

Knowledge and awareness regarding hepatitis B among preclinical medical and dental students of Chitwan Medical College Nepal: a questionnaire-based study

Dev Kumar Shah¹, Rajesh Kumar Jha², Shamshul Ansari³, Phoolgen Sah², Govinda Prasad Dhungana⁴, Sangharshila Basnet²

¹Department of Physiology, Chitwan Medical College, Bharatpur, Nepal.

²Department of Pharmacology, Chitwan Medical College, Bharatpur, Nepal.

³Department of Microbiology, Chitwan Medical College, Bharatpur, Nepal.

⁴School of Public Health and Community Medicine, Chitwan Medical College, Bharatpur, Nepal.

Correspondence to: Dev Kumar Shah, E-mail: devshahdr@yahoo.com

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Abstract

Background: The knowledge of students regarding hepatitis B virus (HBV) before attending clinical years, when their daily activities will be closely related to patients' body fluids, plays vital role in minimizing the risk of acquiring HBV infection.

Objective: We aimed to assess the knowledge regarding HBV infection, its mode of transmission, and prevention among preclinical medical and dental students.

Materials and Methods: A descriptive cross-sectional study was conducted using a structured self-administered questionnaire among the students of Chitwan Medical College, Nepal. A descriptive statistics along with Z ratio was used to analyze the obtained data.

Results: Among 313 completely filled questionnaires, respondents gave 87% correct answers regarding the knowledge of HBV infection and 89.6% on its preventive aspect. However, only 73.5% participants were vaccinated for HBV. The blood and blood products (50%) followed by sexual contact (31%) were common mode of transmission reported. Compared to first year, significantly better knowledge was found among second year medical students regarding the infectious/transmissible nature of hepatitis B disease ($p = 0.004$), its causative agent ($p = 0.004$), and mandatory screening for HBV of blood donor before transfusion ($p = 0.02$).

Conclusion: The students had good knowledge regarding HBV infection and its preventive aspect. All students should be mandatorily vaccinated before attending the clinical years.

KEY WORDS: Infection, transmission, prevention, vaccination

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Introduction

Transmission of hepatitis-B virus (HBV) infection by blood transfusion and other medical interventions is common in countries such as Nepal, India, and other South-East Asia Region (SEAR).^[1] Health-care workers have been reported to have the highest occupational risk of HBV infection during their health professional training and the incidence of this infection

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among them has been estimated to be 2–4 times the level in the general population.^[2,3] As part of occupational safety measures, all health-care workers are required to be vaccinated against HBV.^[4,5] The risk of infection by HBV ranges from 6% to 30%, if no prophylactic measure is adopted; however, a combination of vaccines and gamma globulin can reduce this risk by 90%–95%.^[6] Unfortunately, the World Health Organization has estimated that HBV vaccination coverage among health-care workers is only 18%–39% in low- and middle-income countries compared to 67%–79% in high-income countries.^[2] The survey conducted on vaccination status against HBV among medical students in B.P. Koirala Institute of Health Sciences (BPKIHS), Nepal, and among students of seven medical colleges of Karachi, Pakistan, have shown 86.5% and 79% of the students vaccinated, respectively.^[7,8] However, a study conducted among 111 medical students of Cameroon showed only 18% participants had completed the three doses of primary HBV vaccination.^[9]

The knowledge regarding hepatitis B and its related safety precautions is essential to minimize the acquired infections in health-care settings among health personnel, especially medical and dental students who are more vulnerable to HBV infection as they remain in direct contact with the infected patients, blood, injections, and surgical instruments during the course of clinical work.^[10,11] Noubiap *et al.* have found a good knowledge of the risk factors for HBV infection and awareness of HBV vaccine among medical students of clinical years in Cameroon.^[9] Similarly, a study among medical students at Syrian Private University revealed the weakness of general knowledge about hepatitis B among junior medical students compared to those in the fifth year.^[12] In Nepal, overall good knowledge was found among nursing students of five different colleges in Kathmandu.^[13]

However, the literature search did not reveal any study regarding the assessment of knowledge about hepatitis B among preclinical medical and dental students in Nepal. Therefore, this study sought to assess the knowledge regarding HBV infection, its mode of transmission and prevention among first and second year (preclinical) medical and dental students of Chitwan Medical College, Nepal. The assessment of knowledge of these students before they get exposed to more vulnerable environment in clinical years may also provide a point of reference to the academicians so that necessary corrective strategies can be planned and adopted on time to enhance their level of knowledge and awareness regarding HBV, if necessary.

Materials and Methods

This cross-sectional, descriptive, institutional-based study was conducted among medical and dental students of 1st and 2nd year of Chitwan Medical College (CMC), Bharatpur, Nepal. The study subjects were fully informed about the design and purpose of the study. Verbal informed consent was obtained from each participant, and anonymity of the participants was maintained throughout the study. Approval for this study was

obtained from Institutional Review Committee of CMC (CMC-IRC). The study was carried for 1 month during September 1–30, 2015, in accordance with the Declaration of Helsinki.

Data Collection

We used a structured pretested questionnaire containing 10 closed-ended (yes/no) and 8 open-ended questions. The questionnaire also included demographic and academic characteristics of participants along with 18 questions testing the knowledge regarding HBV infection and its mode of transmission; a section on prevention of HBV infection including vaccination and screening status of the participants and their family members; and source of information. The printed copies of questionnaire were self-administered to 365 students of first- and second-year of bachelor in medicine and bachelor of surgery (MBBS) and bachelor of dental surgery (BDS) program at the end of lecture session and asked them to fill at their will and convenience. The following day, participants returned those questionnaires anonymously to the researchers.

For the evaluation of general knowledge of the risk factors for HBV infection and HBV vaccine, we calculated the mean percentage of correct answers for all the questions on the risk factors and the HBV vaccine. Their knowledge was considered “good” if the mean percentage of correct answers was equal or greater than 75%, “fair” if it was less than 75% and equal or greater than 50%, and “poor” if it was less than 50%.

Statistical Analysis

Data were coded, entered, and analyzed using the Statistical Package for Social Science (SPSS) version 20.0 for Windows (SPSS, Chicago, IL, USA). We described continuous variables using means with standard deviations, and categorical variables using their frequencies and percentages. The z-ratio was used for the significance of the difference between two independent proportions and a *p* value less than 0.05 was considered statistically significant.

Results

A total of 365 students of Chitwan Medical College (CMC) voluntarily participated in the study. Among them, 319 students returned the questionnaire (response rate, 87.3%). However, only 313 questionnaires were completely filled and considered for analysis among which first- and second-year MBBS students were 113 and 119 and first- and second-year BDS students were 36 and 45, respectively. Their ages ranged 18–25 years with a mean age of 20.13 ± 1.1 years. Male and female responders were 171 and 142, respectively.

Data regarding the knowledge of HBV infection and preventive measures among participants are shown in Table 1. The result revealed a good knowledge (87% of correct answers) regarding HBV infection (reflected by the first six statements in this table) among participants except about the curable nature of the disease. In fact, only 40.9% of participants gave the correct answer denying the statement

Table 1: Knowledge about hepatitis B infection and preventive measures among 313 students in CMC

Statements	Correct answers N (%)
Is hepatitis B an infectious/transmissible disease?	279 (89.1)
Causative agent for hepatitis B-	293 (93.6)
Hepatitis B affects which organ-	303 (96.8)
Should all patients undergoing surgeries be investigated for HBV?	214 (68.4)
Is screening of blood donors for HBV mandatory for safe transfusion?	273 (87.2)
Can hepatitis B patients be completely cured by drugs?	128 (40.9)
Is hepatitis B infection a preventable disease?	279 (89.1)
Measures to prevent hepatitis B-	282 (90.1)
Is there hepatitis B vaccination available?	303 (96.8)
The minimum number of doses for a complete primary HBV vaccination-	259 (82.7)

“HBV patients can be completely cured.” Responses of last four statements that reflect the knowledge on the preventive aspect of the disease also showed that the participants had a good knowledge (89.6% of correct answers) on this matter.

When we compared the knowledge between first- and second-year MBBS students, the significant differences were observed on the first, second, and fifth statements as shown in Table 2. On comparison between first- and second-year dental students, significant differences were noticed on the first and seventh statements. However, no significant difference was observed between first- and second-year students of both stream (medical and dental) when the aggregate knowledge regarding HBV infection (reflected by the combination of first six statements) and preventive aspect of this disease (reflected by the combination of last four statements) were compared.

In our study, 73.5% participants were vaccinated for hepatitis B infection while 4.5% did not know their vaccination status. Similarly, 41.9% participants had undergone screening for hepatitis B while again 4.5% were not confirmed about their screening. Surprisingly, 22% participants reported that none of their family members were vaccinated and 16% did not know whether any of their family members were vaccinated or not for HBV. Twenty-three out of 313 participants accepted that hepatitis B infected person(s) is/are in their family. Almost same number of respondents (132 vs 136) was in favor and against the isolation of hepatitis B–infected person. When the participants were asked about their knowledge regarding universal precautions, 198 out of 313 reported that they are being educated on this matter, 60 students said that they have heard something like that; however, surprisingly, 55 students did not know anything about it.

Blood and blood products (50%) followed by sexual contact (31%), from mother to child during delivery (7%), and others were reported as the common modes of transmission of HBV (Figure 1). Television, newspaper/magazine, and health-care provider were some of the major sources of knowledge about hepatitis B among the participants (Figure 2).

Discussion

Studies have reported highest occupational risk of HBV infection during health professional training.^[2] In this study, we describe the knowledge regarding HBV infection, its mode of transmission, and prevention among medical and dental students of first and second year (preclinical years) of study before they come in contact with the patients in hospital in their clinical years. We also studied the vaccination and screening status of the participants and their family members along with their source of information for HBV infection. We found good knowledge regarding the HBV infection among the participants except on the curable issue of the disease in which majority of them said that HBV infection can be completely cured. Inability to achieve a complete cure of chronic HBV infections still remains a major problem.^[14] The significant difference was found among second-year medical students compared to first-year students regarding knowledge on the infectious/transmissible nature of hepatitis B, its causative agent, and mandatory screening of blood donor for HBV before transfusion. As details of different aspects of this disease are learned in the second year of medical curriculum, this might have been reflected in their responses.

The knowledge on the preventive aspect of HBV also showed that the participants had a good knowledge on this matter. As the evidence of HBV transmission to and from health-care workers is very high, vaccination is the most important way to prevent hepatitis B diseases other than following strict hygiene with all invasive procedures and a considerate lifestyle.^[14] We found that 73.5% study participants were vaccinated for hepatitis B infection while 4.5% did not know their vaccination status. Studies have shown that awareness of risk among health-care workers is an important factor affecting HBV vaccine uptake.^[15,16] The HBV vaccine uptake among our participants did not exactly match with their good knowledge level of HBV infection. The HBV vaccination uptake in our study population is slightly lower than those found among medical students BPKIHS, another medical institute of Nepal, and among medical students of Pakistan.^[7,8] The reasons for nonvaccination of all the students needs to be explored and regular vaccination program at minimal cost should be started along with their motivation. We also found low screening status (41.9%) among the participants. In addition, low level of awareness about the vaccination and screening status of own family members among medical students should be taken seriously and its importance needs to be highlighted. Moreover, they might be a role model for their society in this regard.

Table 2: Comparison of knowledge and awareness about hepatitis B infection among MBBS and BDS students of CMC

Statements	Correct responses (%)				p value			
	MBBS I (N=113)	MBBS II (N=119)	BDS I (N=36)	BDS II (N=45)	p1	p2	p3	p4
Stat 1	87.5	95	73.7	90.9	0.04	0.04		
Stat 2	89.3	98.3	92.1	93.2	0.004	0.83		
Stat 3	96.4	98.3	97.4	93.2	0.37	0.11		
Stat 4	66.1	64.7	81.6	72.7	0.78	0.28	0.39	0.84
Stat 5	79.5	89.9	94.7	93.2	0.02	0.83		
Stat 6	42.9	41.2	36.8	38.6	0.73	0.91		
Stat 7	84.8	91.6	84.2	97.7	0.11	0.04		
Stat 8	86.6	93.3	86.8	93.2	0.09	0.47		
Stat 9	95.5	98.3	97.4	95.5	0.22	0.69	0.30	1
Stat 10	83.9	87.4	81.6	68.2	0.46	0.13		

$p < 0.05$, considered statistical significant; p value by Z ratio; p1 and p3= MBBS I vs. MBBS II; p2 and p4= BDS I vs. BDS II

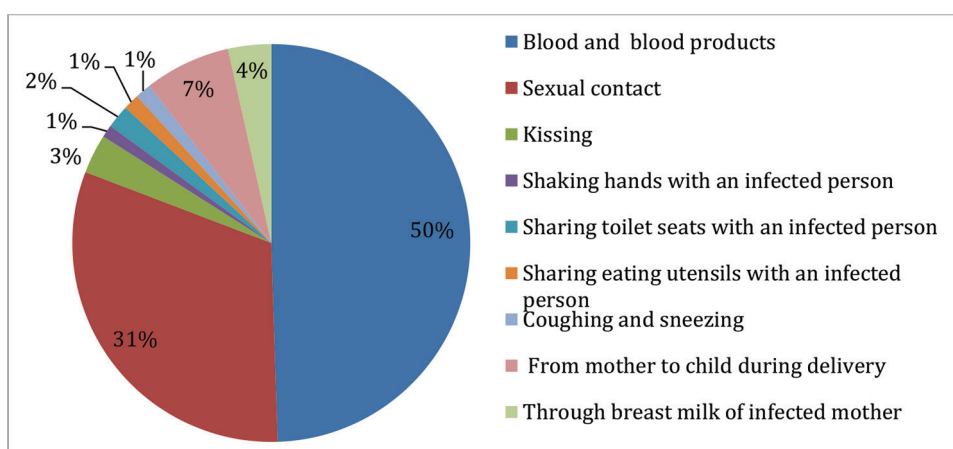


Figure 1: Knowledge of modes of HBV transmission among MBBS and BDS students of CMC.

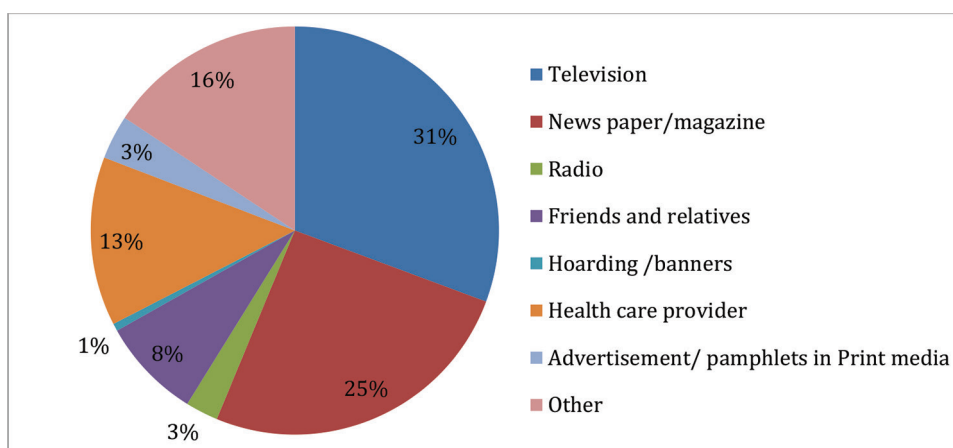


Figure 2: Source of knowledge about hepatitis B among MBBS and BDS students of CMC.

HBV is transmitted by percutaneous and mucosal exposure to infectious blood or body fluids.^[17] HBV is not spread by breastfeeding, kissing, hugging, coughing, ingesting food or water, sharing eating utensils or drinking glasses, or by casual contact in the workplace.^[18] Blood and blood products, sexual contact, from mother to child during delivery, kissing and few other modes of transmission of HBV were reported by our participants. Shaking hands, hugging, sharing eating utensils and food, coughing and sneezing were not believed by respondents as the source of transmission of disease. Besides knowing possible source of transmission, it is important to remember that HBV remains viable and infectious in the environment for at least 7 days and can be present in high concentrations on inanimate objects, even in the absence of visible blood.^[19,20]

We found that the participants were almost equally divided for and against the issue of isolation of HBV-infected person. In contradiction, Khan *et al.* found that about three-fourths of the medical students of Karachi correctly indicated that these patients should be allowed to work routinely and should not be isolated.^[9] According to infection control policy for viral hepatitis infection approved by Cardiff and Vale NHS Trust Board, isolation is not usually required; however, if there is likely to be uncontrolled bleeding and/or splashing with other body fluids which could contaminate the environment, then isolation of HBV-infected patient in a single room is recommended.^[21]

Majority of our participants reported that they were being educated regarding universal precautions while 17.5% admitted of being unknown about it. Ramakrishnan *et al.* found a significant difference between the academic years on the level of knowledge about universal precaution.^[22] We found some additional efforts are needed to teach and emphasize the students regarding universal precautions to handle the needles or cutting objects, and to protect them against secretions so that the risk of preventable infections could be minimized.

The most potential source of cumulating the information regarding HBV among the participants was found to be television followed by newspaper/magazine, health-care providers, friends/relatives, and others. Similar study done among nursing students of different colleges in Kathmandu also revealed that radio/television followed by poster/booklets, newspaper, teachers, and friends were the sources of information for the participants.^[13] The availability of resources and place influence the source of information that prominently affects the knowledge on respective matter. These common tools can also be used to fill any gaps in the knowledge and practice of universal precautions among upcoming physicians and surgeons in our and similar settings.

It is the responsibility of the academicians to ensure that their preclinical students have ample knowledge regarding this transmissible disease before they come in contact with patient's blood, other body fluids, and different medical/surgical intervention in clinical years so that occupational risk can be minimized. The vaccination program against HBV should be conducted to cover all the students before the start of their clinical years. We would like to recommend the arrangement for compulsorily screening and vaccination of students for

HBV at the time of admission by the institute management to reduce the future occupational risk.

Conclusion

Overall, good knowledge revealed by this study among medical and dental preclinical students regarding hepatitis B can be utilized effectively to motivate the students for vaccination against HBV and adaptation of different safety precautionary measures to reduce the occupational risk in future. Longitudinal study is needed to observe the actual improvement in knowledge regarding HBV after an academic year among students, which is the limitation of our study.

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References

1. World Health Organization. Health situation in the South-East Asia Region: 1994-97. South-East Asia Region, New Delhi, 1999.
2. Prüss-Üstün A, Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. *Am J Ind Med* 2005;48:482-90.
3. West DJ. The risk of hepatitis B infection among health professionals in the United States: a review. *Am J Med Sci* 1984; 287:26-33.
4. Mahoney FJ. Update on diagnosis, management and prevention of hepatitis B virus infection. *Clin Microbiol Rev* 1999;12:351-66.
5. CDC. Updated U.S: public health service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for post-exposure prophylaxis. *MMWR* 2001, 50 (No. RR-11):1-42.
6. Viral hepatitis B. Fact sheet [online] October 1, 2004. Available at: <http://www.cdc.gov/ncidod/diseases/hepatitis/b/> (last accessed on August 12, 2015)
7. Bhattarai S, K C S, Pradhan PM, Lama S, Rijal S. Hepatitis B vaccination status and needle-stick and sharps-related injuries among medical school students in Nepal: a cross-sectional study. *BMC Res Notes*. 2014; 7:774.
8. Khan N, Ahmed SM, Khalid MM, Siddiqui SH, Merchant AA. Effect of gender and age on the knowledge, attitude and practice regarding hepatitis B and C and vaccination status of hepatitis B among medical students of Karachi, Pakistan. *J Pak Med Assoc* 2010; 60:450-5.
9. Noubiap JNN, Nansseu JRN, Kengne KK, Ndoula ST, Agyingi LA. Occupational exposure to blood, hepatitis B vaccine knowledge and uptake among medical students in Cameroon. *BMC Med Edu* 2013;13:148.
10. Shiao J, Guo L, Mclaws ML. Estimation of the risk of blood borne pathogens to health care workers after a needle stick injury in Taiwan. *Am J Infect Control* 2002;30:15-20.
11. Lokesh U, Srinidhi D, Reddy KS. Post exposure prophylaxis to occupational injuries for general dentist. *J Indian Prosthodont Soc* 2014;14:1-3.

12. Ibrahim N, Idris A. Hepatitis B awareness among medical students and their vaccination status at Syrian Private University. *Hepat Res Treat* 2014;Article ID 131920:7 pages.
13. Paudel DP, Prajapati SK, Paneru DP. Hepatitis B related knowledge and perception of nursing students: an institutional based study in Kathmandu, Nepal. *Int J Health Sci Res* 2012;2:57–66.
14. Gerlich WH. Medical virology of hepatitis B: how it began and where we are now. *Virology* 2013;10:239.
15. Doebbeling BN, Ferguson KJ, Kohout FJ. Predictors of hepatitis B vaccine acceptance in health care workers. *Med Care* 1996;34:58–72.
16. Taalat M, Kandell A, El-Shoubary W, et al. Occupational exposure to needle stick injuries and hepatitis B vaccination coverage among health care workers in Egypt. *Am J Infect Control* 2003;31:469–74.
17. Bond WW, Petersen NJ, Favero MS. Viral hepatitis B: aspects of environmental control. *Health Lab Sci* 1977;14:235–52.
18. CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). Part II: immunization of adults. *MMWR* 2006;55(No. RR-16):1–25.
19. Lok ASF, McMahon BJ. Chronic hepatitis B: AASLD practice guidelines. *Hepatology* 2007;45:507–39.
20. Bond WW, Favero MS, Petersen NJ, Gravelle CR, Ebert JW, Maynard JE. Survival of hepatitis B virus after drying and storage for one week. *Lancet* 1981;1:550–1.
21. Infection Control Policy for Viral Hepatitis. Infection Prevention and Control Committee January 2002. Cardiff and Vale NHS Trust Board April 2002. Available at: <http://www.cardiff.ac.uk/osheu/resources/INFECTION%20CONTROL%20POLICY%20FOR%20VIRAL%20HEPATITIS.pdf>.
22. Ramakrishnan M, Chandran A, Samuel V, Seiramineni AK. Hepatitis B infection awareness among dental graduate students: a cross sectional study. *Int Sch Res Notices* 2014; Article ID 389274, 6 pages.

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