tests are available for HBV. 61.9% of students had complete vaccination, 12.9% were incompletely vaccinated and 25% were non-vaccinated, Shrestha DB et al were stated in their study that 39.2% of the students were not fully vaccinated.<sup>[13]</sup>

Regarding the awareness on the route of administration of the HBV vaccine 95.2% students mentioned intramuscular, 2.9% mentioned Intradermal whereas 1.4% and 0.5% mentioned oral and subcutaneous route simultaneously.

In a study conducted by Paul P, et al it was stated that 93.5% students were aware that HBV infection is preventable.<sup>[14]</sup> In the present study 97.1% of students were aware of the preventive status of the HBV infection. Among the study group 83.3% of them have knowledge on antiviral treatment, 11.9% have on vaccination & 4.8% on immunotherapy. It was observed that 90% of students had a good understanding of HBV infection, how it spreads, and how to prevent it. However, there were still some

students who lacked enough knowledge among those who took part in the study.

The World Health Organization wants to get rid of viral hepatitis by 2030. But not knowing much about HBV infection could make it hard to research that goal.<sup>[15]</sup> Hence the present study provides information in understanding the gaps in the knowledge and awareness about hepatitis B infection among medical students and helps to initiate necessary measures in educating the students in the practical classes, this knowledge will help them to apply in their clinical postings.

## CONCLUSION

The study shows that starting health education programs in the first year of students' studies is really important. Learning about this disease early helps them understand it better and know how to be careful when treating patients. This knowledge helps them take the right steps to stay safe during their hands-on training. They can also pass on what they have learned to other healthcare workers and the public to spread awareness about hepatitis B.

Furthermore, it is suggested that the institution take the proposal to check the hepatitis B immunity status of students when they start their medical courses. Alongside this, regular vaccinations, and assessments of HBsAg antibody levels should be carried out, extending this approach from healthcare workers to medical students as well.

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