

Knowledge, Attitude and Practices towards Hepatitis B Infection and Vaccination among Medical Students**Pahune Vishal¹, Surve Rahul², Magare Anwaya³, Jadhav Vijaykumar⁴, Salve Shobha⁵**¹Junior Resident, Department of Community Medicine, MGM Medical College and Hospital, Aurangabad, Maharashtra²Associate Professor, Department of Community Medicine, MGM Medical College and Hospital, Aurangabad, Maharashtra³Associate Professor, Department of Community Medicine, MGM Medical College and Hospital, Aurangabad, Maharashtra⁴Professor, Department of Community Medicine, MGM Medical College and Hospital, Aurangabad, Maharashtra⁵Professor and HOD, Department of Community Medicine, MGM Medical College and Hospital, Aurangabad, Maharashtra

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Abstract

Rationale: The Hepatitis B virus is one of the most contagious blood-borne pathogens that can cause both acute and chronic liver disease. Use of contaminated needles for injections, blood transfusion, sexual contact, and vertical transmission from mother to fetus are the most common routes of transmission. About 10% of the patients develop chronic hepatitis and about 15% to 25% develop cirrhosis or liver cancer. Vaccination is the mainstay of prevention against hepatitis B infection with 90% to 100% protection conferred following complete vaccination. The present study was carried out to assess Knowledge, Attitude and Practice towards Hepatitis B infection and vaccination among medical students.

Methods: The present cross-sectional descriptive was conducted amongst 399 medical students, interns, and residents from July 2022 to August 2022.

Result: In the study, students showed sound knowledge regarding Hepatitis B, safe practices & attitude. More awareness is required about Hepatitis B vaccination in pregnancy & newborn care. In the present study, only 56.5 % of students were vaccinated and all the 3 doses were taken by only 23 % of students. 14.8 % cited that they do not know where to go & receive it. 10.8 % were not aware of the vaccination. Whereas, 36.6 % were incompletely vaccinated.

Conclusion: Participants had an overall sound knowledge regarding the structure of the virus, transmission, knowledge of complications and management. The majority of students were aware of safe practices and were following them. Initiating Hepatitis B campaigns to increase awareness of practice methods & vaccination drives would help increase practice levels and significantly reduce the incidence of Hepatitis B viral infections in the student community.

Keywords: Hepatitis, Vaccination, Contaminated, Needlestick, Recombinant.

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Introduction

Hepatitis B is a major public health problem as one-third of the world population is infected with hepatitis B virus (HBV). [1] Based on the prevalence of hepatitis B surface antigen (HBsAg), different areas of the world are classified as having high ($\geq 8\%$), intermediate (2%–7%), or low (<2%) HBV endemicity.[2] India is in the intermediate HBV endemicity zone (HBsAg prevalence among the general population ranges from 2% to 8%) with 50 million cases which makes it the second-largest global pool of chronic HBV infection. [3] Among

the health-care workers (HCWs), seroprevalence is two to four times higher than that of the general population. They remain at risk of acquiring HBV infection mainly through percutaneous or mucosal exposure to infected blood or body fluids.[4] India contributes to 25%-30% of the global injection load, as injections are overprescribed, often to satisfy the whims of the general population which thinks injections are more efficacious than oral route, and unsafe injection practices are common. A 2-year surveillance study from India even

reported that 59/255 (23.13%) of HCW had needlestick exposure. This high prevalence of infection transmission can be largely attributed to careless handling of infectious material, inadequate sterilization of medical equipment, and improper waste disposal.[5] The risk might be even greater if the HCW is a trainee, intern, or just a student as they have a lack of experience, insufficient training, or plain carelessness.[6]

Medical students are a group of healthcare workers (HCWs) who are at high risk of getting and spreading HBV because their activities involve contact with patients or blood or other body fluids in healthcare, laboratories, or public safety settings.[7] The risk varies during their career, but it is often the highest during their professional training. It was assumed that medical students studying in the College of Medicine are lacking important knowledge about and the appropriate practice toward infectious, occupational risks of HBV. Although many studies in different countries have been conducted, there have been very few attempts to evaluate the knowledge, attitudes and practices of undergraduates studying regarding occupational risks of HBV.[8] Therefore, this study had the objective of evaluating the knowledge base, attitudes, and practice of undergraduates regarding the occupational risks of HBV.

Material and Methods:

The present cross-sectional descriptive research design included 1st to 4th-year medical students, interns, and residents a total of 399 at Mahatma Gandhi Mission Medical College and Hospital, Aurangabad, Maharashtra a tertiary care institute.

Inclusion Criteria: Medical students (1st to 4th years, interns, and residents), both genders, willing to give consent.

Exclusion Criteria: None. The study was conducted from July 2022 to August 2022.

Study Tool: - The Pre-structured Questionnaire was used to collect the data. The present questionnaire was pre-tested during a pilot study that was conducted among 40 students. It was done to ensure clarity, and relevance, and determine the amount of time needed to answer all items. The results of the pre-test were evaluated critically, and some modifications were accordingly made. Results of a pilot study were not included in the final analysis. The knowledge grade was arranged between 0 – 12 depending on the responses they gave to the 12 questions regarding the knowledge of hepatitis infection and vaccination.

Data Collection: - Data was collected by personal interview.

Results:

Table 1: Distribution of students according to their knowledge about Hepatitis infection and Vaccination.

Sr. No	Question	Options	No. of Respondent	Percentage of Respondent	Correct Respondent	Percentage of Correct Respondent
1	Which part of the Hepatitis B virus is infectious?	Dane particles	211	53.7	211	53.7
		Spherical particles	100	25.4		
		Triangular particles	12	3.1		
		Tubular particles	70	17.8		
2	What criteria for labeling a person as a persistent carrier of hepatitis B infection is?	Core antibody in blood for > 6 months	19	4.8	231	58.8%
		Core antigen in blood for > 6 months	43	10.9		
		Surface antibody in blood for > 6 months	100	25.4		
		Surface antigen in blood for > 6 months	231	58.8		
3	What is occult HBV infection?	HBV DNA -ve and Anti HBc -ve	45	11.5	231	58.8%
		HBV DNA -ve and AntiHBc +ve	23	5.9		
		HBV DNA -ve and HbsAg +ve	94	23.9		
		HBV DNA +ve and HbsAg -ve	231	58.8		
4	What is the 5-year survival rate of hepatocellular car-	> 80 %	21	5.3	206	52.4%
		15 - 40 %	206	52.4		
		40 - 60 %	67	17.0		
		5 - 15 %	99	25.2		

	cinoma in patients of chronic hepatitis B infection?					
5	Which among the following drugs is used in the treatment for Hepatitis B infection?	Abacavir	17	4.3	273	69.5%
		Acyclovir	62	15.8		
		Corticosteroids	41	10.4		
		Tenofovir	273	69.5		
6	Which of the following is/are extrahepatic clinical feature(s) of Hepatitis B?	All the above	313	79.6	313	79.6%
		Arthritis	11	2.8		
		Membranous nephropathy	42	10.7		
		Polyarthritis nodosa (PAN)	27	6.9		

Sr. No	Question	Options	No. of Respondent	Percentage of Respondent	Correct Respondent	Percentage of Correct Respondent
7	What types of vaccine is Hepatitis B vaccine?	Inactivated or killed	43	10.9	270	68.7%
		Live attenuated	56	14.2		
		Recombinant vaccine - subunit vaccine	270	68.7		
		Toxoid vaccine	24	6.1		
8	Hepatitis B vaccine offers cross-protection against which other Hepatitis infection?	Hepatitis A	138	35.1	168	42.7%
		Hepatitis C	63	16.0		
		Hepatitis D	168	42.7		
		Hepatitis E	24	6.1		
9	Hepatitis B vaccine regime for adults is?	0, 1 month, 2 months	52	13.2	283	72.0%
		0, 1 week, 6 weeks	47	12.0		
		0, 1 month, 6 months	283	72.0		
		Cannot be given in adults	11	2.8		
10	If there is discontinuation in any of the vaccine doses, then when can the next doses be taken?	A soon as possible	226	57.5	226	57.5%
		Do not know	68	17.3		
		Need to restart the regime	69	17.6		
		Skip the remaining dose	30	7.6		
11	Does immunization of a mother during pregnancy protect the	No	128	32.6	265	67.5
		Yes	265	67.4		

	fetus against Hepatitis B?					
12	Who do you think is at high risk of Hepatitis B infection?	All the above	353	89.8	353	89.8
		Health care workers	18	4.6		
		Homosexual males	6	1.5		
		I.V. drug abusers	4	1.0		

Table no.1 shows that 211(53.7%) students knew that Dane particles of the Hepatitis B virus are infectious, 231 (58.8%) students rightly responded that surface antigen in blood for > 6 months is the criteria for labeling a person as a persistent carrier of hepatitis B infection and HBV DNA +ve and HbsAg -ve are the markers for occult Hep.B infection. Tenofovir is the drug used in the treatment for Hepatitis B infection was correctly mentioned by 273 (69.5%) students, while 313 (79.6%) students correctly said that

arthritis, membranous nephropathy, polyarthritis nodosa are the extrahepatic clinical feature(s) of Hepatitis B infection. 270 (68.7%) students correctly said that Hep.B vaccine is a recombinant subunit vaccine and 168 (42.7%) students knew that Hepatitis B vaccine offers cross-protection against Hepatitis D infection, 283 (72%) correctly mentioned the schedule of Hep. B Vaccination. 353(89.8%) students were aware that health care workers, Homosexual males and I.V. drug abusers are at high of Hep.B infection.

Table 2: Distribution of students according to Hepatitis B vaccination status (before/after entering medical college)?

Hepatitis B vaccination done	Frequency	Percent
No	171	43.5
Yes	222	56.5
Total	393	100.0

Table no.2 shows that 222(56.5%) students have received Hep.B vaccine before entering the course.

Table 3: Distribution of students according to the reasons for not taking vaccination.

Reasons of not taking Vaccination	Frequency	Percent
I do not know where to go and receive it	59	15.0
I am not aware of this vaccination	44	11.2
I am afraid of contacting the virus from vaccine	10	2.5
It is expensive	7	1.8
Not applicable	273	69.5
Total	393	100.0

Table no.3 shows the reasons why the students have not taken vaccination. In majority 59 (15%) students were not aware where the vaccine was available and when to take it, 44 (11.2%) students said that they were not at all aware that Hep.B was there, followed by 10 (2.5%) students were afraid of the vaccine.

Table 4: Distribution of students according to the use of gloves while handling body fluids.

Use of Gloves	Frequency	Percent
Always	361	91.9
Never	2	.5
Sometimes	30	7.6
Total	393	100.0

Table no.4 shows that majority 361 (91.9%) of the students always use gloves while handling the body fluids. While 30 (7.6%) students use it sometimes.

Table 5: Distribution of students according to the reporting of needle prick / sharp injuries.

Reporting of needle prick / sharp injuries	Frequency	Percent
Always	372	94.7
Never	19	4.8
Sometime	2	0.5
Total	393	100.0

Table no.5 shows that majority 314 (79.9%) students report if they or someone experience needle prick /sharp injuries. While, 44(11.2%) students report it sometimes.

Table 6: Distribution of students according to the grades of knowledge.

Grade	No. of Students	Percentage
Good (9 – 12)	134	34
Average (5 - 8)	179	46
Poor (0 – 4)	80	20
Total	393	100

Table no.6 shows that majority 134(34%) of the students had good knowledge and 80 (20%) students had poor knowledge infection and vaccination of Hepatitis B.

Discussion:

In the present study, 211(53.7%) students knew that Dane particles of the Hepatitis B virus are infectious, 231 (58.8%) students rightly responded that surface antigen in blood for > 6 months is the criteria for labelling a person as a persistent carrier of hepatitis B infection and HBV DNA +ve and HbsAg -ve are the markers for occult Hep. B infection. Tenofovir is the drug used in the treatment of Hepatitis B infection was correctly mentioned by 273 (69.5%) students, while 313 (79.6%) students correctly said that arthritis, membranous nephropathy, polyarthritis nodosa are the extrahepatic clinical feature(s) of Hepatitis B infection. 270 (68.7%) students correctly said that the Hep. B vaccine is a recombinant subunit vaccine and 168 (42.7%) students knew that the Hepatitis B vaccine offers cross-protection against Hepatitis D infection, 283 (72%) correctly mentioned the schedule of Hep. B Vaccination. 353(89.8%) students were aware that healthcare workers, Homosexual males and I.V. drug abusers are at the high of Hep. B infection.

Similarly, in a study by Nema S et al among the 150 HCWs they recruited, a significant difference in knowledge of HBV and its vaccination was observed. While consultants were best informed about the virus and the vaccine, awareness was generally poor among the housekeeping staff. Though majority of HCWs (62.67%) reported receiving all 3 doses of the HBV vaccine, documentation of the same was maintained by only 30.67% of the participants. The main reason for incomplete vaccination was the long-time gap between the doses (40%), while the main reason for not getting vaccinated was a lack of awareness about its need (28%). This study confirms our results. [9]

Also, in a study by Rathi A et al out of the 161 study participants, only 13 (8%) students had received a completed course of hepatitis B vaccination in the past, 30 (18.7%) students had a history of inability to complete the three doses of hepatitis B vaccination, and the rest 118 (73.3%) students were never immunized against hepatitis B. The knowledge about the risk of acquiring the

disease at the hospital or high-risk setting was present in less than half of the students. The average knowledge score was 10.63 out of 16 and the average healthy practice score was 2.94 out of 4. [6]

In the present study, 222(56.5%) students have received the Hep. B vaccine before entering the course.

Among the 26 (17.33%) non-vaccinated participants, the main reasons reported were either vaccination not required for prevention of HBV (n=9; 28%) or no idea about vaccination (n=8; 25%). Other reasons were unavailability of time for complete vaccination, no idea about HBV infection and fear of needles.

In a study by Thote SR et al majority of the students (>80%) had adequate knowledge of risk factors for HBV, its mode of transmission, and prevention. About 192 of 437 (43.9%) participants had a positive attitude towards following infection control guidelines, and 310 (70.9%) respondents believed that all HCWs should take the HBV vaccine. However, only 11.2% of students had completed the three-dose schedule of HBV vaccination. Whereas, a significant number of students, 142 (32.5%), had been exposed to blood/body fluid via needle stick injury at least once since they started their training in the health facility. These findings are close to our findings. [10]

In another study by Naqid IA et al among the respondents, only 96 (18.8%) were fully vaccinated against the Hepatitis B virus (received 3 or more doses of the vaccine), while 294 (57.5%) were not vaccinated. Lack of vaccination programs was the major reason for not receiving a vaccination (n = 182, 62%). About 286 (55.96%) of the participants had good knowledge, attitude, and practice on Hepatitis B, manifesting median scores of 26, 18, and 20, respectively. [11]

In the present study, 59 (15%) students were not aware where the vaccine was available and when to take it, 44 (11.2%) students said that they were not at all aware that Hep. B was there, followed by 10 (2.5%) students who were afraid of the vaccine.

In a study by Nema S et al, they found that the main reasons for incomplete vaccination reported were due to a long-time gap between the doses (n= 18; 60%) followed by unavailability of time for

complete vaccination (n=5; 16.6%). The awareness among the I MBBS students was noted to be the lowest (48%), with an improvement of knowledge of HBV vaccination among final MBBS students (93%). Hence, we need to address these hurdles of less vaccination. [9]

In a similar study conducted by Aaron D et al. common reasons for non-vaccination among HCWs were reported as they had not been offered a chance for HBV vaccination, they were very careful and observed standard precautions while at work and there was not enough awareness concerning access to HBV vaccination. This highlights the importance of not only HBV vaccination awareness among

HCWs but also repetitive emphasis on this matter. [12] In a study by Shrestha DB et al among the study participants, only 67 (37%) were fully vaccinated against Hepatitis B while 71 (39.2%) were never vaccinated. For the majority (74.6%) of the non-vaccinated participants, the main reason for not getting vaccinated was a lack of vaccination programs. Half the study participants (n = 92, 50.8%) had good knowledge, attitude, and practice regarding hepatitis B. [13]

Regarding the vaccination status of students for hepatitis B, 26.7% were fully vaccinated 36.4 % were partially vaccinated and 37% were unvaccinated. From the above studies by Nema S et al, Shrestha DB et al, and Hussain SF et al our study revealed the need to focus on IEC to increase vaccination. [14]

In the present study, all the participants were using new syringes for every new patient. In the present study, majority 361 (91.9%) of the students always use gloves while handling body fluids. While 30 (7.6%) students used it sometimes. In the present study, the majority of 314 (79.9%) students reported if they or someone experienced needle prick /sharp injuries. While 44(11.2%) students reported it sometimes.

There was a very strong agreement about needlestick 92.4% (85/92) and blood 87.0% (80/92) as efficient modes of HBV transmission. Seventy-two per cent of the participants did not have any knowledge about post-exposure prophylaxis for hepatitis B. Significant relationship was found between students who had a history of training about universal precautions and their appropriate actions after an accidental needlestick injury from a patient with known active HBV infection (50% vs. 20.9%; $P < 0.01$). [15]

In a study by Al-Hazmi AH about sixty percent (n = 319) of the respondents asked for a new syringe before injection. About half of the students (50.3%, n = 257) ask for ear/nose piercing sterilised

equipment. While 42.5% (n = 217) stated that they would report for needle prick/ sharp injuries. [11]

Conclusion

As per the study conducted, it is seen that participants had an overall sound knowledge regarding the structure of the virus, transmission, complications, and management. However, when compared to other surveys, they lacked some information regarding vaccination in pregnancy & breastfeeding. Regarding the attitude and practices, the vaccination status and practice levels among the students are not up to the mark. Most of the students were aware of safe practices and were following them. Initiating Hepatitis B vaccination to increase awareness of practice methods & vaccination drives would help increase practice levels and significantly reduce the incidence of Hepatitis B viral infections in the student community.

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References:

1. World Health Organization. World Health Organization Hepatitis B.htm. Geneva: World Health Organization. Available from: <http://www.whohepatitisB.htm>.
2. Puri P. Tackling the hepatitis B disease burden in India. *J Clin Exp Hepatol* 2014; 4:312-9.
3. Gupta S, Gupta R, Joshi YK, Singh S. Role of horizontal transmission in hepatitis B virus spread among household contacts in North India. *Inter virology* 2008; 51:7-13.
4. Hadler SC. Hepatitis B virus infection and health care workers. *Vaccine* 1990;8 Suppl 1: S24-8.
5. Taneja N, Biswal M. Safe disposal of infectious waste – Indian perspective. *J Hosp Infect* 2006; 62:525-7.
6. Rathi A, Kumar V, Majhi J, Jain S, Lal P, Singh S. Assessment of knowledge, attitude, and practices toward prevention of hepatitis B infection among medical students in a high-risk setting of a newly established medical institution. *J Lab Physicians* 2018; 10:374-9.
7. Singhal V, Bora D, Singh S. Hepatitis B in health care workers: Indian scenario. *J Lab Physicians* 2009; 1:41-8.
8. Oliveira LC, Pontes JP. Frequency of hepatitis B immunity and occupational exposures to body fluids among Brazilian medical students at a public university. *Rev Inst Med Trop Sao Paulo* 2010; 52:247-52.
9. Nema S, Saraf A, Ayer S, Singh A K, Biswas D. Awareness and vaccination status of Hepatitis B among health care workers in a tertiary care teaching hospital of Central India. *Indian Journal of Microbiology Research* 2021;8(2):152-156 153.

10. Subodh R. Thote, Gajanan C. Soyam, & Dhakate, M. A. (2023). Hepatitis B vaccination status and knowledge, attitude, and practice of hepatitis B among medical students at a medical college in central India. *International Journal of Community Medicine And Public Health*, 10(3), 1244–1249.
11. Naqid IA, Mosa AA, Ibrahim SV, Ibrahim NH, Hussein NR. Hepatitis B vaccination status and knowledge, attitude, and practice towards Hepatitis B virus among medical sciences students: A cross-sectional study. *PLoS One*. 2023 Nov 6;18(11):e0293822.
12. Aaron D, Nagu TJ, Rwegasha J, Komba E. Hepatitis B vaccination coverage among healthcare workers at national hospital in Tanzania: how much, who and why? *BMC Infect Dis*. 2017;17(1):786.
13. Shrestha DB, Khadka M, Khadka M, Subedi P, Pokharel S, Thapa BB (2020) Hepatitis B vaccination status and knowledge, attitude, and practice regarding Hepatitis B among preclinical medical students of a medical college in Nepal. *PLoS ONE* 15(11): e0242658.
14. Hussain SF, Ahmad SR, Muslehuddin OM, Muslehuddin HM. Knowledge, attitude and practice regarding hepatitis B among medical students. *Int J Community Med Public Health*. 2016 Nov;3(11):2977-2981.
15. Al-Hazmi AH. Knowledge, Attitudes, and Practice of Medical Students Regarding Occupational Risks of Hepatitis B Virus in College of Medicine, Aljouf University. *Annals of Medical and Health Sciences Research*. Jan-Feb 2015; 5(1): 13 – 19.