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HEPATITIS B VACCINATION COVERAGE AND IMMUNIZATION STATUS AMONG HEALTH CARE WORKERS IN PUNJAB AND ISLAMABAD, PAKISTAN

Turab Fatima Abidi[1], Syeda Javeria Ahsan[1], Nida Fatima[1]

Authors

Emergency Medicine Dept. Pakistan Ordnance Factories Hospital, Wah Cantt[1].

Correspondence to

Syeda Javeria Ahsan
Emergency Medicine Dept. Pakistan Ordnance Factories Hospital, Wah Cantt
jiya.jia@gmail.com

ABSTRACT

INTRODUCTION

Hepatitis B (HBV) is an occupational risk factor for Health Care Practitioners (HCPs). HBV vaccine has been recommended since 1982 for use by HCPs to prevent HBV infection. The aim of this study was to evaluate the vaccination coverage and post vaccination immunization status among HCPs and their beliefs regarding HBV vaccine.

MATERIALS AND METHODS

This cross sectional, questionnaire based, descriptive study was carried out in four tertiary care hospitals (POF Hospital, Shifa International Hospital, RMC allied Hospitals and Mayo Hospital) of Pakistan.

RESULTS

After obtaining informed consent, a total of 300 participants were provided with questionnaire out of which 276 participants responded. There were 169 doctors (61.2%) and 107 registered nurses (38.8%). 59.4% participants were fully vaccinated, 15.2% had received 2 doses of vaccine, 9.1% received only one dose and 16.3% were unvaccinated. Out of fully vaccinated HCPs, 52.1% had checked their immunization status and 92% of them were immunized according to their antibody titres. Beliefs regarding effectiveness of HBV vaccine and its safety among HCPs were 98.6% and 92% respectively.

CONCLUSION

The vaccination coverage of HBV and confirmation of post vaccination immunity status is low among health care workers of Punjab, Pakistan. Further studies should be done to establish reasons for this low vaccination coverage and to ensure adequate antibody titres. Health policies should also be revised to make it mandatory for all health care professionals to be immunized before dealing with patients.

KEY WORDS

HBV vaccination, antibody titre, Pakistan

INTRODUCTION

Hepatitis B infection is caused by Hepatitis B virus which is transmitted via exposure to infected blood and body fluids.[1] The risk of contracting hepatitis B infection, as proven by serology, is 32-67% on exposure to HBsAg and HBeAg positive blood while it reduces to 23-37% on exposure to HBsAg positive blood which is HBeAg negative.[2-3] Hence it has been recognized as an occupational risk for health care practitioners (HCP) due to their exposure prone nature of work.HCP is defined as any paid or unpaid person working in health care settings who has the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.[4] Occupational exposure via percutaneous injuries is a well known risk factor for hepatitis B transmission.[5]

On the other hand, infected HCPs also pose a risk for transmission of virus to the patients.[6] A vaccine was introduced in 1981 in U.S for prophylaxis against hepatitis B and was recommended by Advisory Committee on Immunization Practices (ACIP) for use by HCPs in 1982[7] which led to a decrease in prevalence of Hepatitis B among health care workers from 18% in 1975-76[8,9] to 6.2% in 1991.[10]

Later multiple studies were conducted to evaluate percentages of vaccination coverage among HCPs. Ogoina D. et al. showed that 36.2% HCPs were fully vaccinated in Nigeria[11] while this percentage was 49.6% in Rajasthan India[12], 56.5% in Greece[13], 75% in U.S[14] and 93% in Paris[15]. In a study done during 2012 in Ethiopia, the vaccination

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coverage was found to be alarmingly low i.e. 5.4%.[16]

Although the prevalence of Hepatitis B has decreased after the introduction of vaccine since 1980s[1] but still Pakistan remains among the countries of intermediate prevalence for Hepatitis B i.e. 2%-7%.[17,18] The prevalence is much higher in health care workers of Pakistan. Studies have shown that prevalence of Hepatitis B among health care practitioners varies between 3.25(±1.2%).[19] As vaccination and observation of standard precautions remain the main elements of prevention against hepatitis B, studies were conducted in past to evaluate the vaccination coverage among health care workers in different areas of Pakistan.[19, 20]

Nasir K. in a single center study reported vaccination coverage of 49% among HCW and 42.20% among medical students in Lahore during 1998.[21] Yousufzai MT. showed 40% prevalence of vaccination in Rural North West Pakistan in 2010.[22] Ataullah S. showed a prevalence of vaccination among HCP in Peshawar to be 73.42%.[23] 28% Doctors, 20% nurses, 64% Operation Theatre and 68% Lab technicians were found fully immunized in a study conducted during 2013-14 at tertiary care hospital in Karachi.[24] In 2009 a study was conducted in Multan which showed that 62.07% of HCPs were fully vaccinated, 12.64% were partially vaccinated and 25.29% HCPs were not vaccinated against hepatitis B.[20] Reasons of non vaccination included lack of time and awareness, forgetting schedules and negligence.[20]

It is recommended in CDC guidelines 2012 that all health care workers should be aware of their immunization status against hepatitis B after receiving full vaccination and should be revaccinated if proper immunity has not been attained.[8, 25] 65% of fully vaccinated HCWs were aware of their immunization status in Paris15 while a study conducted by Noman Arif in Multan showed that only 12.64% of fully vaccinated individuals had checked their post vaccination antibody titres.[20]

Although numerous single centre studies have been conducted in the past to evaluate vaccination coverage against Hepatitis B among HCWs in Pakistan, not a single multi-centre study has been conducted in Punjab, the most populated province of Pakistan. The main objective of this study was to evaluate the vaccination coverage and confirmation of post vaccination immunity status in multiple centers of Punjab and Islamabad capital territory.

MATERIALS AND METHODS

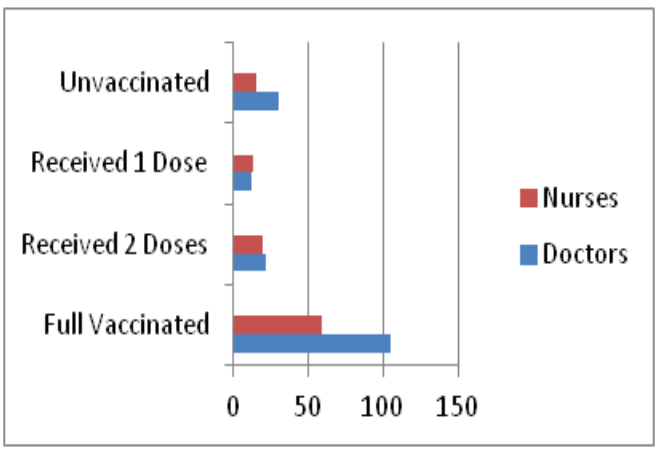
To analyze the vaccination status among health care workers, this cross sectional descriptive study was carried out in 4 tertiary care hospitals of Pakistan i.e. Pakistan Ordinance Factory (POF) Hospital, Wah, Rawalpindi Medical College allied hospitals, Rawalpindi, Mayo Hospital, Lahore and Shifa International Hospital, Islamabad. After obtaining informed consent, three hundred participants were enrolled in the study through convenience sampling. Questionnaire was explained and participants were ensured regarding the confidentiality of information obtained in the questionnaire. The study was approved by ethical committee of POF Hospital, Wah Cantt.

A standardized questionnaire which included the demographic details and questions regarding vaccination and post vaccination immunity status against hepatitis B was distributed among the participants. Attitude of participants towards Hepatitis B vaccine was assessed by asking about their beliefs regarding effectiveness and safety of the vaccine. Out of 300 distributed questionnaires, 276 were returned with a response rate of 92%.

Participants were categorized into fully vaccinated (who had received 3 doses of HBV vaccination at 0, 1 and 6 months), partially vaccinated (who had received one or two doses of vaccine) and non vaccinated (who had not received any dose of vaccine). Those who were fully vaccinated were asked about their immunization status and categorized accordingly.

All statistical analysis was carried out using SPSS for Windows version 17.0, Chicago. Frequencies and percentages were calculated and results were presented in tabulated form.

FIGURE 1: Bar Chart illustrating vaccination coverage among Doctors and Nurses (n=276)



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RESULTS

Among the selected participants, 40.6% were males and 59.4% were females. Mean age among participants was 26.8±4.3Yrs. Out of 276 HCPs, 61.2% (169) were doctors and 38.8% (107) were registered nurses. Among all participants 59.4% were fully vaccinated, 15.2% had received 2 doses of vaccine, 9.1% received only one dose and 16.3% were unvaccinated.

Among the 169 doctors, 62.1% were fully vaccinated, 20.1% were partially vaccinated and 17.7% were unvaccinated. While of the 107 nurses, 55.1% were fully vaccinated, 30.7% were partially vaccinated and 14% were unvaccinated. The main reason identified during this survey for for partial/no vaccination was lack of time (44.6%). Details are mentioned in Table 1

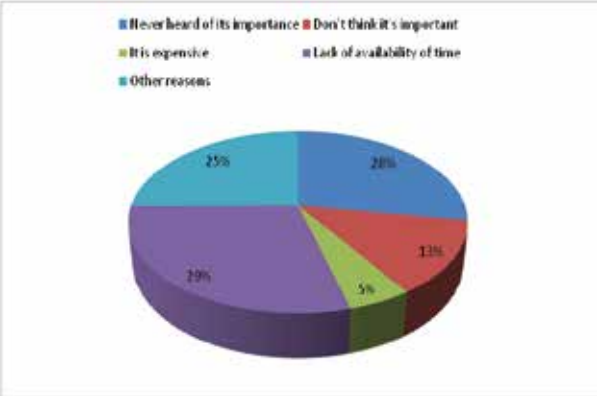
TABLE 1 – Reasons of partial or no vaccination among HCPs

Reason of Partial or No vaccination	Frequency	%age
Never heard about vaccine	2	1.8
Unavailability of vaccine at work place	9	8.0
Not been offered a chance for vaccination	19	17.0
Unavailability of time due to busy schedule	50	44.6
Prefer following universal precautions, so there is no need of vaccination	15	13.4
Not enough knowledge regarding vaccination	11	9.8
Can't afford HBV vaccine	1	0.9
Already infected with hepatitis B	2	1.8
Undergoing Screening for HBSAg	3	2.7
Total	112	100

Among fully vaccinated individuals, 52.1% had checked their immunity status and 92% of them adequate antibody titres while 8% did not have a sufficient response to the vaccine. 47.3% of fully vaccinated individuals did not check their immunity status and the main reasons for not getting tested for adequate antibody response were mostly lack of time (28.9%) and lack of knowledge about the importance of checking the antibody titre (27.6%) as shown in Figure 2

Almost 98.6% of Health care workers believed in the effectiveness of HBV Vaccine against hepatitis B prevention whereas 1.4% were unable to decide whether the vaccine was effective or not. Accordingly 92% participants agreed about the safety of vaccine, 7.6% of participants were not sure regarding the safety of vaccine and

FIGURE 2: Pie chart showing reasons for not checking antibody titre



0.4% believed that vaccine is not safe. An overwhelming majority of 99.3% thought that vaccine should be compulsory for healthcare workers while 0.7% were unable to decide.

DISCUSSION

Primary prevention is an effective means of improved healthcare. Immunization programs against hepatitis B have effectively controlled the transmission of virus thus reducing incidence of disease. Hepatitis B Virus is transmitted via exposure to body fluids and is considered to be an occupational hazard among health care professionals. Since 1982, when HBV vaccine was recommended for health care workers by ACIP, prevalence of HBV infection has reduced among health care workers. In emergency departments, where most of the patients are unknown to the practicing doctors and nurses, HBV vaccination must be mandatory to prevent from this health risk.

In present study, 300 participants were approached for survey out of which 276 responded. Thus total response rate was 92% which was lower than a study conducted in MirPur Khas where response rate was 95% [26] but more than that of studies conducted in Brazil, Islamabad and Multan where response rates were78.7% [27], 85%[28] and 87%[20] respectively. In our study, 59.4% of the respondents were fully vaccinated, 15.2% had received two doses of vaccine, 9.1% received only one dose and 16.3% were unvaccinated. This is in contrast to a study conducted in Islamabad Medical and Dental College where 33% of HCW were fully vaccinated, 73% were partially vaccinated and 40% were unvaccinated.[28] The difference in results can be due to selection of only one centre for study and inclusion of only medical students who might have lesser knowledge and concern regarding HBV vaccination due to lack of occupational exposure.

In a study conducted in Multan, 62.07% of the health care

workers were fully vaccinated, 12.64% were partially vaccinated while 25.29% were not vaccinated against hepatitis B while in Peshawar 73.42% HCWs were found to be fully vaccinated against hepatitis B in a study during 2013-14.[20, 23] In studies conducted in MirPur Khas[26], NorthWest Pakistan[22], Hyderabad[29] and Karachi[21] 57%, 40%, 45% and 64.6% HCWs were fully vaccinated respectively.

Thus, the current study showed around 59.4% of vaccination coverage which is better than most parts of the country but still is too low to be acceptable as it poses risk for both the patient and the professional.

In our study there was no statistically significant difference in vaccination coverage among doctors and nurses i.e. 62.1% doctors and 55.1% nurses. While in studies conducted in Northwest Pakistan[22] , Peshawar[23] and Rajasthan, India[12] higher rates of vaccination status were observed in doctors. Awareness programs regarding importance of vaccination against hepatitis B for nurses and hepatitis B vaccination as a mandatory requirement before initiation of job in health care centers are some of the factors which might have influenced the outcome in our study. No statistical difference was observed in vaccination status among males and females (p value >0.05).

This is in contrast to study conducted in IMDC where the difference of vaccination status among males and females was statistically significant.[28]

The most common reason of not receiving vaccine against hepatitis B in our study was lack of time due to busy schedules and overwork (44.6%). Other reasons were preference towards standard precautions, unavailability of vaccine at workplace and costly vaccine. In a study, it was shown that health care professionals usually neglect their own health due to various workplace and personal commitments.[30] Provision of vaccination, routine measurement of antibody titres and screening for Hepatitis B should be mandatory for all healthcare professionals.

In current study, 52.1% of the fully vaccinated HCWs were aware of their immunization status according to antibody titres and 92% among them were fully immunized whle 8% were not immunized thus requiring a booster dose of hepatitis B vaccination. This is in contrast to studies conducted in Multan and NICH, Karachi where only 12.64% and 13.2% of participants checked their immunization status after vaccination.[20] It is recommended that all HCWs should check their immunity status. An objective assessment of the antibody titres would have given more information regarding the current immunity of the participants.

HCWs performing Exposure Prone Procedures (EPP), procedures that might involve transmission of blood borne virus from a healthcare professional to a patient, should have an antiHBS level >100IU/L.20 If levels are between 10-100 IU/L, additional booster should be given and response should be reconfirmed. In HCWs who don't perform EPPs, antiHBS levels of >100 are desirable and if response is 10-100 IU/L response should be reconfirmed but for levels <10 IU/L additional booster should be given.[28]

In our study 47.9% of the fully vaccinated participants did not check their immunity status. Main reason of not checking immunization status was found to be lack of time (28.9%) and lack of knowledge regarding importance of checking post vaccination immunity status (27.6%). Other reasons also included high prices of the antibody titre.

Initially plasma derived vaccine was being used against Hepatitis B and it was considered unsafe but currently it is being genetically engineered.[31] The gene is being inserted in yeast cells which multiply during fermentation and produce excess immunogenic surface antigen which is then separated and purified. This vaccine might have minor side effects like redness at site of injection, headache, fever, and rash.[31] Nearly all participants of our study believed in the effectiveness and safety of Hepatitis B vaccine i.e. 98.6% and 92% respectively. According to 99.3% of the participants, vaccine should be made compulsory for all health care workers

CONCLUSION

The current study found that vaccination coverage among health care professionals was alarmingly low along with lesser percentage of post vaccination immunity checks despite the positive attitude towards effectiveness of vaccine. Therefore HCPs are at an increased risk of acquiring hepatitis B infection. We propose that a nation-wide health policy should be made for mandatory vaccination for HBV for every healthcare professional, specially for those working in emergency departments and high risk patient care areas, so that this occupational health risk is minimized.

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