

# Knowledge about Post-exposure Prophylaxis for Hepatitis B Virus among Dentists and Dental Students in Pakistan

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**Abstract**

**Objectives:** The aim of this study was to assess dentists and dental students' knowledge about post-exposure prophylaxis for Hepatitis B virus and to compare the results obtained from both the groups.

**Methods:** A cross-sectional study was conducted in September 2013 using a self-structured questionnaire to collect information from the six dental institutes in Lahore, Pakistan.

**Results:** A total number of 610 questionnaires were distributed and 593 were received with a response rate of 97 %. Out of 593 participants 162 (27 %) of the respondents were Dentists and 431 (73%) were dental students. Mean knowledge score for dentists and dental students was 5.51 and 5.69 respectively (score range 0-12). The comparison of knowledge between Dentists and Dental students, according to the scoring criteria, was statistically significant (p-value: 0.016) with Dental students being more knowledgeable than Dentists.

**Conclusion:** Based on the results of this survey, authors concluded that there is lack of knowledge about HBV post-exposure prophylaxis among Dentists and Dental students. Authors recommended that in all the Dental Institutes of Pakistan, Infection Control

Committees should be formulated and given the responsibility of conducting educational workshops with special emphasis on the HBV post-exposure prophylactic management. Participation in such workshops must be made mandatory for all Dental health care providers.

**Keywords:** Hepatitis B virus, post-exposure prophylaxis, Dentists, Pakistan.

**Introduction**

Healthcare workers are exposed to a number of occupational hazards with exposure to blood borne viral pathogens (Hepatitis B virus, Hepatitis C virus and HIV) being commonly encountered and a lack of awareness about such occupational risks make them more vulnerable to injuries.<sup>1</sup> Hepatitis B virus is present in saliva as well as blood and is of major concern in the dental office.<sup>2</sup> Acute Hepatitis B infection causes liver inflammation, jaundice, vomiting and rarely death whereas chronic form of the infection is potentially life-threatening as it may develop into liver cirrhosis over a period of several years and it dramatically increases the incidence of hepatocellular carcinoma (liver cancer).<sup>3,4</sup> According to a WHO report in July 2014, an estimated 240 million people have chronic infection and more than 780 000 people are dying every year because of acute or chronic consequences of the hepatitis B infection.<sup>5</sup> According to a study published in 2011, healthcare professionals and general population in some areas of Pakistan have very high HBV prevalence of more than 5% and there is an urgent need of mass vaccination and awareness programs.<sup>6</sup>

A safe and effective vaccine for the prevention of hepatitis B infection is available and protective response to the vaccine is defined as an anti-Hepatitis B surface antibody (anti-HBs) concentration of at least 10 mIU/ml in the recipient's serum.<sup>7,8</sup> However, the percentage of recipients who respond to each dose of hepatitis B vaccine varies by age. After age 40 years, approximately 90% of the recipients respond to a three-dose series, and by 60 years, only 75% of recipients develop protective antibody titers.<sup>8</sup> Prompt and appropriate post-exposure prophylaxis (PEP) is

effective in preventing transmission of HBV after an exposure.<sup>9</sup>

This study was therefore conducted to assess the extent of awareness regarding post-exposure prophylaxis for HBV among dentists and dental students. Currently, very few studies have been conducted in Pakistan pertaining to the awareness amongst dentists and dental students about cross infection control practices like post-exposure prophylaxis.

Thus the aim of this study was to bring to light this ongoing worldwide problem within the dental teaching hospitals in Pakistan.

## Methods

This cross-sectional study was conducted in September 2013, in the second largest city of Pakistan, Lahore. Permission to conduct the study was obtained through the Ethics and Research Committee of the Institute of Dentistry, CMH Lahore Medical College. One public sector and five private sector dental colleges were randomly selected for this study. Data reported in this article was collected using a self-structured questionnaire. Anonymity of the respondents was assured and verbal consent was obtained from each individual respondent. Two researchers were present at the time of distribution of the questionnaire to address any queries raised by the respondents.

A total number of 593 respondents, from six dental colleges, participated in the study and were categorized into two main groups: Group I consisted of Dentists (Faculty members and Postgraduate residents). Group 2 consisted of 3rd year students, 4th year undergraduate dental students and House officers' i.e. recent graduates enrolled in their one year pre-registration internship. The questionnaire comprised of three sections. The first section consisted of demographic characteristics (age, gender, designation). The Second section contained twelve knowledge based questions on post-exposure prophylaxis for hepatitis B virus. In the third section respondents were asked about their current vaccination status against Hepatitis B virus. Correct and incorrect answers were decided according to the current CDC

(Centre of Disease Control and Prevention) guidelines on post-exposure prophylaxis for Hepatitis B virus. Each correct answer was given a score 1 and each incorrect answer was scored 0. The response 'Don't know' was also given a score of 0. So the total score range for the section on PEP was 0 to 12. A scoring system based on 5-point Likert scale was designed to categorize the scores to assess the knowledge about post-exposure prophylaxis. (See Table 1) Statistical analysis was performed using the IBM SPSS software version 17 (Chicago Illinois). Analysis was performed using frequency, chi-square and t-test. A p-value of 0.05 or less was considered statistically significant.

## Results

A total of 610 questionnaires were distributed and 593 received with a response rate of 97 %. Out of these 593 respondents, 70% were female and 30% were male, with a mean age of 24.83. (SD 4.794). Additionally, of the 593 respondents, 162 (27.31 %) were Dentists and 431 (73 %) were Dental Students. To evaluate the respondent's knowledge of PEP, 12 questions were asked from which a mean correct response of 5.65 per respondent was obtained. The comparison of knowledge between Dentists and Dental students, according to the scoring criteria designed, showed that only 46 (28.4%) dentists had above average knowledge while the number of dental students with above average knowledge came out to be 149(34.6%) . And this comparison was statistically significant with the p-value of 0.016. These results are visually described in Figure.1.

When asked about their vaccination status, 13.8% of the respondents were not vaccinated and 5.2 % respondents could not recall whether or not they were vaccinated. When asked about the constituents of post exposure prophylaxis, only 9.4 % of the respondents knew the correct constituents of PEP i.e. both hepatitis B vaccine and hepatitis B immunoglobulin. Amongst the 90.6 % who answered incorrectly, 28 % of the respondents considered 'interferon therapy' as part of PEP for HBV (See Table 2).

Fig. 1: Comparison of Knowledge between Dentists and Dental Students. According to the Scoring System.

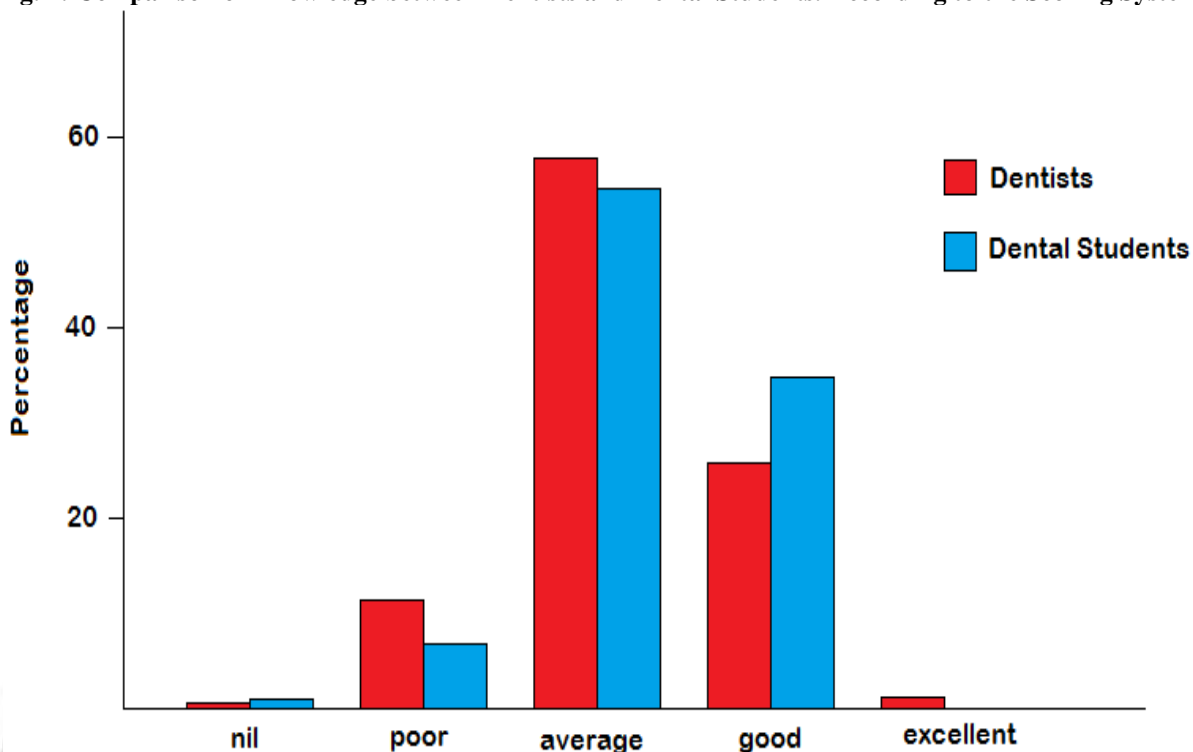


Table 1: Scoring System; to categorize study participants' knowledge

No. of Correct Answers (out of 12 Questions)	Category
0	Nil
1-3	Poor
4-6	Average
7-9	Good
10-12	Excellent

Table 2. Questions and Responses of Study participants, by groups and total.

Questions	Answers	Group.1 Dentists N (%)	Group.2 Dental Students N (%)	Total N (%)
What are the constituents of post-exposure prophylaxis for HBV?	a. HBIG	73 (12.3%)	167(28.2%)	240(40.5%)
	b. Hepatitis B vaccine	20 (3.37%)	73(12.33%)	93 (15.7%)
	c. Interferon	43 (7.25%)	122(20.5%)	165(27.8%)
	d. Anti-retroviral drugs	14 (2.36%)	24 (4.04%)	38 (6.4%)
	e. Both HBIG and vaccine	12 (2.02%)	45 (7.58%)	57 (9.6%)
Which serum antigens levels should be tested after an exposure to blood infected with HBV	a. HBsAg	115(19.4%)	275(46.4%)	390(65.8%)
	b. HBeAg	20 (3.37%)	47 (7.93%)	67 (11.3%)
	c. HBcAg	11 (1.85%)	46 (7.75%)	57 (9.6%)
	d. Don't know	17 (2.87%)	63 (10.4%)	79 (13.3%)

Can PEP prevent HBV infection after an occupational exposure?	a. Yes b. No c. Don't know	107 (18%) 30 (5.05%) 25(4.21%)	268(44.9%) 83(14.05%) 80(13.49%)	375(62.9%) 113(19.1%) 105(17.7%)
Best time to initiate PEP for HBV is within 24 hours of the exposure but no later than 7 days?	a. Strongly agree b. Agree c. Neutral d. Disagree e. Strongly disagree	57 (9.6%) 56 (9.4%) 33 (5.56%) 16 (2.69%) 0 (0%)	144(24.3%) 183(30.8%) 77 (13.0%) 18 (3.01%) 9 (1.5%)	201(33.9%) 239(40.3%) 110(18.6%) 34 (5.7%) 9 (1.5%)
Testing for HBsAg is necessary, if the exposed person is vaccinated and a known responder?	a. Yes b. No c. Don't know	88 (14.8%) 42 (7.08%) 32 (5.4%)	263(44.4%) 73(12.32%) 95 (16%)	351(59.2%) 115(19.4%) 127(21.4%)
What is the minimum level of anti-Hbs antibodies which can prevent the progression of HBV infection.?	a. 0.1mU/ml b. 1 mIU/ml c. 10 mIU/ml d. Don't know	13 (2.1%) 28 (4.72%) 35 (5.9%) 86 (14.5%)	67 (11.4%) 77(12.98%) 67 (11.3%) 220(37.1%)	80 (13.5%) 105(17.7%) 102(17.2%) 306(51.6%)
If a vaccinated dentist is a known responder to the vaccine, should he take prophylactic measure after an exposure?	a. Yes b. No c. Don't know	39 (6.6%) 42 (7.08%) 31 (5.22%)	281(55.5%) 81(13.66%) 69(11.68%)	368(62.1%) 123(20.7%) 100(16.9%)
What is the recommended PEP for an un-vaccinated dentist if source is HBsAg positive?	a. Hepatitis B vaccine series b. HBIG and vaccine series c. Interferon therapy d. Antiretroviral drug therapy e. No treatment f. Don't know.	56 (9.44%) 22 (3.7%) 18 (3.03%) 19 (3.2%) 22 (3.7%) 25 (4.2%)	149(25.16) 91 (15.3%) 45 (7.57%) 31 (5.2%) 32 (5.5%) 83 (14%)	205(34.6%) 113 (19%) 63 (10.6%) 50 (8.4%) 54 (9.2%) 108(18.2%)
What is the recommended PEP for an un-vaccinated dentist if source is HBsAg negative?	a. Hepatitis B vaccine series b. HBIG and vaccine series c. Interferon therapy d. Antiretroviral drug therapy e. No treatment f. Don't know.	12 (2.02%) 76 (12.8%) 26 (4.38%) 17 (2.86%) 3 (0.5%) 28 (4.72%)	40 (6.78%) 219(36.9%) 50 (8.42%) 37 (6.34%) 5 (0.84%) 80(13.48%)	52 (8.8%) 295(49.7%) 76 (12.8%) 54 (9.2%) 8 (1.34%) 108(18.2%)
Do you think one needs to start PEP on every subsequent exposure?	a. Yes b. No c. Don't know	69 (11.6%) 74(12.47%) 20 (3.37%)	204(34.5%) 174(29.3%) 52 (8.73%)	273(46.1%) 248(41.8%) 72 (12.1%)
Do you think PEP for a vaccinated and a non-vaccinated dentist is same?	a. Yes b. No c. Don't know	40 (6.74%) 98 (16.5%) 25 (4.2%)	65 (10.9%) 329(55.5%) 37 (6.1%)	105(17.7%) 427 (72%) 61 (10.3%)

\* HBV=Hepatitis B virus, \*PEP=Post exposure prophylaxis, \*HBIG=Hepatitis B immunoglobulin,



## Discussion

In countries like Pakistan, where prevalence of blood borne pathogen HBV is very high, Dentists and Dental students are at great risk of acquiring hepatitis B virus infection after an occupational exposure from a Hepatitis B positive patient.<sup>10</sup> We conducted this study to evaluate the Dentists and Dental students level of knowledge about the immediate prophylactic measures that should be taken to prevent the spread of Hepatitis B virus infection.

To our knowledge this is the first study conducted in Pakistan solely focused on the topic of post exposure prophylaxis. The response rate of the study was excellent i.e. 97%. Our findings suggest that, among our study population the level of knowledge about PEP for HBV is not very encouraging. Mean knowledge score for dentists and dental students was 5.51 and 5.69 respectively (score range 0-12). According to current CDC guidelines on PEP, our study revealed that the respondents have very limited knowledge about the correct constituents of post-exposure prophylaxis i.e. HBIG and Hepatitis B vaccine. Misconceptions regarding the constituents are prevalent among them. 27.8% of the respondents consider Interferon therapy, a drug with several side effects, as part of the post exposure prophylactic drug regimen for HBV (See Table 2). In our study, 34.6% and 49.7% of the respondents knew the correct recommended drug regimen for PEP for HBsAg positive and negative source patient respectively. These results are not encouraging and suggest that both dentists and dental students solely have to rely on the immediate medical assistance from a medical practitioner in case of an occupational exposure at their workplace.

Even though in Pakistan, the vaccine for hepatitis B virus is available for almost 20 years and is incorporated in Expanded Programme on immunization (EPI) since 2002<sup>12</sup>, our study revealed that 13.8% of the respondents are not vaccinated and surprisingly 5.2% respondents could not recall whether or not they were vaccinated. This implies that despite taking all the recommended preventive measures, sometimes, it is inevitable to escape occupational injuries in a dental setting and it is not practical to claim that transmission of hepatitis B virus from one person to another is impossible in a dental setting. But this spread of Hepatitis B infection can be minimally reduced if a Dentist follows the recommended post exposure prophylactic measures immediately. As this study was questionnaire based therefore accuracy of the results obtained depends on the participant's reliability, memory and honesty. Moreover, our findings about the vaccination status of the participants would be more accurate if we could evaluate their immunization status using serological testing.

## Conclusion

Based on the results of this study the overall knowledge about post-exposure prophylactic management for HBV among Dentists and Dental students is not satisfactory. This lack of knowledge highlights the fact that Dental health care providers are vulnerable to diseases and additional education is required in this regard. We highly recommend that in all the Dental Institutes of Pakistan, Infection Control Committees should be formulated and given the responsibility of conducting educational programs with special emphasis on the HBV post-exposure prophylactic management. Participation in the educational programs must be made mandatory for all dental health care providers. Such committees should also be made responsible for provision of lab testing facility, immediate availability of the PEP drug regime and monitoring of the HBV vaccination status of Dentists and Dental Students. Implementation of the above mentioned recommendations can prevent the Dentists and Dental students from getting infected by blood borne pathogens like HBV, ensuring a safe and healthy workplace for Dental health care providers.

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