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Original Research Article

AWARENESS AND KNOWLEDGE OF VIRAL HEPATITIS PREVENTION AND TRANSMISSION IN HEALTHCARE WORKERS

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Abstract: *The objective of this study was to evaluate the knowledge and awareness of healthcare workers about the prevention and transmission of hepatitis B virus. The study was conducted in Nishtar Medical Hospital, Multan, from January 2023 to September 2023 and included 300 healthcare workers, such as doctors and nurses. The participants were asked to fill out a 50-question questionnaire designed to test their knowledge about hepatitis B. The questionnaire was in English, but assistance was provided if needed. The questions were related to the virus, behaviors, and medical practices when treating infected patients, and it took an average of 30 minutes to complete. The results showed that 74% of the healthcare workers knew the consequences and possible complications of acquiring HBV infection. Between 69% and 80% of the respondents answered correctly about the transmission routes. However, only 24% of the HCWs knew the age distribution of the infections and that neonates were at the highest risk of developing it through mother-to-child transmission. Respondents answered wrongly about transmission through food and cutlery with the infected (69%), through sneezing and coughing (81%), prevention of infection by thorough cleaning (50%), and not sharing food and cutlery with the infected (55%). Only half of the workers knew about disposing of needles and syringes correctly. The average knowledge score was 24 ± 5 with a median score of 24 (10-33). Respondents performed the worst when answering questions about CHB monitoring and treatment. In conclusion, this study found that the awareness and knowledge about hepatitis B prevention and transmission among healthcare workers in Pakistan is poor. Therefore, it is recommended to make training programs mandatory for professionals to improve disease management.*

Keywords: Hepatitis B, Health Care Workers, Prevention, Transmission

Introduction

Hepatitis B is a viral liver infection that is transmitted through blood and other body fluids and can lead to liver cancer, cirrhosis, and early death. Currently, an average of 257 million people are suffering from hepatitis B infection globally (Razavi-Shearer et al., 2018). Three-quarters of the infected people belong to the Asian and African demographic due to a lack of education and vaccine awareness (Childs et al., 2018). A total of 42% of deaths caused by liver cancer were accounted for by hepatitis B infection (Maucort-Boulch et al., 2018).

Pakistan has a high incidence of Hep B virus, with almost 7-9 million carriers of the disease (Mehmood et al., 2020). It has been estimated that in six years, nearly 3.25% of the country's population will report positive for the virus (Samo et al., 2021). Half a million people die from hep B annually, and this rate is increasing every year. Although the vaccination for hepatitis B was introduced in 2009 in Pakistan, the number of infected patients and mortality rate of hep B and its related complications has increased since the last decade. Mother-to-child transmission of the virus has been reported as the leading cause of chronic hepatitis B; neonatal vaccination within 24 hours of birth is recommended to mitigate the risk of transmission.

No nationwide plan for the prevention and elimination of viral hepatitis has been carried out in Pakistan to date, which indicates negligence towards the healthcare sector. However, healthcare workers are essential in-patient counseling and raising awareness. We conducted this study to evaluate the awareness and knowledge of healthcare workers regarding the prevention and transmission of the Hepatitis B virus.

Methodology

A cross-sectional study was conducted in Nishtar Medical Hospital, Multan, from January 2023 to September 2023. A total of 300 healthcare workers, including doctors and nurses, were included in the study. All participants provided their informed consent for the study. Those workers who did not consent to participate were excluded. The hospital's ethical board approved the study design.

The study participants were asked to complete a questionnaire to test the healthcare workers' knowledge. The language of the questionnaire was English, but assistance was provided in case of difficulty in comprehension. The questionnaire included 50 questions and took an average of 30 minutes. The majority of the questions (42) inquired about knowledge regarding the hepatitis B virus, three questions assessed their behaviors, and five questions were regarding medical practices when treating a patient infected with hepatitis B.

All the data was analyzed by STATA 12. Mean ±SD and median were used to express continuous data, and

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percentage was used to express categorical data. A knowledge score was given to each participant depending upon correct answers in the questionnaire. Univariate linear regression analysis was done to evaluate the relationship between the hepatitis B virus and patients' demographics, prior experience with the disease, and healthcare workers' training on the virus's management and treatment. Variables with a probability of more than 0.25 were analyzed in the multivariate analysis. 95% CI and regression coefficients were employed to establish an association between independent variables and outcome. Statistical significance was denoted by a probability value of 0.05 or more.

Results

The study analyzed 300 questionnaire responses. Most of the population (65%) were women, and 80 (60%) participants were 25-45 years old. 220 (73.3%) had previously treated a chronic hepatitis B patient, and 66.6% of the population was vaccinated. Almost half of the respondents, 41.6%, had attended hepatitis B training in the last two years. The patients' characteristics are shown in Table I.

Table II shows the frequency of correct responses to questions asked regarding hepatitis B. 222 (74%) were aware of the consequences of acquiring HBV infection and were aware of possible complications. 69-80% of the respondents responded correctly about transmission routes. However, only 24% of HCWs knew the correct age distribution of the infections and that neonates are at the highest risk of developing it through mother-to-child transmission. The majority of the correct answers were received when inquired about mother-to-child transmission (90%), unprotected sexual activity (85%), and transfusion (80%). Respondents answered wrongly about transmission through food and cutlery with the infected (69%), through sneezing and coughing (81%), prevention of infection by thorough cleaning (50%), and not sharing food and cutlery with the infected (55%). Only half of the workers knew about the correct disposal of needles and syringes.

A total of 183 (61%) wore gloves while injecting patients, and only 144 (48%) disposed of the needle correctly, which indicates a risk of needle stick injury in 52% of workers. 42% of workers reported non-availability or inadequate availability of newborn HBV vaccine. Only 22-27% of the workers were conscious of working with or sharing food with an infected patient (Table III).

The average knowledge score was 24 ± 5 with a median score of 24 (10-33). Respondents performed the worst when answering questions about CHB monitoring and treatment (Table IV).

Multivariate analysis revealed that physicians performed better than nurses and midwives. Not receiving hepatitis B training affected the knowledge score by 0.9 points. Age, sex, work experience, and department did not significantly affect the score. Similarly, being tested and vaccinated and having previous encounters with an infected were not related to increase knowledge scores (Table V).

Table I: Patients' demographics

	N (%)
Age	
< 25 years	51 (17%)
25-45 years	180 (60%)
45 years <	69 (23%)
Gender	
Men	105 (35%)
Women	195 (65%)
Profession	
Physician	150 (50%)
Nurse	75 (25%)
Midwives	75 (25%)
Department	
Pediatrics	78 (26%)
General medicine	75 (25%)
Internal medicine	57 (19%)
Obstetric	90 (30%)
Experience	
<5 years	90 (30%)
5-10 years	105 (35%)
Ten years or more	105 (35%)
Tested for HBV	245 (81.6%)
Hepatitis B vaccinated	200 (66.6%)
Encounter with a chronic HB patient	220 (73.3%)
HBV training within the last two years	125 (41.6%)

Table II: Correct responses regarding Hepatitis B prevalence, management, and prevention

Inquiry	**Correct responses N (%)**
HBV prevalence and risk	
Prevalence of Hepatitis B in Pakistan	123 (41%)

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Route of infection of HBV-infected	117 (39%)
Age distribution of infected	72 (24%)
Effect of chronic hepatitis B infection	222 (74%)
Transmission of virus	
Through handshake	264 (88%)
Through unprotected sexual activity	255 (85%)
Through blood transfusion	264 (88%)
Through sneezing or coughing	243 (81%)
Mother-to-child transmission	270 (90%)
Through sharing food or cutlery with an infected patient	207 (69%)
Prevention	
Through cleaning and cooking food	150 (50%)
Administration of vaccination to immunity-compromised people	273 (91%)
Disposing of used syringes and needles	276 (92%)
Not sharing food or cutlery with the infected person	165 (55%)
Use of condom	273 (91%)
Immunization	
Identification of vaccine recipients	219 (73%)
Administration of vaccine to newborn	267 (89%)
Safety of HBV vaccine	183 (61%)
Intervention for neonate born to a CHB mother	222 (74%)
Infection safety	
Washing hands after clinical procedure for prevention of needle stick injury	246 (82%)
Discarding needles properly for prevention of needle stick injury	150 (50%)
Not discarding the needle immediately to prevent needle stick injury	141 (47%)
HBV screening	
Of pregnant women with no symptoms	258 (86%)
Of HIV patients with no symptoms	243 (81%)
Of the family of CHB patients with no symptoms	270 (90%)
Tests performed for CHB confirmation	264 (88%)
Tests performed to confirm HBV immunity	111 (37%)
HBV monitoring	
Screening of CHB patients for liver cancer	39 (13%)
Performing alpha-fetoprotein test for liver cancer screening	165 (55%)
Performing alanine transaminase test for liver cancer screening	96 (32%)
Performing AST test for liver cancer screening	96 (32%)
Performing abdominal ultrasound for liver cancer screening	84 (28%)
Performing carcinoembryonic antigen test for liver cancer screening	78 (26%)
Performing alpha-fetoprotein test for liver damage monitoring	75 (25%)
Performing alanine transaminase test for liver damage monitoring	138 (46%)
Performing AST test for liver damage monitoring	60 (20%)
Performing abdominal ultrasound for liver cancer screening	78 (26%)
Treatment	
CHB symptoms	39 (13%)
Curing CHB	183 (61%)
Administration of antivirals to CHB patients	60 (20%)
Consequence of improper monitoring and treatment	66 (22%)

Table III: Medical practices of healthcare workers

	N (%)
Availability of newborn HBV vaccination	174 (58%)
Use of gloves while injecting patients	183 (61%)
Correct disposal of needles after injecting patients	144 (48%)
Needle stick injury in the last 12 months	72 (24%)
Availability of sharp-proof containers for disposing of syringes and needles	246 (82%)
Concerned with working with a CHB patient	81 (27%)
Concerned with sharing food with CHB patients	66 (22%)

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Table IV: HBV knowledge score

	Average score	Median score
Prevalence and risk	2.1 ± 0.9	2 (0-4)
Transmission	4.8 ± 1.5	5 (0-6)
Prevention	4.0 ± 1.3	4 (0-5)
Immunization	2.8 ± 0.9	3 (0-4)
Injection safety	2.0 ± 1.0	2 (0-3)
Testing	3.8 ± 1.5	4 (0-5)
CHB monitoring	2.9 ± 2.4	3 (0-8)
CHB treatment	1.6 ± 1.0	1 (0-4)
Total score	24 ± 5	24 (10-33)

Table V: Factors Influencing Knowledge Score

	Univariate analysis			Multivariate analysis		
	Coefficient	t	p	Adjusted coefficient	95% CI	p
Age						
Younger than 25 years	Reference	-	-	Reference	-	-
25-34 years	1.9	2.3	0.04	0.3	-2.0 to 2.2	0.90
35-45 years	1.8	2.2	0.05	-0.3	-2.8 to 2.6	0.90
Older than 45 years	1.20	1.5	0.20	-0.5	-3.0 to 2.5	0.79
Gender						
Men	Reference	-	-	Reference	-	-
Women	-0.4	-0.6	0.69			
Profession						
Physician	Reference	-	-	Reference	-	-
Nurse	-4.6	-3.8	<0.001	-4.8	-8.0 to 2.0	0.001
Midwives	-3.1	-4.1	<0.001	-3.2	-4.7 to -1.7	<0.001
Department						
Internal medicine	Reference	-	-	Reference	-	-
General medicine	-1.3	-1.5	0.20	-0.8	-2.6 to 1.5	0.50
Pediatrics	-0.5	-0.5	0.70	-0.8	-2.7 to 1.6	0.49
Obstetric	-1.1	-1.3	0.29	0.5	-1.7 to 2.2	0.80
Experience						
Less than five years	Reference	-	-	Reference	-	-
5-10 years	1.0	1.5	0.19	0.6	-0.8 to 1.5	0.58
Ten years or more	0.5	0.6	0.68	-0.08	-2.0 to 1.9	0.90
Not tested for HBV	-1.5	-2.0	0.10	-0.8	-2.5 to 0.5	0.09
Not hepatitis B vaccinated	-0.8	-2.1	0.70			
No encounter with a chronic HBI patient	-1.8	-3.0	0.008	-0.9	-2.5 to 0.8	0.059
No HBV training within the last two years	-0.8	-1.8	0.05	-0.9	-1.9 to -0.2	0.030

Discussion

Hepatitis B infection is a frequent and contagious condition in Pakistan. With the increasing incidence of HBV, health professionals need to be educated about the management and prevention of the disease. We conducted this study to assess healthcare workers' knowledge regarding the prevention and transmission of hepatitis B. However, the results revealed disappointing results. Out of 50, the average score was 24.

The professionals were not aware of the HBV prevalence (41%) and the primary cause of it being mother-to-child transmission (24%). 42% of respondents wrongly believed the direct transmission of CHB was through sexual activity. Only 24% knew about the high risk of CHB to the neonate. 69% thought the transmission was through sharing food and cutlery with the infected. The lack of awareness regarding the transmission of the disease may be a reason for the increased risk of CHB in neonates. Similar results were reported by other studies conducted among healthcare workers in Pakistan (Butt and Ahmed, 2018; Khan et al., 2019; Soomar et al., 2021).

Since mother-to-child transmission of chronic hepatitis B is high, it is essential to administer vaccination to the newborn at birth to prevent infection. Professionals handle 98% of births. Hence, they are responsible for the safety of infants

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against disease. Our study revealed the lack of knowledge of healthcare workers regarding the vaccine. Only 61% of workers could confirm the safety of the Hep B vaccine. This skepticism has also been noted in the general public, which is why most of the population is unvaccinated. However, in a study conducted in Punjab, pregnant mothers were aware and confident of the vaccination after female health workers and birth attendants gave information (Gul et al., 2022; Maqsood et al., 2021). The lack of acceptance of the hep B vaccine among healthcare workers may be due to wrong beliefs, attitudes, and practices at their institute (Akazong et al., 2020; Mursy and Mohamed, 2019; Qin et al., 2018). However, this behavior puts the infants at high risk of infection. Therefore, more research is needed to investigate these attitudes.

Not only the patients but healthcare workers are also at high risk of acquiring hep B infection, with the risk being multiplied by fourfold than for an average person (Shao et al., 2018). WHO reported a 5.9% prevalence of HBV among healthcare workers every year around the world (Prüss-Üstün et al., 2005). Although this frequency is lower in Pakistan, given the HBV antigen is 2.5%, this risk increases every year (Waheed et al., 2019). As noted in our study, the workers are at higher risk due to a lack of proper knowledge and employing necessary precautions for prevention. Poor vaccination coverage for health professionals and globally also contributes to that (Auta et al., 2018). In our study, 66.6% were vaccinated, which is consistent with other studies (Abidi et al., 2018; Basireddy et al., 2018). Compliance with injection safety protocols was also poor (48%), which is higher than reported in the literature (Musroor and Saleem, 2020) 61% reported wearing gloves while injection patients and 24% reported a needle stick injury in the last year, which is significantly lower than other studies (Abbas et al., 2023).

The lowest knowledge score was among the questions regarding CHB monitoring and treatment. Only 1-2% of the respondents could answer correctly to all questions about testing and screening for liver cancer and damage. Therefore, there is a need for frequent and mandatory CHB training for healthcare professionals to improve disease management and prevention.

Another factor worth mentioning is the lower scores of nurses and midwives than physicians. A strong association between the profession of the healthcare worker and knowledge score was reported in previous studies (Liu et al., 2018; Mustafa et al., 2018). In our study, the exposure to CHB patients in the past also influenced the score, and those professionals did not show improved results. However, another study noted contradictory results in which workers vaccinated and tested for hepatitis B had higher knowledge scores than those who were unvaccinated (Shrestha et al., 2020). In our study, the workers who had attended HBV training in the last two years had improved scores than others. This highlights the importance of training to enhance knowledge about hep B among healthcare workers.

49% of the respondents in our study were concerned about coming in contact with patients infected with CHB. This stigma among healthcare professionals can cause psychological strain on the patients. Another study also reported the unwillingness of nurses to deal with viral hepatitis patients (Ishimaru et al., 2017). This attitude is also reflected in public individuals who believe in the myth of hep B transmission through sharing food. Encouraging training and education among healthcare workers and the public can be an excellent start to improving knowledge.

Our study has some limitations. The study was single-centered; hence, the results cannot be representative of different regions and hospitals in the country. In addition, the responses were self-reported, so self-bias must be considered.

Conclusion

The awareness and knowledge about hepatitis B prevention and transmission among healthcare workers in Pakistan is poor. Training programs should be mandatory for professionals to improve the management of disease.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department Concerned.

Consent for publication
Approved

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Not applicable

Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

MUHAMMAD FARHAN JAMIL (Senior Demonstrator)
Manuscript revisions, critical input.
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Conception of Study, Development of Research Methodology Design, Study Design,, Review of manuscript, final approval of manuscript
Coordination of collaborative efforts.
NAWAL YOUSAF, SENIOR (Demonstrator)
Data entry and Data analysis, drafting article
HAFIZ DANISH ALI KHAN (House Officer)
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KHURRAM MALIK (Demonstrator)
Conception of Study, Development of Research Methodology Design, Study Design,, Review of manuscript, final approval of manuscript
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