

Knowledge of Hepatitis B Infection among Dental Students and Dental Professionals

Kulsoom Fatima Rizvi¹, Hira Raza², Mamoor Arslaan³, Affaf Fatima⁴, Anum Hira⁵, Saira Hamid⁶

ABSTRACT:

Objective: This research was aimed at evaluating the knowledge of transmission, diagnosis, vaccination, and post-exposure prophylaxis of HBV among dental students, dentists and paramedics.

Methodology: A randomized cross-sectional study was conducted at Bahria University Medical & Dental College, Karachi with a sample size of 240 subjects from February to March 2016. Self-administered questionnaires were distributed to assess different parameters regarding knowledge about Hepatitis B infection. Dental students, dentists and paramedic staff participated in the study.

Result: The response rate was 65.8%. Out of 158 individuals, 39(25%) were males and 119(75%) females. The difference in knowledge of males and females was insignificant ($p > 0.01$). The respondents obtained a mean correct answer of 6.94 ± 2.59 out of 17. Dental students obtained mean correct score of 5.84 ± 2.59 , 5.84 ± 2.26 , 7.92 ± 1.91 , 7.35 ± 2.66 in 1st, 2nd, 3rd and final year BDS respectively. The mean score for correct answers in dental professionals was 6.94 ± 2.59 . The knowledge difference among students of 1st, 2nd, 3rd and final year and Faculty/ Paramedic was significant ($p < 0.01$).

Conclusion: The overall awareness regarding hepatitis B infection was found to be lacking. This underlines the need for more emphasis on the said topic in current BDS curriculum and conducting more refresher CDE sessions for dental professionals as an effort to limit the spread of infection.

Key words: Hepatitis B, Post-exposure prophylaxis, Vaccination, Dentists

INTRODUCTION:

Hepatitis B, world's leading liver infection is caused by a double stranded DNA Hepatitis B virus (HBV)¹. From 2 billion people in the world infected with HBV, 400 million are suffering from chronic HBV infection^{1,2}. Pakistan is highly endemic with HBV with 4.5 million infected people and approximately 7-9 million carriers with a carrier rate of 3-5%^{3,4}.

Hepatitis B infection poses a major health concern, since

it is the most common blood borne viral infection. It is 50–100 times more infectious than HIV⁵. It places health care workers, medical, and dental professionals at high occupational risk⁶. The routes of transmission of HBV include un-screened blood transfusion, re-use of contaminated needles/IV drug use, un-sterilized dental/medical instruments, sexual intercourse, and vertical transmission from mother to child during pregnancy⁷.

In dental setting, the most common mode of transmission from infected patient to dentist is through needle stick injuries^{8,9}. However, it may also spread from inoculation of infected blood, saliva, or gingival crevicular fluid on broken skin^{9,10}.

Clinically, Hepatitis B may present as asymptomatic carrier state, acute self-limiting infection or hepatic failure, or chronic hepatitis with progression to cirrhosis, and hepatocellular carcinoma^{11,12}. According to a WHO report of July 2017, an estimated 257 million people are infected with hepatitis B virus (defined as hepatitis B surface antigen positive). Furthermore, hepatitis B resulted in 887 000 deaths, mostly from complications including cirrhosis and hepatocellular carcinoma in 2015.¹³

Numerous studies have been conducted worldwide in order to assess the knowledge of Hepatitis B among health care workers, dental practitioners and dental students. Global literature showed varying degrees of awareness from poor to moderate among the dental students without difference of knowledge according to the gender^{14,15,16}.

The degree of knowledge regarding Hepatitis B increased with successive years of dental programs¹⁷. According to a study published in 2011, health care professionals and general population in some areas of Pakistan had high HBV prevalence, more than 5% and there is an urgent need of mass vaccination and awareness programs⁴. Studies have shown that the risk of exposure for dentists is about three to four times greater than

✉ **Dr. Kulsoom Fatima Rizvi**
Assoc. Prof.
Vice Principal and Head
Community and Preventive Dentistry
Bahria University Medical and Dental College
Karachi

✉ **Dr. Hira Raza**
Senior Lecturer
Department of Oral Biology
Bahria University Medical and Dental College
Karachi.

✉ **Dr. Mamoor Arslaan**
Senior Registrar
Department of Oral Surgery
Bahria University Medical and Dental College
Karachi

✉ **Dr. Affaf Fatima**
House officer
Bahria University Medical and Dental College
Karachi

✉ **Dr. Anum Hira**
House officer
Bahria University Medical and Dental College
Karachi

✉ **Dr. Saira Hamid**
House officer
Bahria University Medical and Dental College
Karachi

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general population as compared to non-immunized surgeons who have about six times higher risk¹⁸. In Pakistan, however, only few researches assessed the extent of knowledge regarding availability of post-exposure prophylaxis¹⁹.

The knowledge of Hepatitis B infection is indispensable for all dental students. They actively participate in community outreach programs in 2nd year BDS, and start working in dental OPD from 3rd year. Thus, they are at a constant risk for contracting HBV. The awareness of paramedic staff regarding HBV also holds prime importance in limiting the spread of disease. The aim of this study was to assess the level of awareness regarding transmission, diagnosis, immunization, and post-exposure prophylaxis of Hepatitis B infection among dental students and professionals; to compare gender differences in knowledge of Hepatitis B infection and to compare differences in knowledge of dental students and professionals.

METHODOLOGY:

This randomized cross-sectional study was conducted at Bahria University Medical & Dental College, Karachi after approval from Ethical Review Committee from February 2016 to March 2016. Self-administered questionnaires were distributed to assess the knowledge regarding diagnosis, transmission, immunization and post-exposure prophylaxis of HBV infection. The sample size was set at 240 subjects by convenience sampling technique. The study population included dental students of BDS 1st, 2nd, 3rd and final year, practicing dentists, dental teaching faculty and paramedics. Participation from subjects was voluntary. Informed consent was obtained from participants.

A modified questionnaire⁵ was distributed among all participants of the study. It was a close-ended self-reported questionnaire having at least three options for every question. The questionnaire consisted of 17 questions regarding diagnosis, transmission, immunization and post-exposure prophylaxis of Hepatitis B infection. A portion was given for the demographics and designation in college. Participants were instructed to use their prior knowledge and take no external help to answer the questions which ensured minimal respondent bias.

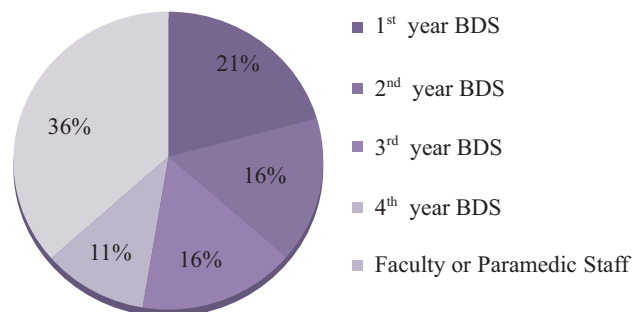
Analysis was performed using SPSS version 16. Frequencies and percentages were calculated for categorical variables like Gender and Year of Study. Mean and standard deviation were calculated for continuous variable like mean knowledge score. A score of “1” was given to every correct answer and “0” for every wrong answer. Independent Samples t test and one way ANOVA were used to compare the mean difference in knowledge score between different groups at 1% level of significance. Post hoc comparisons using Tukey HSD test were then done to verify the results of ANOVA at 5% level of significance.

RESULTS:

A total of 240 questionnaires were distributed, and

158 were received with a response rate of 65.8%. Out of 158 individuals, 39(25%) were males and 119(75%) females. The percentage of students from each class, faculty members and paramedics is shown in Figure-1.

FIGURE-1: Pie Chart Showing Percentage of Study Participants



Males and females scored mean correct answers of 7.15±2.97 and 6.88±2.46 respectively. The comparison of mean score between difference in level of knowledge in males and females was found to be insignificant (Table-1). The mean scores obtained by the students, as well as faculty members and paramedical staff is also shown in Table-1.

Table-1: Knowledge score of participants with respect to the demographic characteristics

| Variable | Mean±SD | P-Value |
|-----------------------------------|-----------|---------|
| | 6.94±2.59 | |
| Gender | | |
| Male | 7.15±2.97 | 0.572 |
| Female | 6.88±2.46 | |
| Year of Study/Profession | | |
| 1st Year | 5.84±2.59 | |
| 2nd Year | 5.84±2.26 | |
| 3rd Year | 7.92±1.91 | |
| 4th Year | 7.35±2.66 | 0.001* |
| Faculty or Paramedic Staff | 6.94±2.59 | *p<0.01 |

The knowledge of participants regarding transmission of HBV, its incubation period, the duration for which HBV can survive outside body, disinfectant recommended for HBV contaminated surfaces, management of needle stick injury, blood test to be done in the patient following a needle stick injury, timing for

HBsAg test, post-exposure prophylaxis in a non-vaccinated individual, dosing schedule for Hepatitis B vaccination, when to check the post-vaccination titre for evaluation of vaccination success, the timing of

booster dose and knowledge about the protocol that should be followed in case the vaccination fails to raise the antibody titre to the required level is shown in table-2.

| Questions | Correct answer | | Incorrect answer |
|--|----------------|--|------------------|
| | N(%) | | N(%) |
| Can HBV be transmitted from an asymptomatic /carrier state? | 108(68.4) | | 50 (31.6) |
| Do you know HBV has 50-100 times higher ability to cause infection than HIV? | 69(43.7) | | 89 (56.3) |
| Is the risk of transmission of HBV through infected blood higher than infected saliva? | 117(74.1) | | 41 (25.9) |
| Is the risk of transmission of HBV through aerosols high? | 59(37.3) | | 99 (62.7) |
| Can HBV transmission occur whilst it is in the incubation period in the body? | 46(29.1) | | 112 (70.9) |
| What is the incubation period of HBV ? | 31(19.6) | | 127 (80.4) |
| For how long can HBV survive outside the body? | 36(22.8) | | 122 (77.2) |
| What is the recommended disinfectant for cleaning environment surfaces after a blood spill? | 52 (32.9) | | 106 (67.1) |
| After a needle stick injury, what is the first measure a dentist should take? | 86 (54.4) | | 72 (45.6) |
| In case of needle stick injury to a dentist, which blood test should be done in the patient who was being treated? | 71(44.9) | | 87 (55.1) |
| In case of needle stick injury to dentist, for how long should he wait to get blood tested for detection of HBV surface Antigen? | 40(25.3) | | 118 (74.7) |
| If an unvaccinated individual is exposed to HBV, what should be the prophylaxis? | 49 (31) | | 109 (69) |
| Is it necessary to get immunized against HBV even if proper infection control and sterilization are carried out? | 135(85.4) | | 23 (14.6) |
| What is the ideal dosing schedule of Hepatitis B vaccination? | 61 (38.6) | | 97 (61.4) |
| When should post-vaccination antibody titer (body response to vaccine) should be checked? | 44(27.8) | | 114(72.2) |
| If an individual does not respond to initial vaccination course, what should be done? | 94 (59.5) | | 64 (40.5) |
| When is a booster dose required as per WHO criteria? | 49 (31) | | 109 (69) |

The mean score for overall sample was found to be statistically significant, as an analysis of variance (ANOVA) yielded significant knowledge difference

among students of 1st year, 2nd year, 3rd year, final year and Faculty/ Paramedic (Table-3).

Table-3: Diifference in Knowledge between and among the groups determined by ANOVA

| T-SCORE | ANOVA | | | | |
|----------------|----------------|-----|-------------|-------|------|
| Between Groups | Sum of Squares | df | Mean Square | F | Sig. |
| Within Groups | 115.787 | 4 | 28.947 | 4.703 | .001 |
| Total | 941.808 | 153 | 6.156 | | |
| | 1057.595 | 157 | | | |

Post hoc comparisons using the Tukey HSD test indicated that the knowledge score of First year and 2nd year students significantly differed from students of 3rd year (p<0.05) and Faculty/ Paramedic (p<0.05). However,

the difference in knowledge score of Final year students as compared to other groups was not statistically significant (Table-4)

Table-4
Post hoc comparisons using Tukey HSD test indicating the differences in knowledge between respondents.
Multiple Comparisons

Dependent Variable: TSCORE
Tukey HSD

| (I) Year | (J) Year | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|----------------------------|----------------------------|-----------------------|------------|-------|-------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| 1st Year | 2nd Year | .00848 | .65784 | 1.000 | -1.8075 | 1.8245 |
| | 3rd Year | -2.07152* | .65784 | .017 | -3.8875 | -.2555 |
| | 4th Year | -1.50446 | .74069 | .256 | -3.5492 | .5403 |
| | Faculty or Paramedic Staff | -1.66876* | .54098 | .020 | -3.1622 | -.1753 |
| 2nd Year | 1st Year | -.00848 | .65784 | 1.000 | -1.8245 | 1.8075 |
| | 3rd Year | -2.08000* | .70175 | .029 | -4.0172 | -.1428 |
| | 4th Year | -1.51294 | .77995 | .301 | -3.6661 | .6402 |
| | Faculty or Paramedic Staff | -1.67724* | .59360 | .042 | -3.3159 | -.0386 |
| 3rd Year | 1st Year | 2.07152* | .65784 | .017 | .2555 | 3.8875 |
| | 2nd Year | 2.08000* | .70175 | .029 | .1428 | 4.0172 |
| | 4th Year | .56706 | .77995 | .950 | -1.5861 | 2.7202 |
| | Faculty or Paramedic Staff | .40276 | .59360 | .961 | -1.2359 | -2.0414 |
| 4th Year | 1st Year | 1.50446 | .74069 | .256 | -.5403 | 3.5492 |
| | 2nd Year | 1.51294 | .77995 | .301 | -.6402 | 3.6661 |
| | 3rd Year | -.56706 | .77995 | .950 | -2.7202 | 1.5861 |
| | Faculty or Paramedic Staff | -.16430 | .68427 | .999 | -2.0533 | 1.7247 |
| Faculty or Paramedic Staff | 1st Year | 1.66876* | .54098 | .020 | .1753 | 3.1622 |
| | 2nd Year | 1.67724* | .59360 | .042 | .0386 | 3.3159 |
| | 3rd Year | -.40276 | .59360 | .961 | -2.0414 | 1.2359 |
| | 4th Year | .16430 | .68427 | .999 | -1.7247 | 2.0533 |

*.The mean difference is significant at the .05 level.

DISCUSSION:

A multitude of researches can be found on knowledge, attitude and practices regarding Hepatitis B infection in medical students, health care workers and general public. Few studies have been designed solely on the assessment of dental students' knowledge on this important disease. Although many studies have been done in our region but these were inconclusive because of varying results, which could be explained by cultural diversity and lack of uniform educational system.

The mean knowledge score was analyzed to be poor since the subjects were able to answer approximately 6 questions correctly out of 17 questions. This was similar to the study conducted in Iran where mean score was 14.3 out of 44²⁰. The results also concur with study in India where only 59.7% were aware of the HBV infection⁵ and in Iraq where only 41% had the knowledge

regarding HBV infection²¹. Moreover, a study on medical students in Karachi to evaluate knowledge, attitude and practice regarding Hepatitis B concluded the results to be significantly low (57.1%), at par with our knowledge score²². Another study in Sudan showed that students had poor knowledge and awareness, particularly about HBV compared to AIDS²³. Other studies speculate on the findings which indicated moderate to good knowledge²⁴. In a study conducted by Sain et al, results showed 81.55% and 94% were correct on their knowledge about transmission and vaccination²⁵. Another study in Iran presented a mean knowledge score of 51.45 ± 3.16(out of 63) which indicated good knowledge¹⁵. Another study had results similar to our conclusion²⁶. Three questions in the questionnaire were formulated to assess the knowledge on transmission, and they were answered with variegating responses. The subjects

possessed a fairly good knowledge for the transmission in carrier state and via infected blood but were largely unaware that the HBV can be transmitted in its incubation period²⁶. A study by Shigri et al also observed the lack of knowledge regarding transmission in incubation period²⁷.

The relationship between year of study and level of knowledge was found to be significant which suggested that the first year had poor knowledge as compared to third and final year BDS. This can be explained by the incorporation of topics related to viral infections in the curriculum and more clinical exposure in later years. This was in line with a study done on 300 medical students in Lahore Medical and Dental College²⁸ which suggested that with successive years of dental education, the knowledge increased. In our study, the knowledge score of Faculty and Paramedic staff was lower than that of dental students. The low score could be attributed to grouping paramedic staff with dentists, as former are usually less qualified in our country. Another study²⁹ showed insufficient knowledge in auxiliary and paramedic staff. This emphasized the rationale of this study which was to arrange continuing educational programs for dental students, dentists and paramedic staff, crucial to reinforce personal protection, vaccination, and post-exposure prophylaxis protocols in the dental setting. The questions related to immunization, prophylaxis, and booster dose were not answered satisfactorily. A study by Gayathri et al³⁰ also pointed out the misconceptions in the sample population related to vaccination, prophylaxis and treatment of HBV. A study in Nigeria³¹ explained that the respondents had good basic knowledge of HBV infection owing to the awareness programs organized by different authorities but lacked deeper knowledge and understanding regarding HBV infection and HBV immunology. The limitations of our research were the lack of inclusion of proper assessment tools for evaluating the practice of infection control protocols among dental students, low sample size and response rate. The merging of paramedical staff with dentists might have also affected the knowledge score as the former group in Pakistan mostly does not receive formal degree in the field.

CONCLUSION:

The overall awareness regarding hepatitis B infection was found to be lacking. This underlines the need for putting more emphasis on the said topic in current BDS curriculum and conducting more refresher CDE sessions for dental professionals as an effort to limit the spread of infection.

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CONFLICT OF INTEREST:

There was no conflict of interest.

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