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Original Research Article

Hepatitis B vaccination status and knowledge, attitude, and practice of hepatitis B among medical students at a medical college in central India

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ABSTRACT

Background: Hepatitis B virus (HBV) infection imposes a major public health problem with an increased risk of occupational exposure among unvaccinated health care workers (HCWs). This study was conducted to determine the Hepatitis B vaccination status, along with the knowledge, attitude, and practice regarding Hepatitis B, among medical students at a medical college in a central India.
Methods: A cross-sectional study was conducted from February 2022 to July 2022. A total of 477 students of health care professions were included into the study using a whole sampling technique. Data were collected using self-administered structured questionnaire and analyzed by using statistical package for the social sciences (SPSS) version 26.
Results: Response rate was 91.61% (437). Majority of the students (>80%) had an adequate knowledge on risk factors for HBV, its mode of transmissions, and preventions. About 192 of 437 (43.9%) participants had positive attitude towards following infection control guidelines, and 310 (70.9%) respondents believe that all HCWs should take HBV vaccine. However, only 11.2% students had completed the three doses 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.
Conclusions: Study found that trainees in health profession are at a very high risk of contracting HBV infection during their training due to the low HBV vaccine uptake rate and high rate of accidental exposure to blood. We recommend that all students in the health profession should be vaccinated prior to their entry into professional practices.

Keywords: Hepatitis B, Students, Knowledge, Attitudes, Practice

INTRODUCTION

Hepatitis B is a major global health problem and potentially life-threatening liver infection caused by the hepatitis B virus (HBV). It increases the risk of death from cirrhosis and liver cancer.

According to World Health Organization, in 2015, 3.5% of the population, were living with chronic HBV infection and it is responsible for 1.34 million deaths worldwide. Most affected regions were the African and Western Pacific regions, accounted for 68% of those infected. It was also shown that the mortality from viral hepatitis increased by 22% since 2000.[1] In India, the prevalence of hepatitis B is estimated to be 3% to 4.2% with 40 million HBV carriers. It is estimated that every year about 115,000 Indians die due to complication related to hepatitis B.[2]

Hepatitis B is transmitted by contact with blood or body fluid of infected person. The main route of transmission is by mother to child at birth, unsafe injections, blood transfusion and unprotected sexual intercourse.[2]

HBV infection is an important occupational risk for a healthcare worker because their activity involves contact with patients or with blood or other body fluids from patients in a healthcare, laboratory, or public-safety setting. The risk of HBV infection is mainly attributed to the degree of contact with blood in the workplace and also to the hepatitis B-e antigen (HBeAg) status of the source person.[3] Healthcare workers include physicians, nurses, emergency medical personnel, dental professionals and students, medical and nursing students, laboratory technicians, pharmacists, hospital volunteers, and administrative staff.

A safe and effective vaccine is available that provides 98% to 100% protection against hepatitis B, preventing the development of complications, including chronic diseases and liver cancer. Hepatitis B vaccination provides protection to healthcare workers when administered early, ideally before occupational exposure, and also, provides greater protection for patients from infection through exposure to contaminated environments or infected workers.[4] According to WHO estimates, hepatitis B vaccination coverage among HCW's varies from 18% (Africa) to 77% (Australia and New Zealand).[5]

Medical students are important part of medical college, and they are at high risk of contracting hepatitis B. Hence, medical students were advised to have vaccination against HBV before coming to clinical side, as they acquire good immune response with immune memory. This study was conducted to determine the hepatitis B vaccination status, along with the knowledge, attitude, and practice regarding hepatitis B and associated risk factors among medical students of a medical college in a central India.

METHODS

A single centre cross-sectional study was conducted at the Shri Vasantrao Naik Government Medical College, Maharashtra in central India, in February 2022 to July 2022. The study targeted the second- to final-year medical (MBBS) students and interns at the medical college as clinical posting of medical students generally starts from second year.

The sample size for this study was determined by using the single population proportion formula by considering the following assumptions: The proportion of knowledge and practice on hepatitis B infection prevention was taken from the result of a previous similar study conducted by Sachidananda et al among medical students; from this study, the student who had good knowledge and good practice about hepatitis B infection prevention was 28.5% and 52.9%, respectively.[6] By taking the prevalence which gives the highest sample value population proportion, 52.9%, level of significance 5% (α=0.05), $Z_{\alpha/2}$=1.96, and margin of error 5% (d=0.05).

$$n = \frac{(Z_{\alpha/2})^2 \times P(1-P)}{d^2}$$

$$n = \frac{(1{\cdot}96)^2 \times 52{\cdot}9 \times 47.1}{(5)^2} = 398$$

Finally, a 20% nonresponse rate was added, and then, the total sample size required for this study appeared to be 477.

The study participants were selected by a random sampling technique considering the characteristics we are going to study uniformly distributed among the study population.

This study was conducted to assess the students' knowledge and awareness about hepatitis B and to assess the number of students covered by hepatitis B vaccine. All students were interviewed using a structured self-completed questionnaire. The questionnaire consisted of four sections: demographic and academic characteristics; knowledge regarding HBV transmission and prevention; attitude regarding HBV infection; and practices regarding HBV prevention.

Operational definitions

Good knowledge

Study participants who answer more than 70% knowledge questions correctly.

Poor knowledge

Study participants who answer less or equal to 70% of the knowledge questions correctly.

Good practice

Study participants who were able to answer more than 70% of practice item questions correctly.

Poor practice

Participants who were unable to answer less or equal to 70% of the practice item questions correctly.[7]

Data was coded, entered, and analyzed using the statistical package for social science (SPSS) version 22.0 (SPSS, Chicago, IL, USA).

Ethical approval of this study was received from the institutional ethical review board of the present medical college.

RESULTS

A total of 477 medical students were approached for this study while 437 medical students consented to participate in the survey; therefore, the response rate in our study was 91.61%.

The study was conducted among 437 MBBS students at a medical college. 25.63% students were intern, 25.41%

were in final year part-II, 24.94% were in final year part I and 24.02% were in second year. In this 62.47% were male and 37.53% were female. Students from urban areas were 60.86% and 39.14% students were from rural areas. Most of the candidates, 46.22%, were of the age 22-24 years (Table 1).

Table 1: Sociodemographic characteristics of study participants.

Characteristics	Frequency (%)
Gender	
Male	273 (62.47)
Female	164 (37.53)
Total	437 (100)
Residence	
Urban	266 (60.86)
Rural	171 (39.14)
Total	437 (100)
Year of study	
Second	105 (24.02)
Final part-I	109 (24.94)
Final part- II	111 (25.41)
Intern	112 (25.63)
Total	437 (100)
Age	
19-21	158 (36.16)
22-24	202 (46.22)
≥25	77 (17.62)
Total	437 (100)

In present study, more than half (53.55%) of medical students were not vaccinated against hepatitis B students who had taken one, two and three doses were 19.21%, 14.42% and 11.21% respectively (Table 2).

In this study, overall, 372 (85.13%%) of the study participants had good knowledge on hepatitis B infection, its mode of transmission and preventive measures. The mean knowledge score of the study participants was 8.61 (SD±1.09). Most of the students 385 (88.10%) knew that HBV can cause liver cancer. Most of students correctly identified blood and blood products (95.43%), injury with unsterilized needles and syringes (92.91%), and mother-to-child transmission (84.90%), open wound/cuts (89.02) as routes of hepatitis B virus transmission. However, most of the students 68.65% incorrectly identified that hepatitis B can be transmitted through casual contacts like handshaking (Table 3).

Table 2: Hepatitis B vaccination status among medical students.

Parameters	Frequency (%)
Vaccination against hepatitis B	
No	234 (53.55)
Yes	203 (46.45)
Doses of hepatitis B vaccine received	
No	234 (53.55)
One	84 (19.21)
Two	63 (14.42)
Three	49 (11.21)
More than three	7 (1.61)

Of the 437 participants, 385(88.10%) always change glove for each patient during blood collection and only 52 (11.90%) of the students did not use any gloves while handling different body fluids. Almost everyone uses new syringes for new patient. About 142 (32.49%) of the students had history of needle stick injury. Only 156 (35.70%) had screening test results for HBV infection. About 203 (46.45%) had been vaccinated with at least one dose of hepatitis B. Overall, there were unsatisfactory practical measures on prevention of hepatitis B infection among the study subjects (Table 4).

Regarding the attitude among the students towards hepatitis B, 45.08% agree that they are at risk of hepatitis B and 70.94% said that they believe in hepatitis B vaccine. Overall, 54.00% believed that changing of the gloves during blood collection and test is a waste of time. About 81.93% of the students agreed that all students should be tested for HBV before they enter in medical/paramedical/nursing education. About 43.94% of the students thinks that following infection control guideline will protect me from being infected with HBV at work (Table 5).

The univariate analysis showed that student's residence (OR=1.749, 95% CI=1.029–2.970) and age (OR=0.480, 95% CI=0.233–0.988) were significantly associated with good level of knowledge towards transmission and prevention of hepatitis B infection. However, none of the factors were significantly associated with the practice toward transmission and prevention of hepatitis B infections (Table 6).

Table 3: Knowledge of participants on hepatitis B virus infection prevention among medical students in medical college.

Variables	Yes (%)	No (%)
Can hepatitis B virus be transmitted by contaminated blood and blood products?	417 (95.43)	20 (4.57)
Can hepatitis B spread by casual contact such as hand shaking?	300 (68.65)	137 (31.35)
Can hepatitis B be transmitted from mother to child at the time of birth?	371 (84.90)	66 (15.10)
Can hepatitis B infection be spread through contact with open wounds/cuts?	389 (89.02)	48 (10.98)
Can hepatitis B be transmitted by unsterilized syringe, the needle?	406 (92.91)	31 (7.09)

Continued.

Variables	Yes (%)	No (%)
HBV carriers transmit the infection to other?	383 (87.64)	54 (12.36)
Can hepatitis B infection be spread through sexual contact?	367 (83.98)	70 (16.02)
Hepatitis B virus cause liver cancer	385 (88.10)	52 (11.90)
Can hepatitis B be cured or treated?	345 (78.95)	92 (21.05)
Can HBV vaccine prevent hepatitis B?	398 (91.07)	39 (8.93)
Good knowledge	372 (85.13)	65 (14.87)

Table 4: Practice of participants on hepatitis B infection prevention among medical students.

Variables	Yes (%)	No (%)
Have you screened for hepatitis?	156 (35.70)	281 (64.30)
Have you vaccinated against hepatitis B?	203 (46.45)	234 (53.55)
Do you use a new syringe for new patient?	437 (100)	0 (0)
Have you ever had a needle prick injury?	142 (32.49)	295 (67.51)
I always report a needle stick injury	200 (45.76)	237 (54.23)
I always change gloves for each patient during blood taking?	385 (88.10)	52 (11.90)
Good practice	122 (27.92)	315 (72.08))

Table 5: Attitude of participants on hepatitis B infection prevention among medical students.

Variable	Agree (%)	Disagree (%)	Not sure (%)
I am at risk for getting hepatitis B	197 (45.08)	153 (35.01)	87 (19.91)
I do believe in the hepatitis B vaccine	310 (70.94)	109 (24.94)	18 (4.12)
Changing of the gloves during blood collection and test is a waste of time	236 (54.00)	131 (29.98)	70 (16.02)
All students should be tested for HBV before they enter in medical/paramedical/nursing education	358 (81.93)	48 (10.98)	31 (7.09)
Following infection control guidelines will protect me from being infected with HBV at work	192 (43.94)	118 (27.00)	127 (29.06)

Table 6: Analysis of sociodemographic characteristics with knowledge and practice.

Variables	Knowledge		95% CI	OR	P value	Practice		95% CI	OR	P value
Gender	**Good**	**Poor**				**Good**	**Poor**			
Male	237	36	0.830-2.409	1.414	0.201	74	199	0.585-1.381	0.899	0.626
Female	135	29				48	116			
Total	372	65				122	315			
Residence										
Urban	234	32	1.029-2.970	1.749	0.037	79	187	0.815-1.941	1.258	0.300
Rural	138	33				43	128			
Total	372	65				122	315			
Age										
19–21	129	29	0.465-1.858	0.929	0.835	45	113	0.670-2.176	1.207	0.531
22–24	181	21	0.233-0.988	0.480	0.046	52	150	0.783-2.457	1.387	0.262
≥25	62	15	-	-	-	25	52	-	-	-
Total	372	65				122	315			
Academic year										
Second	91	14	0.426-1.999	0.923	0.839	30	75	0.663-2.115	1.184	0.568
Final part I	90	19	0.614-2.614	1.267	0.523	28	81	0.764-2.459	1.370	0.291
Final part II	95	16	0.478-2.137	1.011	0.978	28	83	0.783-2.517	1.404	0.254
Interns	96	16	-	-	-	36	76	-	-	-
Total	372	65				122	315			

DISCUSSION

In present study, 53.55% medical students were vaccinated against hepatitis B. Among these vaccinated students, 147 (72.41%) had taken less than three doses and 27.59% had more than three doses of hepatitis B. A study conducted in Nepal showed that 60.8% medical students were vaccinated against hepatitis B.[8] In another study at Nigeria showed that 85.4% medical students were vaccinated against hepatitis B.[9]

In the current study, 85.13% of participants had good knowledge of hepatitis B virus infection prevention. In study conducted at Ethiopia, good knowledge about hepatitis B infection were found in 60.60% participants.[10] In other study conducted at Zambia, 91.4% of participants had good knowledge of hepatitis B infection.[11]

In our study 95.43% said hepatitis B is transmitted by blood and 83.98% said it is transmitted by sexual contact. Similar findings were reported by study conducted by Jayakiruthiga et al, in which 92.5% had knowledge that hepatitis B is transmitted by blood and 91% said that it is transmitted by sexual contact.[12] In other study conducted at Hyderabad showed that 98.8% students had knowledge that hepatitis B is transmitted by blood and 94.4% had knowledge that it is transmitted by sexual contact.[13] Also, study conducted at Ethiopia, Madhya Pradesh (India), Rajasthan (India) showed similar results.[6,7,14,15] This is contrast to study conducted in Nigeria where only 37% student believe that hepatitis B is transmitted by unsafe sex.[16] In present study 91.07% students had knowledge that hepatitis B vaccine can prevent hepatitis B infection and 88.10% thinks that hepatitis B infection can cause live cancer. Similar results were obtained in a study conducted in Rajasthan by Baig where 99.4% students said that vaccination can prevent hepatitis B infection.[15] Similar findings reported in other studies.[6,17,18]

Our study revealed that 72.08% of the study participants had unsafe practice towards hepatitis B and C, despite their good knowledge regarding this life-treating disease, its mode of transmission and prevention measures. Safety practices among the study participants were poor, with only 35.70% of them had screened themselves for this disease. About 32.49% had history of needle stick injury. This was almost equal to the 33.5% and 26.1% needle stick injury reported among medical students of Karachi medical colleges/universities in Pakistan and 24.6% among Ghana University medical students.[19-21] But, it was higher than 7% reported among medical students of Hyderabad in India, and higher than 27% reported among medicine and health sciences students in Northwest Ethiopia.[13,22] The high prevalence of needle stick injury in the presence of good knowledge regarding preventive measures in our study indicates that not the knowledge alone is sufficient but the implementation of the acquired knowledge that will prevent the health professional students from the risk of needle stick injuries.

Although reporting of exposure to needle stick injury is important to ensure appropriate counselling and treatment of the students, up to 54.24% of our respondents who experienced needle stick injury did not report the incidence. Failure to report needle stick injury was also recorded for 46.8% of students at the Wollo University, North East Ethiopia and 70.3% of medical students at university teaching hospital of Karachi, Pakistan.[7,20] Not reporting of such injuries represents a missed opportunity for initiating postexposure prophylaxis, early detection of seroconversion and implementation of prevention strategies. Regarding screening test, only 35.70% of the students in this study had screening test result for HBV. A study conducted in Senegal also found that more than half of the students (55.6%) had screened for hepatitis B.

In present study, factors associated not only with good knowledge but also with attitudes and practices were studied. Of the 437 students, 85.13% had good knowledge of hepatitis B and only one third (27.92%) of students had good attitudes and practices regarding hepatitis B. We found significant association between residence (OR=1.749, 95% CI=1.029–2.970) and age of students (OR=0.480, 95% CI=0.233–0.988) with the level of knowledge. We were unable to find a link between gender, age, marital status, and level of practice. Similarly, Demsiss found significant association between residence (p=0.048) and level of knowledge.[7]

In contrast, Gebremeskel does not find any association between residence, age of students but academic year of students was found to be associated with the level of knowledge (AOR=8.0, 95% CI=2.57–24.8)).[14] Also, in study conducted by Deguenonvo found significant association between academic year (AOR=2.4, 95% CI=1.1–5.4)) and age of students (AOR=1.9, 95% CI=1.1–3.6) and the attitude of students toward hepatitis B.[23] Training should be given regarding the transmission and prevention of HBV and HCV with special attention to needle stick injury and post-exposure prophylaxis before every clinical posting.

Limitations

There are few limitations of this study. Present study covers medical students only so caution should be taken while generalizing the results. Secondly, because our study was cross-sectional in nature, temporal association cannot be established.

CONCLUSION

In present study, 46.45% medical students were vaccinated against hepatitis B. Present study showed that, more than half of the students have good knowledge of hepatitis B infection prevention; however, most of the students have poor practice about infection prevention on HBV. Residence and age of students are factors for knowledge of the students towards infection prevention of HBV.

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