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Research Article

TO STUDY NEEDLE STICK INJURY AND DETERMINE THE VACCINATION STATUS OF HEPATITIS B VIRUS IN HEALTHCARE PROFESSIONALS

Iqra Badar[1], Khadim Hussain[2], Rajesh Kumar[3], Mashooque Ali Dasti[4], Muhammad Aamer[5], Saleem Shahzad[6]

1. Consultant Physician Medicine, People's University of Medical and Health Sciences Nawabshah Pakistan. email: iqrabadar89@gmail.com (Corresponding author)
2. Assistant Professor Medicine, Bilawal Medical College Jamshoro, District Hospital Kotri Pakistan. email: hussain_khadim786@yahoo.com
3. Associate Professor Medicine, Shaheed Mohtrama Benazir Bhutto Medical College Lyari & Sindh Govt: Lyari General Hospital Karachi Pakistan. email: rajedr@gmail.com
4. Associate Professor Adult Cardiology, National Institute of Cardiovascular Diseases Sehwan Pakistan. email: dralidasti@gmail.com
5. Assistant Professor Nephrology, Shalamar Institute of Health Science Lahore Pakistan. email: dr_aamir187@yahoo.com
6. Associate Professor Medicine, Jinnah Post Graduate Medical Center Karachi Pakistan. email: drsaleemshahzad786@gmail.com

ABSTRACT

Background: A major public health concern all around the world include hepatitis B virus (HBV) infection. According to studies, there are approximately 360 million individuals who are at risk of getting hepatitis B virus or have chronic liver infection. Worldwide, approximately 37% of the health care workers (HCWs) have occupational HBV infection. This virus is mostly found in low and middle income countries. The healthcare workers have exposure to infected people's body fluids, blood, and contaminated medical supplies. There are a number of factors that affect the vaccination coverage among healthcare professionals. These factors include awareness, not trusting in vaccines, very less information, misinterpretation, cost, and vaccine availability.

Objective: To study needle stick injury and determine the vaccination status of Hepatitis B virus in healthcare professionals

Study design: A descriptive cross-sectional analysis

Duration and place of study: This study was conducted at People's University of Medical and Health Sciences Nawabshah from September 2024 to September 2025

Methodology: This research included different healthcare professionals such as paramedics, doctors, and janitorial staff. All the HCWs were those who joined the hospital at least one year back. All the healthcare workers were selected from different wards such as Emergency, Surgery, Urology, Nephrology, Medicine, Laboratory, and Gynaecology. There were a total of 200 people included in this study. The data was collected through a structured questionnaire which was selected from previous studies. The data that was collected was the following; exposure of needle stick injury in different wards, socio-demographic information, and vaccination status against HBV.

Results: There were a total of 200 healthcare workers included in this research. Most of the participants were males, representing 57% of the total population. A larger number of the HCWs were in the age group of 30-40 years. 66% of the total population had less than 10 years of experience. Only 24% of the HCWs were vaccinated, in which 138 were doctors and 62 were paramedics. A total of 32 females and 16 males were vaccinated.

Conclusion: The overall vaccination rate for HBV is low in healthcare professionals.

INTRODUCTION

A major public health concern all around the world include hepatitis B virus (HBV) infection [1]. According to studies, there are approximately 360 million individuals who are at risk of getting hepatitis B virus or have chronic liver infection [2]. Some recent studies found that around 2 billion individuals around the world have serologic evidence of hepatitis B infection [3]. Hepatitis B infection is prevalent in certain regions of Africa and Asia at around a rate of 20% of the total population [4]. In South Asia, the prevalence of HBV is around 8 percent in different age categories [5]. In

Pakistan, around 5% of the total country's population is infected by this virus. This makes up to 11 million people [6].

Worldwide, approximately 37% of the health care workers (HCWs) have occupational HBV infection [7]. This virus is mostly found in low and middle income countries. The healthcare workers have exposure to infected people's body fluids, blood, and contaminated medical supplies. This is the reason for 50% of the hepatitis B virus infection among HCWs [8]. Similarly, patients can also get exposed to the virus from the healthcare workers by the use of improperly sterilised medical tools. Moreover, just like this, newborns and infants can also be exposed to this virus.

Research says that approximately 95% of the infected children develop chronic hepatitis later in their lives [9]. In Pakistan's healthcare system, there are no specific regulations related to the vaccination of healthcare professionals against hepatitis B. Due to this effect on HCWs, there will be limited access to healthcare services in Pakistan [10]. This will also affect the integrity of the healthcare system. However, some studies have observed that private hospitals have made HBV vaccination a prerequisite for employment. In Pakistan, around 40% of the HCWs in public hospitals have received all three doses of the vaccination [11].

There are a number of factors that affect the vaccination coverage among healthcare professionals. These factors include awareness, not trusting in vaccines, very less information, misinterpretation, cost, and vaccine availability. Due to these risk factors, it is important to adopt safety protocols because it will reduce the development of the injuries and improve overall safety of the healthcare system. Therefore, this study was conducted to study needle stick injury and determine the vaccination status of Hepatitis B virus in healthcare professionals.

METHODOLOGY

This research included different healthcare professionals such as paramedics, doctors, and janitorial staff. All the HCWs were those who joined the hospital at least one year back. A simple random sampling method was used to select the target population. All the healthcare workers were selected from different wards such as Emergency, Surgery, Urology, Nephrology,

Medicine, Laboratory, and Gynaecology. There were a total of 200 people included in this study. All the HCWs who were involved in this study were informed about this study and their verbal consent was obtained. We got the approval from the Ethical Review Committee for this study.

The data was collected through a structured questionnaire which was selected from previous studies [12]. We modified the questionnaire according to our study and later asked the questions from the participants. The data that was collected was the following; exposure of needle stick injury in different wards, socio-demographic information, and vaccination status against HBV. Participants were not given access to the data set but they were assured that their data will remain confidential. It was a non-interventional and non-invasive study. Participants were at no physical risk and they were not given any direct benefit. However, this study will be beneficial to the community in the long run. SPSS-26 was used to analyse the data.

RESULTS

There were a total of 200 healthcare workers included in this research. Most of the participants were males, representing 57% of the total population. A larger number of the HCWs were in the age group of 30-40 years. 66% of the total population had less than 10 years of experience. The data of the socio-demographic variables is shown in table number 1.

Table No. 1:

Variables	N	%
Gender		
● **Female**	86	43.0
● **Male**	114	57.0
Age Group (yrs)		
● **Less than 30**	68	34.0

• **30 to 40**	102	51.0
• **More than 40**	30	15.0
Profession		
• **Paramedics**	104	52.0
• **Doctors**	78	39.0
• **Janitorial staff**	18	9.0
Working Experience (yrs)		
• **Less than 10**	132	66.0
• **10 to 20**	34	17.0
• **More than 20**	34	17.0
Wards		
• **Surgery Ward**	20	10.0
• **Nephrology & Urology**	9	4.5
• **Medical ward**	66	33.0
• **Pediatric ward**	38	19.0
• **Obs/Gynae**	22	11.0
• **Laboratory**	14	7.0
• **Emergency room**	31	15.5

Vaccination status and data related to needle stick injury is shown in table number 2.

Table No. 2:

Variables	N	%
HBV Vaccination		
• **No**	152	76.0
• **Yes**	48	24.0
HBV Vaccination status in HCWs		
• **Paramedics**	62	31.0
• **Doctors**	138	69.0
• **Janitorial staff**	0	0.0
Needle Stick Injury Exposure		
• **None**	30	15.0
• **One time**	68	34.0
• **More than one**	102	51.0
One Time Needle Stick Injury		
• **Paramedics**	82	41.0
• **Doctors**	78	39.0
• **Janitorial staff**	60	20

Multiple Times Needle Stick Injury		
• **Paramedics**	108	54.0
• **Doctors**	38	19.0
• **Janitorial staff**	54	27

Table number 3 shows the factors linked with HBV vaccination among the study population.

Table No. 3:

Variables	**Vaccinated (n=48)**		**Non-vaccinated (n=152)**	
	N	**%**	**N**	**%**
Gender				
• **Female**	32	66.7	54	35.5
• **Male**	16	33.3	98	64.5
Age Group (yrs)				
• **Less than 30**	25	52.1	43	28.3
• **30 to 40**	14	29.1	88	57.8
• **More than 40**	9	18.8	21	13.9
Profession				
• **Paramedics**	14	29.2	90	59.2
• **Doctors**	34	70.8	44	28.9

• **Janitorial staff**	0	0.0	18	11.9

DISCUSSION

In our study, we found that a total of 24% healthcare professionals have obtained hepatitis B vaccination. Similar results were observed in a study by Yuan Q et al. that the HBV vaccination coverage was low in developing countries (11.3%) [13]. According to the study of Chang Hun Lee et al., there is a lower HBV vaccination rate [14]. This study suggests that there should be a focus on increasing awareness of vaccinations. However, studies which were conducted in well developed regions such as Europe and North America, there was a higher HBV vaccination rate observed [15]. According to the study of Salman et al., there were improved outcomes discovered [16].

Our study shows that doctors had the highest rate of HBV vaccination, representing 69% of the total population. After doctors, paramedics also have a good percentage for vaccination (31%). Our study also observed that the janitorial staff was totally non-vaccinated. This means that there is a need for awareness and access to vaccination. These results are similar to a study which found that janitorial staff and paramedics mostly have a very low vaccination rate due to lack of awareness and misunderstandings [17].

Our study revealed that 34% of the total population experience a single exposure to needle stick injury while 51% experience multiple needle stick injuries. 15% had no exposure to needle stick injury. This suggests that a higher number of healthcare professionals can get HBV exposure because of unsafe practices. These results are similar to the study of Najma et al. who revealed that needle stick injuries can be a prevalent occupational hazard [18].

Our study also revealed that age was an important factor influencing vaccination status. Participants who were aged from 30 years to 40 years had higher vaccination rates (51%) as compared to those who were less than 30 years or more than 40 years (15%). Moreover, our study also revealed that females are more likely to be vaccinated

as compared to males. The vaccination rate in females was 66.7%. This is similar to other studies as well [19,20].

CONCLUSION

The overall vaccination rate for HBV is low in healthcare professionals.

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This study was conducted without receiving financial support from any external source.

Conflict in the interest

The authors had no conflict related to the interest in the execution of this study.

Permission

Prior to initiating the study, approval from the ethical committee was obtained to ensure adherence to ethical standards and guidelines.

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