Publisher
MEDRESEARCH
www.medresearch.in

Tropical Journal of Pathology and Microbiology

2024 Volume 10 Number 3 Jul-Sep

E-ISSN:2456-1487
P-ISSN:2456-9887
RNI:MPENG/2017/70771

Research Article

Hepatitis B infection

Knowledge, Attitude, Practice and associated factors towards Hepatitis B infection among Health Care Workers and Medical Students at tertiary care hospital in North India

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DOI:https://doi.org/10.17511/jopm.2024.i03.01

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Background: Hepatitis B represents a significant global public health challenge. India is in the intermediate endemicity zone with hepatitis B surface antigen prevalence among the general population ranging from 2% to 8%. Among healthcare workers, seroprevalence is two to four times higher than that of the general population therefore it can be prevented with strategies like safe and effective vaccination, increasing awareness and adhering to universal precautions.

Objective: To assess the knowledge, attitude and practice regarding Hepatitis B among healthcare workers and medical students.

Material and Methods: This is an analytical cross-sectional study conducted among 345 healthcare workers and medical students of Government Medical College Amritsar and associated tertiary care at Guru Nanak Dev Hospital, Amritsar from March to April 2024 using a semi-structured, pretested questionnaire.

Results: Among 345 participants, correct responses towards Knowledge, Attitude and Practice were given by 79%, 85% and 55% respectively. 84.25 % knew about the mode of transmission of hepatitis B virus. Only 56.2% of the participants had completed vaccination. In this study, a clear association was observed between higher educational attainment and increased awareness, as well as the adoption of favorable practices.

Conclusion: Although study participants exhibited high levels of knowledge and positive attitudes, their practices fell short of expectations. Consequently, implementing periodic workshops and symposia focused on safe workplace practices could effectively enhance awareness and reinforce adherence to standard guidelines.

Keywords: Knowledge, Attitude, Practice, Hepatitis B infection, Health Care Workers, Medical Students

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How to Cite this Article

Oberoi T, Kaur A, Oberoi L, Batra S, Kaur P, Knowledge, Attitude, Practice and associated factors towards Hepatitis B infection among Health Care Workers and Medical Students at tertiary care hospital in North India. Trop J Pathol Microbiol. 2024;10(3):31-37.
Available From https://pathology.medresearch.in/index.php/jopm/article/view/653

To Browse

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2024-06-14	2024-06-20	2024-06-25	2024-07-01	2024-07-07

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
Nil	None	Yes	13.32	

Introduction

Hepatitis B is a major global health concern, with approximately one-third of the world population infected, including about 254million with chronic infection, 1.2million new infections each year and 1.1million deaths, mostly from cirrhosis and hepatocellular carcinoma.[1] HBV is an enveloped DNA virus and is the only DNA virus in hepatitis viruses.[2]

HBV is mostly transmitted by contact with an infected person's blood and other bodily fluids [3], through sharing needles during injections, reusing contaminated needles, unprotected sexual contact and perinatal transmission [4,5]. HBV infection may result in subclinical or asymptomatic infection, acute self-limiting hepatitis or fulminant hepatitis requiring liver transplantation. Persons infected with HBV may also develop chronic HBV infection which can lead to cirrhosis or hepatocellular carcinoma [6].

India falls in the intermediate endemicity zone, prevalence of 2 -7% with an average of 4% [7]. Among the health care workers (HCW), seroprevalence is two to four times higher than that of the general population [8].

HCWs, especially physicians, nurses and medical students are always in direct contact with patients and are vulnerable to the acquisition of these infectious diseases mainly through percutaneous or mucosal exposure to infected blood or body fluids [9] [10].

According to a WHO study, the annual estimated proportions of HCW exposed to blood-borne pathogens globally were 2.6% for HCV, 5.9% for HBV and 0.5% for HIV, corresponding to about 16,000 HCV infections and 66,000 HBV infections in healthcare workers worldwide [11]. Hepatitis B is the most commonly transmitted blood-borne infection [12].

Even minute quantities of blood can facilitate HBV transmission, rendering it the most readily transmissible bloodborne pathogen. In the scenario where an HCW lacking vaccination experiences a needle prick from blood containing Hepatitis B surface antigen (HBsAg), the risk of infection ranges from 6% to 30%, influenced by the presence or absence of Hepatitis B e antigen (HBeAg) and HBV-DNA status [13].

Hepatitis B infection transmission can be interrupted through vaccination, using safety precautions while handling infectious material, proper sterilization of medical equipment and waste handling [14,15,16], HBV vaccination is the cornerstone of HBV infection control as it provides lifelong immunity [17]. The Centre for Disease Control and Prevention (CDC) has recommended that all HCWs should receive a complete schedule of hepatitis B vaccination [18].

Hence, it is strongly recommended that all HCWs receive vaccination against HBV infection as a fundamental component of occupational infection control measures. However, despite this imperative, vaccination coverage among HCWs, particularly in developing nations, remains alarmingly low, posing significant challenges for both the country and HBV patients alike. Adequate knowledge and appropriate attitudes are paramount in preventing occupational exposure to HBV. Nevertheless, there exists considerable variability among HCWs in their understanding of HBV transmission and preventive measures, with evident inadequacy observed, particularly in many developing countries [19,20,21]. Therefore, the present study was conducted to understand this difference and to assess knowledge, attitude, practice and associated factors regarding Hepatitis B among HCWs and medical students in a tertiary care hospital.

Methodology

Type of Study: Analytical cross-sectional study
Study setting: Government Medical College, Amritsar and Guru Nanak Dev Hospital, Amritsar. (Internet-based survey)
Study Duration: From 1 March 2024 to 30 April 2024
Inclusion Criteria: Healthcare workers and medical students studying or working in Government Medical College Amritsar and associated tertiary care Guru Nanak Dev Hospital, Amritsar.
Exclusion Criteria: Healthcare professionals not giving consent for participation in the study.
General population
Sample Size: The sample size was calculated using Daniel's formula, $N=Z^2*P(1-P)/d^2$, Where N is the sample size, Z is the statistic corresponding to the level of confidence (1.96 for the level of confidence of 95%), P is expected prevalence, and d is precision.

Taking the prevalence of knowledge regarding hepatitis B infection among healthcare workers from a previous study as 85% and precision as 5%, the minimum sample size required comes out to be 196. However, 345 Healthcare workers and medical students fulfilling inclusion criteria participated in the study and all were included for data analysis.

Data Collection Tool: Semi-structured & pre-tested questionnaire was prepared on Google Forms. Consent was taken in the first section of the Google form.

The questionnaire includes the following components:

1. Demographic and job-related data of the participants.
2. Questions assessing knowledge about hepatitis B infection.
3. Questions assessing attitude regarding hepatitis B infection.
4. Questions assessing practice regarding Hepatitis B infection.

Operational Definition:

1. Knowledge

Good knowledge: If the respondents were able to answer 70% or more of knowledge items correctly [23].
Poor knowledge: If the respondents answered less than 70% of knowledge items [23].

2. Attitude

Positive attitude: If the respondents were able to give the correct answer for 70% or more of attitude items correctly [23].
Negative attitude: If the respondents answered less than 70% of attitude items [23].

3. Practice

Good practice: When the study participants were at least able to answer 70% or more practice items correctly [23].
Poor practice: When the participants were unable to answer 70% of practice items correctly [23].

Data Collection Technique:

After the approval from the Institutional Ethics Committee (IEC), the link to the questionnaire was shared among healthcare professionals and medical students of Govt Medical College Amritsar and Guru Nanak Dev Hospital Amritsar.

A period of one month was provided to submit their response. Two reminder messages were sent during this period. Confidentiality was ensured as no personal details were asked of the participants.

Statistical Analysis:

Data collected was imported into the Microsoft Excel sheet and Statistical analysis was done using the Epi Info statistical package for Windows (freely available online). Normally distributed numerical data was presented as mean (standard deviation). Categorical data was presented as frequencies and percentages. Appropriate statistical tests were used to test the level of significance.

Results

Out of the total 345 study participants, 64.35% were females and 35.65% were males. (Table 1)

Majority participants were medical students 250(72.46%) followed by doctors 46(13.33%), staff nurses 30(8.70%) and laboratory technicians 19(5.51%). (Figure 1) A good proportion of the participants were in the age group 18-24(75.36%). (Figure 2)

Table 1: Gender-wise distribution of study participants

Gender	Frequency	Percent
Male	123	35.65%
Female	222	64.35%

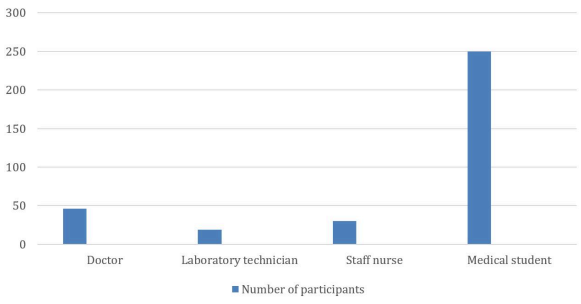

Figure 1: Profession wise distribution of study participants

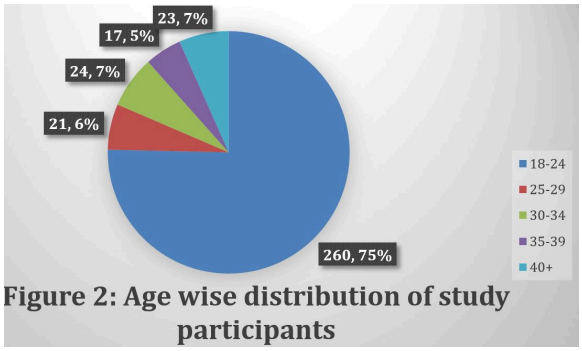

Figure 2: Age wise distribution of study participants

Knowledge on prevention of HBV

The majority of study participants demonstrated comprehension of HBV infection and its modes of transmission. 88.4% knew about HBV transmission by needle stick injury, 90.7% knew it could be transmitted sexually and 76% knew about vertical transmission. 81.9% knew it causes liver cancer. Out of 345 participants, 286 (82.8%) acknowledged the preventive benefits of the hepatitis B vaccine, however only 57.7% were familiar with the vaccination schedule. Only 37% knew hepatitis B is more transmissible than HIV. Among the participants, doctors (96%) were more knowledgeable followed by medical students (64%). The average knowledge level of the participants was 79%. (Table 2,5)

Table 2: Knowledge regarding Hepatitis B infection among study participants.

S.No.	Questions	Positive Response	Negative Response
1	Can Hepatitis B be transmitted by needle stick injury	88.4%	11.6%
2	Can Hepatitis B be transmitted sexually	90.7%	9.3%
3	Can Hepatitis B be transmitted by vertical transmission	76%	24%
4	Can Hepatitis B be transmitted by infected blood transfusion	83.7%	16.3%
5	Is HBV more transmissible than HIV	41.2%	58.8%
6	Can HBV cause liver cancer	81.9%	18.1%
7	Can safe needle disposal prevent Hepatitis B infection	90.7%	9.3%
8	Do you think vaccine can prevent Hepatitis B infection	82.8%	17.2%
9	Do You know the vaccination schedule for adults	57.7%	42.3%
10	Do you think HBV has laboratory tests	95.3%	4.7%
11	Do you know HBV vaccine effectiveness can be checked by testing (Anti-HBs) antibody levels	81.7%	18.3%
12	Do you know HBV has Post-exposure prophylaxis	73.1%	26.9%
13	Do you think Hepatitis B is more common in hospital workers than normal population	86%	14%

Attitude towards prevention of hepatitis B infection

88.7% of participants considered hepatitis B vaccination important for public health. According to 97.4% of participants, there was a need for more public education and awareness campaigns about hepatitis B and its vaccine.

89.7% believed that all patients should be tested for HBV before receiving health care. Out of 345 individuals, 316 (91.5%) believed that following infection control guidelines would protect them from HBV infection. In our study, 92.1% responded that they would consult a nodal officer for needle stick injury for post-exposure prophylaxis. The average attitude among study participants was 85%. The highest favourable attitude was seen among doctors (80%). Participants with higher levels of education showed more favourable attitudes than those with lower levels of education. (Table 3,5)

Table 3: Attitude regarding Hepatitis B infection among study participants.

S.No.	Questions	Positive Response	Negative Response
1	Is Hepatitis B vaccination important for public health	88.7%	11.3%
2	Do you think the Hepatitis B vaccine is safe	95.3%	4.7%
3	Do you believe there is a need for more public education and awareness campaigns about Hepatitis B and its vaccine	97.4%	2.6%
4	Should Hepatitis B patients be allowed to work routinely	77.6%	22.4%
5	Should Hepatitis B patients be isolated	73.7%	26.3%
6	Should Hepatitis B patients abandon sexual contact	73.2%	26.8%
7	Do you think all patients should be tested for HBV before receiving healthcare	89.7%	10.3%
8	Do you feel comfortable while taking care of HBV patient	73%	27%
9	Do you think infection control guidelines protect from being infected with HBV at work	91.5%	8.5%
10	In case of being exposed to possible risk factors, would you consult the nodal officer for NSI for post-exposure prophylaxis	92.1%	7.9%

Practice level towards HBV

Of most of the study participants, 85.3% followed safe injection practices. 286 (83%) stated that they use gloves during sterile and invasive procedures. However, only 44.3% wore safety glasses. 67.40% were never screened for hepatitis B. Although HBV vaccination is mandated for health care workers as per infection control guidelines only 56.2% had completed 3 doses of the vaccination schedule, out of which only 30.4% had their (Anti-HBs) antibody levels checked. 12.90% had needle stick injuries out of which only 54.7% of the cases were reported. Overall practice score was 55%.

Good practice was seen among doctors 59% followed by staff nurses 50%. (Table 4,5)

Table 4: Practice regarding Hepatitis B infection among study participants.

S.No.	Questions	Positive Response	Negative Response
1	Do you always practice safe injection practices	85.3%	14.7%
2	Do you always use gloves during procedures	83%	17%
3	Do you always wear safety glasses during procedures	44.3%	55.7%
4	Have you ever been screened for Hepatitis	32.6%	67.4%
5	Have you completed 3 doses of the vaccination schedule	56.2%	43.8%
6	Have you ever had a blood test to check (Anti-HBs) antibody levels	30.4%	69.6%
7	Do you dispose of sharps properly after a procedure	95.9%	4.1%
8	Have you ever had a needle stick injury	12.1%	87.9%
9	In case of needle stick injury, do you always report it	54.7%	45.3%

Table 5: Level of Knowledge, attitude, and practice among study participants towards HBV transmission and prevention

Profession	Knowledge n (%)		Attitude n (%)		Practice n (%)	
	Poor	Good	Negative	Positive	Poor	Good
Doctors	2 (4%)	44 (96%)	3 (7%)	43 (93%)	19 (41%)	27 (59%)
Staff Nurses	21 (70%)	9 (30%)	5 (16%)	25 (84%)	15 (50%)	15 (50%)
Laboratory Technician	8 (42%)	11 (58%)	5 (26%)	14 (74%)	15 (79%)	4 (21%)
Medical Students	90 (36%)	160 (64%)	61 (24%)	189 (76%)	197 (79%)	53 (21%)

Discussion

Our study evaluates the knowledge, attitude and practice of healthcare workers and medical students. The majority of the participants were medical students. Knowledge regarding hepatitis B infection was maximum among doctors (96%) followed by medical students (64%), lab technicians (58%) and staff nurses (30%) which was similar to the study in Ethiopia [22]. Most participants acknowledged the modes of HBV transmission, including needle stick injury (88.4%), Sexual contact (90.7%), blood transfusion (83.7%) and perinatal transmission (76%). This was similar to the study conducted in Nigeria over 80%, identified percutaneous injury, contact with mucosal membranes, contact with scratched skin and potentially infected tissue as routes of HBV infection.[23]

Sustainable strategies for HBV elimination involve establishing safe work environments that emphasize infection control measures, such as displaying procedures for post-exposure prophylaxis, safe handling of sharps, timely reporting of needle stick injuries and maintaining universal precautions. Nearly two-thirds of study participants felt the need to improve and adhere to infection control measures at the workplace and this was in discordance with the study conducted by Eshwari K in Karnataka [24].

According to our study findings, 50% of nurses follow safe injection practices and wear gloves during sterile and invasive procedures. This finding was contrary to a study conducted in South India, 90% of the nurses followed guidelines correctly [25]. In the present study, 12.10% of participants reported needle stick injury, whereas the literature reports the risk of exposure to needle stick injury among HCWs to be 25 – 65% [26].

The spectrum of HBV infection ranges from subclinical, acute hepatitis to fulminant liver failure necessitating transplantation, and chronic infection predisposing to cirrhosis or hepatocellular carcinoma. Thus, vaccination emerges as a crucial strategy for preventing HBV transmission and averting its consequential complications. The majority (81.9%) of study participants knew about associated complications. Despite the availability of an efficient HBV vaccine for nearly two decades, 43.80% of participants in this study were not vaccinated. Similar findings have been observed from other parts of the country [12].

WHO reports that HBV vaccination coverage in low- and middle-income countries is only 18-39%, while it is reported to be 67-79% in high-income countries [17]. This observed distinction in vaccination coverage is due to mandatory vaccination policy in developed countries [27,28]. This draws attention to the need for making the vaccine mandatory for HCW recruitments and at regular intervals.

Despite demonstrating a commendable understanding of hepatitis B transmission and prevention, a notable proportion of study participants, including doctors, nurses, lab technicians, and medical students, remain unvaccinated, necessitating urgent action to bridge this gap.

Based on these findings, there is a clear mandate to establish critical frameworks like a safe workplace monitoring unit and a vaccine management system that incorporates free vaccination services and assessment of immune status post-vaccination. In conclusion, Despite the high level of knowledge and attitudes of the study participants, their performance was not satisfactory.

Therefore, regular training in workshops and seminars on the topic of workplace safety practices can be recognized and the need to adhere to standard guidelines can be reinforced.

What does the study add to existing knowledge?

This study delivered a valuable remark to improve the existing system for gaining awareness on hepatitis B infection, standard/universal precautions and their compliance to pre and post-exposure prophylaxis.

Limitations of the study

The study has certain limitations. As the study was conducted at Government Medical College, its associated hospital Guru Nanak Dev Hospital, Amritsar, it might not be representative of all health professionals across North India. As it is, a self-reported cross-sectional study finding, we cannot rule out the possibility of bias in estimating actual practices and compliance.

Acknowledgements

We thank the participants without whom this study would not have been possible.

Conflict of interest: none declared

Funding: nil

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