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Hepatitis B Vaccination Status among Healthcare Workers in a Tertiary Cardiac Centre: A Descriptive Cross-sectional Study

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Abstract

Background: Healthcare Workers (HCWs) are at increased risk of occupational exposure to the Hepatitis B virus infection, making vaccination crucial for infection prevention. This study aims to assess vaccination coverage and identify factors influencing uptake among HCWs at a tertiary cardiac center.

Methods: We conducted a descriptive cross-sectional study at Shahid Gangalal National Heart Centre (SGNHC), involving 479 healthcare workers, including doctors, nurses, paramedical staffs, and support personnel. Data were collected using a structured electronic and paper-based questionnaire, ensuring comprehensive coverage of vaccination history and awareness.

Results: Participants had a mean age of 32.79 ± 9.0 years, with 43 (8.98%) males and 436 (91.02%) females. Of the 479 workers, 179 (37.36%) received complete vaccinations, while 215 (44.89%) received incomplete doses, and 85 (17.75%) had no record of vaccination. The primary reason for non-vaccination was a lack of awareness, reported by 58 (12.11%) of participants; knowledge of the required doses of the vaccination series was 74.11% and 19.62%, respectively.

Conclusion: In conclusion, the vaccination coverage among healthcare workers at this tertiary cardiac center is low, primarily attributable to inadequate knowledge and awareness. Institutional policies mandating HBV vaccination and education initiatives are recommended.

Keywords: Hepatitis B Vaccine, Infection control, Occupational health

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Introduction

Hepatitis B virus (HBV) infection is a public health concern, especially among frontline healthcare workers (HCWs). Primary strategy for its prevention is vaccination. It is effective and has been available since 1982.[1] Healthcare workers need special consideration for hepatitis B virus (HBV) vaccination, however, this is not widely implemented in low- and middle-income countries.[2] Different factors influence vaccination status, such as lack of knowledge and awareness, cost, availability, and hesitancy.[3]

Healthcare workers are exposed to various potential sources of bloodborne pathogens and play a pivotal role in patient care.[4] Despite advancements in infection control practices and the availability of safe and effective hepatitis B vaccines, a substantial proportion of healthcare workers globally remain susceptible to HBV infection.[5]

This study aimed to assess the hepatitis B vaccination coverage and identify factors that influence or hinder vaccination uptake among healthcare workers in a tertiary cardiac center. It will help to strengthen vaccination campaigns, propose evidence-based recommendations to boost immunization efforts, and mitigate the risk of hepatitis B transmission in healthcare settings.

Methods

A cross-sectional study was conducted at Shahid Gangalal National Heart Centre (SGNHC), a tertiary cardiac Centre in Nepal, after obtaining an ethical approval from the Institutional Review Committee, SGNHC (IRC No. 13-2023). Data were collected from 13 December 2023 to 18 April 2024 while maintaining participants' confidentiality. An enumerative sampling method, which included every eligible unit in the population, was employed. A total of 479 healthcare workers (HCWs) representing various job roles such as doctors, nurses, paramedical staffs, and support personnel were included. All current employees who provided consent to participate were included, while former employees and those on leave were excluded. Data were collected using a structured questionnaire via Kobo Toolbox; the web-based and paper-based questionnaire. The questionnaire covered demographic information, vaccination history, awareness, knowledge, barriers, facilitators, and prior hepatitis B infection. Validity of the questionnaire was ensured by infection prevention and control experts of the center. SPSS version 20 was used for data analysis. For continuous variables (age), mean ± Standard Deviation and for categorical values (education, gender etc.), median and inter quartile range was calculated. The association of categorical variables was determined by Chi-square test. A P-value of less than 0.05 was considered to be significant.

Results

Out of a total of 668 healthcare workers approached for participation in the study on hepatitis B infection, 479 individuals responded and completed the survey, resulting in a response rate of 71.74%. The mean age of the participants was 32.79 years with a standard deviation of ±9.0 years, indicating a relatively young workforce. The majority of participants were female (91.02%), while only 8.98% were male. Regarding educational background, the largest proportion had attained a bachelor's degree (59.5%), followed by higher secondary education (12.32%) and master's degree holders (10.02%). A small portion of the participants were either illiterate (4.18%) or had only completed primary education (4.59%). In terms of professional roles, three-fourths (75.16%) were medical personnel, whereas 24.84% were engaged in non-medical roles within the healthcare setting.

Table 1: Socio-demographic Characteristics

S. No.	Variables	Number (n=479)	Percent
1.	Age (mean)	32.79 ± 9.0 years	
2.	Gender		
	• Male	43	8.98
	• Female	436	91.02
3.	Educational status		
	• Illiterate	20	4.18
	• Primary Level	22	4.59
	• Secondary Level	45	9.39
	• Higher Secondary Level	59	12.32
	• Bachelor	285	59.50
	• Masters	48	10.02
4.	Designation		
	• Medical	360	75.16
	• Non-medical	119	24.84

Table 2 shows that 37.36% of workers had received the complete doses, 44.89% had received incomplete doses, and 17.75% had not received the hepatitis B vaccine. The main reason for not receiving the vaccine was a lack of awareness, reported by 12.11% workers.

Table 2. Hepatitis B vaccination status

S. No.	Variables	Number (n=479)	Percent
1.	Have you received the Hepatitis B vaccine?		
	• Yes		
	▫ Complete Dose	179	37.36
	▫ Incomplete Dose	215	44.89
	• No	85	17.75
2.	If you have not received the Hepatitis B vaccine, please specify the reasons:		
	• Concerns about vaccine safety.	11	2.30
	• Lack of awareness about the vaccine.	58	12.11
	• Medical reasons (e.g., allergies).	2	0.42
	• Others	14	2.92

Table 3 shows the knowledge and practices of the participants. Majority (77.45%) of respondents reported that they followed standard precautions during patient care, while others practicing them "often" (15.03%), "sometimes" (4.80%), "rarely" (1.46%), or "never" (1.26%). About 17.95% of participants had experienced an occupational exposure (e.g., needle-stick injury), but only 12.53% had had post-exposure prophylaxis after such incidents.

The knowledge assessment showed that 96.87% correctly identified the primary purpose of the HBsAg vaccine. However, 59.71% incorrectly believed that the vaccine provides lifelong immunity, highlighting a significant knowledge gap. Most participants (79.95%) recognized sexual contact as a major route of transmission, while a smaller group (15.87%) correctly identified close contact (horizontal transmission). A majority (74.11%) knew that three doses are required for a complete vaccination schedule, and 76.20% selected the recommended 0-, 1-, and 6-months schedule. In terms of additional preventive practices, 59.92% correctly noted that practicing safe sex, while 26.72% chose hand hygiene and 10.23% mentioned regular follow-up. Nearly all participants (98.96%) knew that hepatitis B can be prevented by the vaccine.

Table 3. Hepatitis B Knowledge and Practice

S. No.	Variables	Number (n=479)	Percent
1	Do you consistently practice standard precautions while providing patient care?		
	• Always	371	77.45
	• Often	72	15.03
	• Sometimes	23	4.80
	• Rarely	7	1.46
	• Never	6	1.26
2	Have you ever experienced an occupational exposure (e.g., needlestick injury) involving a potentially infected patient?		
	• Yes	86	17.95
	• No	393	82.05
3	Did you seek medical attention and follow the appropriate post-exposure protocols?		
	• Yes	60	12.53
	• No	26	5.42
4	What is the primary purpose of the HBsAg vaccine?		
	• To treat Hepatitis B infection	6	1.25
	• To screen for Hepatitis B infection	5	1.04
	• To prevent Hepatitis B infection*	464	96.87
	• To cure Hepatitis C infection	4	0.84
5	How is Hepatitis B primarily transmitted?		
	• Through the air	8	1.67
	• Through contaminated water	12	2.51
	• Through sexual contact	383	79.95
	• Through close contact (Horizontal Transmission) *	76	15.87
6	How many doses are typically required for a complete HBsAg vaccination series?		
	• 1 dose	20	4.18
	• 2 doses	10	2.09
	• 3 doses*	355	74.11
	• 4 doses	94	19.62
7	What is the recommended dosing schedule for the HBsAg vaccine?		
	• 0, 1, and 2 months	42	8.76
	• 0, 1, and 6 months*	365	76.20
	• 0, 2, and 12 months	20	4.18
	• 0, 6, and 12 months	52	10.86
8	Does HBsAg vaccine provide lifelong immunity after completion of the recommended doses?		
	• True	193	40.29
	• False*	286	59.71
9	In addition to vaccination, what other practice is important for preventing Hepatitis B transmission?		
	• Regular follow up	49	10.23
	• Sharing personal items	15	3.13
	• Practicing safe sex*	287	59.92
	• Effective hand hygiene	128	26.72
10	Which of the following diseases can be prevented by the HBsAg vaccine?		
	• Measles	1	0.21
	• Tuberculosis	4	0.84
	• Polio	0	0
	• Hepatitis B*	474	98.96
11	Are you aware of the proper protocols for handling sharps and disposing of them safely?		
	• Yes	457	95.41
	• No	22	4.59

*Indicates the correct response

Discussion

This study was conducted to assess the hepatitis B vaccination coverage, knowledge, and practices among healthcare workers (HCWs) at a tertiary cardiac center in Nepal. The findings point out the issues related to hepatitis B immunization status and associated awareness among frontline health professionals. The study population was predominantly young, with a mean age of 32.79 years, and had a notably high proportion of female workers (91.02%) as most of the responder are nursing staffs.

In a previous study done in Gandaki Province in Nepal, the study participant's mean age was 25.4 ± 5.6 with only half (51.7%) of the participants being completely vaccinated. The major reason for not getting vaccination was negligence.[6] In our study, 82.25% of the healthcare workers received at least one dose of the vaccine which is similar to the multi-site study conducted in China (80.8%).[7] Among the healthcare workers who were not vaccinated (17.75%), the main cause of non-vaccination was lack of awareness (12.11%). Studies have found that hepatitis B vaccination rates among healthcare workers vary due to factors like unavailable vaccines, busy work schedules, costs, and concerns about vaccine safety.[2] A multicenter cross-sectional study conducted in Bangladesh across 11 tertiary hospitals involving 2,046 healthcare workers reported an overall hepatitis B vaccination coverage of 66.6%. This finding was higher than the complete vaccination rate observed in our study. Majority of unvaccinated healthcare workers in that study expressed willingness to receive the vaccine if it were offered at no cost. This reflects a common barrier across resource-limited settings like ours.[8]

Although 95.41% of the healthcare workers were aware of proper protocols for handling and disposing of sharps, 17.95% of the healthcare workers have encountered an injury in our setting, which is high, indicating the need for proper monitoring of safe healthcare practices. A study done in a similar setting also showed inadequate knowledge of needle stick injuries among healthcare workers and a lack of appropriate precautions.[9] There is a need to update and implement protocols regarding needlestick injuries, especially considering challenges like busy schedules, costs, and vaccine safety concerns.[2]

In our study, participants showed fair knowledge of the hepatitis B vaccine, as 96.87% knew the primary aim of vaccination and 74.11% correctly answered the total number of doses for complete vaccination. These findings are similar to a recent study done among healthcare workers in Cambodia, which demonstrated adequate knowledge of the hepatitis B virus and vaccination with a mean knowledge score of 7.3 ± 1.6.[10] However, 40.29% still think that complete vaccination provides lifelong immunity, which is alarming because these individuals might not seek post-exposure prophylaxis, and contact transmission is fairly common due to occupational exposure. The majority of respondents, i.e., 383 (79.95%) participants in our study, marked sexual contact, and only 76 (15.87%) marked close contacts such as needle stick injury, tattooing, piercing, community shaving, or sharing of sharps at home or workplaces as the primary source of HBsAg transmission. This highlights the importance of awareness of post-exposure prophylaxis among healthcare workers.

Blood-borne diseases like Hepatitis B virus (HBV) in HCWs have been significantly found as a result of occupational exposure to contaminated sharps.[11] Transmission risk was found to be 2-40% for HBV through percutaneous injuries, as per previous studies.[12] So, assessing and emphasizing hepatitis B vaccination among HCWs holds increasing importance in medical practice. Studies also indicate an impact on the psychological well-being of the wounded HCWs, affecting their quality of life due to anxiety and concerns about contracting the sickness or infecting their family.[13]

As per a meta-analysis, measures on prevention to decrease the risk of HBV on HCWs which includes educational awareness, training HCWs on universal safety precautions, safe injection practices, sharp waste disposal, and delivery of engineered safety devices by the health care institution will contribute to reduce occupational exposure by 62%.[14]

Low cost of HBV vaccination and its effective prevention as stated by other studies will be an economical move for a country like Nepal.[15] Inadequate vaccination coverage not only puts healthcare workers at risk but also poses a potential threat to patient safety, as infected healthcare workers can inadvertently transmit the virus to patients. In addition, it can be used as an effective Post-Exposure Prophylaxis (PEP) due to its feasible exposure management.[11] So, efforts should be made to immunize the HCWs as early as possible in their career.

The strength of our study is that we have assessed knowledge and practices of HBV vaccination among the high-risk groups of occupational exposure. This study has a few limitations. Self-reporting of vaccination could introduce recall bias, potentially leading to both underestimation and overestimation of hepatitis B vaccination status which affect the accuracy of coverage estimates and actual awareness or adherence to safety protocols. The study was conducted at a single tertiary cardiac center in Nepal; therefore, the findings cannot be generalized to other healthcare institutions in Nepal or similar low-resource settings. The population in a cardiac center may differ significantly in terms of awareness, education, and access to vaccination compared to those in general or rural hospitals.

Based on our study findings, following recommendations can be proposed to improve hepatitis B vaccination coverage among healthcare workers. First hospitals should make vaccination mandatory for all new staff and offer the vaccines for free or at a low cost. Secondly regular training and awareness programs should be held to correct common misconceptions—like the belief that the vaccine gives lifelong protection. Lastly, hospitals should also keep a record of vaccination status of the staffs.

Conclusion

Although hepatitis B vaccination uptake among healthcare workers at our center is better than some previous reports, significant gaps in coverage and awareness persist, particularly the need for post-exposure prophylaxis and the misconception of lifelong immunity after complete vaccination. Despite good general knowledge, a considerable number of healthcare workers remain unvaccinated due to a lack of awareness.

Sources of Funding

None

Conflicts of Interest

None

References

1. Auta A, Adewuyi EO, Kureh GT, Onoviran N, Adeloye D. Hepatitis B vaccination coverage among health-care workers in Africa: A systematic review and meta-analysis. Vaccine. 2018 Aug 6;36(32 Pt B):4851-4860. doi: 10.1016/j.vaccine.2018.06.043. Epub 2018 Jun 30. PMID: 29970299.
2. Biset Ayalew M, Adugna Horsa B. Hepatitis B Vaccination Status among Healthcare workers in a Tertiary Hospital in Ethiopia. Hepat Res Treat. 2017;2017:6470658. doi: 10.1155/2017/6470658. Epub 2017 Jun 29. PMID: 28751988; PMCID: PMC5511672.
3. Soomar SM, Siddiqui AR, Azam SI, Shah M. Determinants of hepatitis B vaccination status in healthcare workers of two secondary care hospitals of Sindh, Pakistan: a cross-sectional study. Hum Vaccin Immunother. 2021 Dec 2;17(12):5579-5584. doi: 10.1080/21645515.2021.1986332. Epub 2021 Nov 10. PMID: 34757865; PMCID: PMC8903980.
4. Singhal V, Bora D, Singh S. Hepatitis B in healthcare workers: Indian scenario. J Lab Physicians. 2009 Jul;1(2):41-8. doi: 10.4103/0974-2727.59697. PMID: 21938248; PMCID: PMC3167966.
5. 5. Meireles LC, Marinho RT, Van Damme P. Three decades of hepatitis B control with vaccination. World J Hepatol. 2015 Aug 28;7(18):2127-32. doi: 10.4254/wjh. v7.i18.2127. PMID: 26328023; PMCID: PMC4550866.
6. Bhattarai S. Knowledge, Attitude and Practice of Hepatitis B Vaccination among Healthcare workers at Manipal Teaching Hospital. Kathmandu Univ Med J (KUMJ). 2020 Oct.-Dec.;18(72):256-259. PMID: 34165092.
7. Liu Y, Ma C, Jia H, Xu E, Zhou Y, Zhang Z, Lu L, Rodewald L, Hao L. Knowledge, attitudes, and practices regarding hepatitis B vaccination among hospital-based doctors and nurses in China: Results of a multi-site survey. Vaccine. 2018 Apr 19;36(17):2307-2313. doi: 10.1016/j.vaccine.2018.03.018. Epub 2018 Mar 19. PMID: 29567035.
8. Harun MGD, Sumon SA, Mohona TM, Rahman A, Abdullah SAHM, Islam MS, Anwar MMU. Hepatitis B Vaccination Coverage among Bangladeshi Healthcare Workers: Findings from Tertiary Care Hospitals. Vaccines (Basel). 2022 Dec 24;11(1):41. doi: 10.3390/vaccines11010041. PMID: 36679886; PMCID: PMC9865822.
9. Gurubacharya DL, Mathura KC, Karki DB. Knowledge, attitude and practices among healthcare workers on needle-stick injuries. Kathmandu Univ Med J (KUMJ). 2003 Apr-Jun;1(2):91-4. PMID: 16388204.
10. Sok S, Chhoung C, Sun B, Ko K, Sugiyama A, Akita T, Fukuma S, Tanaka J. Knowledge of hepatitis B infection, hepatitis B vaccine, and vaccination status with its associated factors among healthcare workers in Kampot and Kep Provinces, Cambodia. BMC Infect Dis. 2024 Jul 1;24(1):658. doi: 10.1186/s12879-024-09571-y. PMID: 38956495; PMCID: PMC11218137.
11. Prüss-Ustün 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 Dec;48(6):482-90. doi: 10.1002/ajim.20230. PMID: 16299710.
12. Wilburn SQ, Eijkemans G. Preventing needlestick injuries among healthcare workers: a WHO-ICN collaboration. Int J Occup Environ Health. 2004 Oct-Dec;10(4):451-6. doi: 10.1179/oeh.2004.10.4.451. PMID: 15702761.
13. Sohn JW, Kim BG, Kim SH, Han C. Mental health of healthcare workers who experience needlestick and sharps injuries. J Occup Health. 2006 Nov;48(6):474-9. doi: 10.1539/joh.48.474. PMID: 17179640.
14. Tarigan LH, Cifuentes M, Quinn M, Kriebel D. Prevention of needle-stick injuries in healthcare facilities: a meta-analysis. Infect Control Hosp Epidemiol. 2015 Jul;36(7):823-9. doi: 10.1017/ice.2015.50. Epub 2015 Mar 13. PMID: 25765502.
15. Mahoney FJ, Stewart K, Hu H, Coleman P, Alter MJ. Progress toward the elimination of hepatitis B virus transmission among healthcare workers in the United States. Arch Intern Med. 1997 Dec 8-22;157(22):2601-5. PMID: 9531229.