



ORIGINAL RESEARCH ARTICLE

NURSES' KNOWLEDGE ON POST EXPOSURE PROPHYLAXIS FOR HEPATITIS B VIRUS INFECTION IN TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Nurses are most vulnerable group for having Hepatitis B Virus (HBV) infection from blood and body fluids. These infections are preventable if the nurses have proper knowledge regarding Post Exposure Prophylaxis (PEP) for hepatitis B virus infections and utilize the PEP services. This study aimed to find out the nurses' knowledge on PEP for HBV infection.

Methods: A descriptive survey design was carried out among 116 randomly selected nurses working in different wards of tertiary care hospital. Data was collected from July 8th 2018 to 21st July 2018 using pre-tested self-administered questionnaire. Descriptive statistics was used to describe the variables and chi-square test was applied to explore the association between variables.

Results: Results of the study revealed that only 22.4% nurses had good, 21.6% had average, and 56.0% had poor knowledge on PEP for HBV. Majority (68.1%) of the nurses knew about the testing of HBsAg serum antigen after exposure. However, few nurses had knowledge on risk percentage of getting infection (29.3%), contact person for risk assessment (33.6%), constituents of PEP (29.9%), and PEP treatment for unvaccinated/incompletely vaccinated nurse in case of positive (38.8%) and negative (34.5%) sources. Moreover, working unit ($p=0.037$) and working experience ($p=0.027$) were the significant variables associated with the level of knowledge on PEP.

Conclusions: More than half of nurses' have poor knowledge on PEP for hepatitis B virus. Hence, there is need of regular in-service education and training for nurses on PEP for HBV to enhance their knowledge and to prevent potential infections.

INTRODUCTION

Hepatitis B is a major public health problem worldwide which can cause chronic liver diseases. An estimated 257 million people are living with hepatitis B virus (HBV) infection worldwide. It is also common in South East Asia region where 2% of the general population is infected with hepatitis B virus.¹ The burden of HBV is also common in Nepal where an estimated 0.9% of populations are infected with HBV.²

Hepatitis B is transmitted primarily through the perinatal route, sexual contact, percutaneous or mucosal exposure to infected blood products and various body fluids as well as through saliva, menstrual, vaginal and seminal fluids. Transmission of the virus may also occur through the reuse of needles and syringes either in health-care settings or among persons who inject drugs.¹

Health care workers are considered at a high risk of exposure to HBV infection through their exposure to infected blood and body fluids. These infections

are serious but may be preventable especially in the health care setting through appropriate and timely use post exposure prophylaxis.³ Vaccination against hepatitis B virus is the gold standard for post exposure prophylaxis and in certain circumstances, hepatitis B immune globulin is added for extra protection.⁴

Nurses are more vulnerable groups for HBV infection due to their frequent contact with patients' blood, body fluids, needles and instruments during care and invasive procedures. One study reported that 70.3% of health care workers working in tertiary care center of Nepal experienced needle stick injury during their working tenure and majority of injury (76.7%) occurred among nurses. Vaccination against hepatitis B virus was only completed by 69% of health workers. Major reasons of needle stick injury reported were lack of knowledge; not wearing gloves (i.e. ignorance), recapping of needle, and recapping using a single handed technique.⁵

Hence, it is vital for the nurses to have adequate knowledge about PEP for HBV infections to decrease the incidence of HBV infections among this risk groups. To our knowledge, there are limited studies available in Nepal focusing on the PEP for HBV. Therefore, this study was conducted to assess the knowledge on PEP for HBV infections among nurses working in tertiary care hospital in Chitwan.

METHODS

A descriptive survey was conducted to find out the knowledge on post exposure prophylaxis for hepatitis B virus in Chitwan Medical College Teaching Hospital, Chitwan (CMC-TH), Nepal. Population of the study was all 342 nurses who have completed Proficiency Certificate Level or Bachelor in Nursing and were working in different wards of CMC-TH. Those nurses who were working in the post of supervisor, assistant matron and matron were excluded from the study.

The sample size was calculated considering 74% prevalence of knowledge on PEP among nurses based in the study by Jharana et al.⁶ by using formula:

$$n_0 = \frac{z^2 pq}{d^2}$$

Where,

z signifies 95% confidence level which is 1.96

p (prevalence of PEP knowledge) =74% i.e.0.74

q = 1-p hence q = 1-0.74= 0.26

d = permissible error set at ±7% i.e. 0.07

N is the estimated population size=342

n is desired sample size

For finite population, where N = Total population

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Desired sample size including 10% non-response error was 105+11=116

Hence, 116 nurses were selected through random sampling with lottery method. The instrument used for data collection was self-developed; self-administered, pretested structured questionnaire. It consisted of two parts. Part 1 was related to socio-demographic, professional and information related characteristics. Part 2 included questions related to knowledge on PEP for hepatitis B virus. Prior to data collection, ethical approval was obtained from the Chitwan Medical College Institutional Review Committee (CMC-IRC) and individual informed consent was obtained from the respondents. Questionnaire was given to the respondents who gave consent to fill and researchers collected the filled form just after completion. Data was collected from the respondents during morning, evening and night shifts from July 8th 2018 to 21st July 2018. Obtained data were entered into Epi Data 3.1 and analyzed in SPSS version 16 for window. Descriptive statistics was used for demographic and knowledge related variables. Inferential statistics (chi-square test, p < 0.05) was used to assess the significance among study variables.

RESULTS

Out of 116 nurses, most of the nurses were below 25 years (80.2%) with the mean age 22.8(2.45) years. Majority of the nurses were unmarried (67.2%), had

completed PCL in nursing (74.1%), and were in staff nurse position (87.9%). Moreover, nearly two third nurses (63.8%) were working in general unit of the

hospital. Only twelve percent of the nurses had received in-service training on PEP for viral born infections (Table 1).

Table 1: Nurses' Socio-demographic and Profession related Characteristics n=116

Demographic Variables	Frequency (%)
Age group (in year)	
<25 years	93 (80.2)
≥25 years	23 (19.8)
<i>Mean age (SD) =22.8 (2.45) years, Min age-19 years, Max age-34 years</i>	
Marital status	
Married	38 (32.8)
Unmarried	78 (67.2)
Professional qualification	
PCL nursing	86 (74.1)
Bachelor in nursing	30 (25.9)
Total working experience (in months)	
Less than 12 months	50 (43.1)
12 and above months	66 (56.9)
Current designation	
Staff nurse	102 (87.9)
Senior staff nurse	14 (12.1)
Working unit	
General unit	74 (63.8)
Critical unit	42 (36.2)
Received training on PEP	
Yes	14 (12.1)
No	102 (87.9)
Availability of hospital protocol about PEP for HPV	
Yes	45 (38.8)
No	71 (61.2)

Nurses' knowledge on PEP was assessed by using self-administered structured questionnaire containing 19 knowledge related questions. Each correct answer was given "1" score and "0" for incorrect answer. Total score was ranged from 0 to 19. One third (33.6%) of the nurses had knowledge on the correct meaning of PEP and 31.9% correctly responded that percutaneous injury with hollow bore needles has high risk for transmission. Nearly half (47.4%) of the nurses correctly answered the first aid procedure and just one third (33.6%) knew

the first person to be contacted for risk assessment. Regarding PEP, majority (68.1%) of the nurses had knowledge about the test of HBsAg serum antigen after exposure. Just more than half (51.7%) had knowledge that treatment is not needed for percutaneous vaccinated and known non-responder if source is HBsAg negative. However, only half of the nurses knew the best time to start PEP of HBV (Table 2).

Table 2: Nurses' Knowledge on PEP for HBV Infection n=116

Statement	Correct Response Number (%)
PEP is short term therapy to prevent the transmission of pathogens after potential exposure	39 (33.6)
Percutaneous injury with hollow bore needles is considered high risk for transmission of HBV	37 (31.9)
Percentage of getting HBV infection after needle stick injuries with known HBV infected person is 30%	34 (29.3)
Hepatitis B virus remains infectious on environmental surfaces for at least 7 days	20 (17.2)
Washing the site with soap and water is the immediate action after getting needle prick injury	55 (47.4)
Physician should be contacted for risk assessment in the event of needle prick injury	39 (33.6)
HBsAg is serum antigen tested after an exposure to blood infected with HBV	79 (68.1)
Minimum level of anti-HBs antibodies in exposed person which can prevent the progression of HBV infection is 10mIU/ml	50 (43.1)
Best time to start post exposure prophylaxis of HBV is within 24 hours after exposure	58 (50.0)
Ineffective time to start PEP of HBV is beyond 7 days	15 (12.9)
Both HBIG and Hepatitis B vaccine are the constituents of post exposure prophylaxis for HBV infection	33 (28.9)
Both HBIG and vaccine series are recommended PEP for unvaccinated/incompletely vaccinated nurses if source is HBsAg positive	45 (38.8)
Both HBIG and vaccine series are recommended PEP for unvaccinated/incompletely vaccinated nurses if source is unknown or not available for testing	52 (44.8)
Both HBIG and vaccine series are recommended PEP for previously vaccinated and known non-responder if source is HBsAg positive	41 (35.3)
Hepatitis B vaccine series is recommended PEP for unvaccinated/incompletely vaccinated nurses if source is HBsAg negative	40 (34.5)
No treatment is recommended for previously vaccinated and known responder if source is HBsAg positive	9 (7.8)
No treatment is recommended for previously vaccinated and known responder if source is HBsAg negative	35 (30.2)
No treatment is recommended for previously vaccinated and known non-responder if source is HBsAg negative	60 (51.7)
No action is to be done on subsequent exposure to Hepatitis B virus infection	9 (7.8)

Table 3: Nurses' Level of Knowledge Regarding PEP for HBV Infection n=116

Level of Knowledge	Frequency (%)
Poor (<50%)	65 (56.0)
Average (50-75%)	25 (21.6)
Good (>75%)	26 (22.4)

Regarding knowledge on PEP, only 22.4% nurses had good, 21.6% had average and 56.0% had poor level of knowledge regarding PEP for hepatitis B virus infection (Table 3).

Nurses' level of knowledge on PEP for HBV was significantly associated with total working experience and working unit ($p < 0.05$). However, age, marital status, professional qualification and availability of hospital protocol were not associated with level of knowledge of PEP for HBV among nurses (Table 4).

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Table 4: Associations between Nurses' Level of Knowledge on PEP for HBV and Selected Variables n=116

Variables	Level of Knowledge			p-value*
	Good No. (%)	Average No. (%)	Poor No. (%)	
Age group (in year)				
<25 years	18(19.4)	22(23.7)	53 (57.0)	0.22
≥25 years	8 (34.8)	3 (13.0)	12 (52.2)	
Marital status				
Married	10(26.3)	10(26.3)	18(47.4)	0.420
Unmarried	16(20.5)	15(19.2)	47(60.3)	
Professional qualification				
PCL nursing	16(18.6)	21(24.4)	49(57.0)	0.176
Bachelor in nursing	10(33.3)	4(13.3)	16(53.3)	
Total working experience (in year)				
<1 year	14 (28.0)	5 (10.0)	31 (62.0)	0.027
≥1year	12 (18.2)	20 (30.3)	34 (51.5)	
Working unit				
General unit	19(25.7)	20(27.0)	35(47.3)	0.037
Critical care unit	7(16.7)	5(11.9)	30(71.4)	
Availability of hospital protocol about PEP				
Yes	7(15.6)	13(28.9)	25(55.6)	0.184
No	19(26.8)	12(16.9)	40(56.3)	

DISCUSSION

Results of our study revealed that very few nurses are aware of some important aspects of PEP for HBV and their overall level of knowledge on PEP for HBV is poor. This is alarming because nurses are the front line care providers and their knowledge is limited in PEP for HBV i.e. they are at greater risk for contracting HBV in their work place.

Nurses need to have high level of knowledge on PEP for HBV so that they can perform their duties with more cautions in order to avoid injuries/accidents. However, only 22.4% of nurses of this study had good, 21.6% had average and 56.0% had poor level of knowledge on PEP for HBV. This finding is similar to the study conducted by Machiya in Botswana

which revealed that 11.4% nurses had good level of knowledge, 54.0% moderate knowledge and 16% poor knowledge among nurses regarding Hepatitis B prevention and control.⁷

Knowledge on risk for transmission of HBV prevents nurses and patients from exposure to risk condition. Only 31.9% of nurses of our study knew that percutaneous injury with hollow bore needles has high risk for transmission of blood borne infections. This is worrying that 68.1% nurses did not know about it because these nurses are not likely to identify the risk even when exposed and thereby, limiting the chance of reporting and receiving the PEP treatment. These results are consistent with the findings

of study done by Konlan and colleagues where 57% nurses knew that needle stick injury poses exposure risk.⁸ Moreover, research evidence reported that nurses are most frequently exposed to needle stick injury in Nepal.⁵ These results indicate that nurses' are at risk of having needle stick injury but their knowledge on risk of transmission of HBV through percutaneous injury is poor.

Regarding the first aid management after exposure, 47.4% of nurses of this study had knowledge that the exposed site must be immediately washed with soap and water. This finding is consistent with the findings of studies in India⁹ and in Nepal⁶ where only 40.8% and 48.0% of nurses respectively had knowledge about the fact that the exposed site must be immediately washed with soap and water after NSI. Knowledge on contact person for risk assessment evaluation helps to seek immediate management after exposure to blood and blood products. Our study revealed that only one third (33.6%) of the nurses knew about first contact person for risk assessment which is almost similar with the findings of Makade et al. where 32.2% health care workers including nurses knew about whom to contact after NSI.¹⁰

In this study, more than two third (68.1%) nurses had knowledge that HBsAg serum antigen should be tested after an exposure to blood infected with HBV. Nearly one third (28.9%) nurses knew HBIG and Hepatitis B vaccine as the constituents of PEP for HBV whereas only 12.1% of nurses in Ghana answered on the constituents of PEP for HBV.⁸ It indicates the knowledge gap among nurses on PEP treatment against HBV infection. Knowledge on best time of initiation of PEP is important for the effectiveness of the therapy. Fifty percent of nurses answered correctly that within 24 hours is the best time to start post exposure prophylaxis of HBV. This finding shares similarity with the results of a study done by Konlan et al. where 69.4% nurses knew that PEP should be initiated as early as possible for the effectiveness of treatment.⁸

Our study revealed that less than half (43.1%) of the nurses had knowledge about the minimum level of anti-HBs antibodies in exposed person as 10mIU/ml whereas Machiya in Botswana reported 22.2% of health workers had knowledge about it.⁷ Moreover, this study showed that 38.8% nurses knew that both HBIG and vaccine series are recommended for un-

vaccinated nurses if source is HBsAg positive. Likewise, 34.5% of the nurses had knowledge that only hepatitis B vaccine series are recommended for unvaccinated nurses if source is HBsAg negative.

This study found working unit and working experience as influencing variable for nurses' level of knowledge on PEP for HBV. However, none of the study explored the association between level of knowledge regarding PEP for HBV with working unit and working experience of the nurses.

CONCLUSION

Based on the findings, it was concluded that nurses working in Chitwan Medical College Teaching Hospital have poor knowledge about PEP for HBV infection. Nurses' knowledge was poor on almost all knowledge items but more on risk percentage of getting infection and contact person for risk assessment after needle stick injuries, constituents of PEP for HBV, effective and ineffective time to start PEP and conditions for PEP treatment against HBV. In addition, working unit and working experience are the significant variables associated with the nurses' knowledge on PEP for HBV.

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